Index

YEAR XIII, NUMBER 39, August 2008

de Menezes, A. G. *Vieira, J. C.*	Willingness to pay for airline services attributes: evidence from a stated preferences choice game	1
Geerlings, H. *van der Sluis - van Meijeren, M.*	The dominance of the Lisbon agreement as a barrier for an environmentally oriented transport policy in Europe; the gap between theory and implementation in policy integration	14
Beneš, L. *Březina, E.* *Bulìček, J.* *Mojžiš, V.*	The Development of Transport in the Czech Republic	33
Baccelli, O. *Percoco, M.* *Tedeschi, A.*	Port Authorities as cluster managers: the case of the Ligurian ports	44
Massiani, J. *Rosato, P.*	Using conjoint analysis to investigate preferences of inhabitants for the future of a greyfield area: an application to the Old Port in Trieste	59

European Transport \ Trasporti Europei n. 39 (2008): 1-13

Willingness to pay for airline services attributes: evidence from a stated preferences choice game

A. G. de Menezes [1*], J. C. Vieira [1]

[1] University of the Azores
Department of Economics and Management and CEEAplA
Rua da Mãe de Deus, 9501-801 Ponta Delgada, Portugal

Abstract

We analyze consumer preferences for airline service attributes between Ponta Delgada and Lisbon: the most important air corridor between the Azores and Mainland Portugal. Owing to stringent regulations, which fall under the European Union Public Service Obligations (PSOs) domain, there are no revealed preferences data suitable to study consumer preferences. Hence, we conduct a stated preferences choice game and estimate a microeconometric model à la McFadden. Our results are statistically significant and imply willingness to pay measures economically high for attributes such as punctuality warranties and comfort. Willingness to pay for additional daily flights is quite low. This result is important to how should the policy maker liberalize this sector.

Keywords: Stated Preferences Choice Games, Conditional Logit, Willingness to Pay, Airline Services, Public Service Obligations.

---

1. Introduction

We analyze consumer preferences for airline service attributes between Ponta Delgada and Lisbon: the most important air corridor between the Azores and Mainland Portugal. Owing to stringent regulations, which fall under the European Union Public Service Obligations (PSOs) domain, there are no revealed preferences data suitable to study consumer preferences. Hence, we conduct a stated preferences choice game and estimate a microeconometric model à la McFadden (1974).

We note that our methodology is agnostic with respect to the geographical place of its implementation. However, we do have good reasons to focus our attention in the Ponta Delgada – Lisbon corridor: as we argue below, on the one hand, stated preferences data come especially handy, as there are no revealed preferences data, and, on the other hand, policy guidance is much needed.

---

* Corresponding author: António Gomes de Menezes (menezesa@notes.uac.pt)

The Azores are a Portuguese archipelago, with an autonomous government, in the North Atlantic, about two hours by flight west of Lisbon, with roughly the same latitude (36º) as Lisbon and New York. The Azores have a disperse and small territory, with nine inhabited islands, within 600 kilometers apart, with a total surface of 2.333 km² and a population of 241.000 inhabitants. Ponta Delgada is the main city of the Azores, in the island of São Miguel, the largest and richest island in the Azores.

Given its geography and population, it should come as no surprise that airline services are commonly perceived as critical to the economic development and to the social cohesion of the Azores. Thus, there has been heavy governmental regulation in the airline services sector on, at least, two counts: (i) On equity grounds, inter-island mobility and equal access to other regions regardless of island of origin are politically understood as necessary to the social cohesion of the Azores. Hence, inter-island mobility is and has been treated as a public service obligation (on this, more below). SATA – the Azorean flag carrier, owned by the Azorean Government – provides and has provided such service as a monopolist operating under stringent regulations, regarding fares, flight capacity, and flight frequencies, among other service attributes. (ii) On efficiency grounds, due to an arguably lacking demand, on the one hand, and high capital and operating costs, on the other, airline services are and have been thought of as a natural monopoly.

Under these arguments, there has never been an open skies policy in the Azores. Nowadays, the Azorean Government enforces stringent regulations on air transportation, which is allowed in the European Union within the framework of Article 4 of Council Regulation 2408/92. In fact, until 2004 only one airline at a time flew between a given Azorean gateway and Mainland Portugal. Since 2005, two airlines – SATA and TAP (the Portuguese flag carrier, owned by the Portuguese Government) – operate our route of interest, Ponta Delgada – Lisbon, via a code share agreement, as the sole and joint concessionaires of air transportation services between the Azores and Mainland Portugal.

However, both SATA and TAP are obliged to follow a stringent set of regulations regarding several dimensions of their services, including fares, flight frequencies, flight capacities, and punctuality warranties and so on.[1] In essence, both SATA and TAP have to implement twin operation strategies and procedures, with virtually no degrees of freedom whatsoever. Therefore, there are no revealed preferences data that can shed light on consumer preferences. Hence, we implement a stated preferences choice game and estimate a discrete choice model à la McFadden (1974) in order to learn about consumer preferences, and, concomitantly, provide useful information for policymakers and operators alike.

We resort to a stated preferences choice game and associated discrete choice model since with this methodology, and to be brief, airline customers are asked to choose between competing alternatives that differ, in a trade-off sense, in several service attributes. Hence, our choice-based approach is based on a quite realistic task that airline customers perform every day. In addition, our willingness to pay measures are consistent with utility theory (see Merino-Castelló, 2003, and Hanley et al., 2001, for extensive discussions on stated preference discrete choice models and the reasons behind the growing popularity of such models).

---

[1] See Official Journal of the European Union, 2004/C 248/06, 7.10.2004 (http://europa.eu.int/eur-lex/lex/JOIndex.do?), the European Union policy directive that regulates flights between the Azores and Mainland Portugal.

Several authors have successfully applied discrete choice models to transportation policy issues in a number of ways and settings (see, among others, Ben-Akiya and Lerman, 1985, Wardman, 1988, for surveys, and Burris and Pendalya, 2002, and Rudel, 2005, for applications). Cao and Mokhtarian (2005a, 2005b) argue that individuals adapt their travel-related strategies according to a number of objective and subjective influences, and, hence, one should consider individual experiences and characteristics when forecasting the expected outcome of a given policy choice. We follow this reasoning and control in our empirical exercise for a number of individual characteristics.

The evidence that we provide also sheds light on consumer preferences towards flight frequency. Thus, we can use this evidence as an input in the debate if we are indeed in the presence of a natural monopoly or not. Hence, our paper contributes to the literature on the application of Public Service Obligations (PSOs) in air transport within the European Union. As Williams and Pagliari (2004) argue, despite the widespread application of PSOs across the European Union, with the aim of promoting sustainable air services to remote regions for economic development purposes, as is the Azorean case, there is very little research on the routes operated under the PSO umbrella. Our paper employs a stated preference discrete choice exercise that elicits consumer preferences and, thus, provides interesting demand side information that may be used in the design of the above mentioned PSOs regulations and corresponding consumer welfare implications.

The paper is organized as follows. Section 2 describes the data. Section 3 presents our econometric model. Section 4 discusses the results. Section 5 concludes.

2. Data

2.1. The Sated Preferences Choice Game

Our stated preferences choice game was implemented through questionnaires ministered at Ponta Delgada's Airport, near the boarding gate, after security checkpoint. A total of 347 questionnaires were asked from April 27th to May 5th of 2005. The number of questionnaires ensures a number of observations large enough to estimate the econometric model described below. The interviews were conducted in Portuguese.

Only people who were about to take a flight from Ponta Delgada to Lisbon were interviewed, to make sure that they were familiar with the questions asked. Moreover, people who were traveling with tourist packages, namely, packages with a combination of hotel, air travel, rent a car, and so on, were not considered since these people did not have a clear idea of the exact cost of the air travel portion of their travel package.

The questionnaires had 3 sections. In the first section, a number of questions were asked about the trip, such as: airline; connection at destination; connecting airline; fare class (business, economy); departure time; trip cost; trip motive; trip frequency; who pays for the trip; number of people flying with the interviewee; advance of purchasing the ticket; mode of purchasing the ticket; and frequent flyer program.

In the second section, the individuals were confronted with a stated preferences choice game. In particular, with the aid of a laptop computer, the individuals were asked to choose one of two virtual airlines that differed in the following dimensions, based, on the one hand, on the status quo,[2] and, on the other, on what we observe elsewhere, namely, in more deregulated and competitive markets:

Attribute	Level	Definition	
Price	0	P + 20%	
	1	P	
	2	P - 20%	
Penaly for changes in the ticket		Business	Cheap Fare
	0	30%	100%
	1	10%	50%
	2	0%	30%
Free Food		Business	Cheap Fare
	0	Cold sandwiches + drink	Not available
	1	Hot food + drink	Cold sandwiches + drink
	2	A la carta (when buying the ticket)	Hot food + drink
Comfort	0	Small space between seats	
	1	Wide space between seats	
Frequency	0	2 flights / day	
	1	4 flights / day	
	2	6 flights / day	
Reliability	0	No compensation for delay	
	1	Free ticket for the same trip	
	2	Reimbursement of the cost of the ticket	

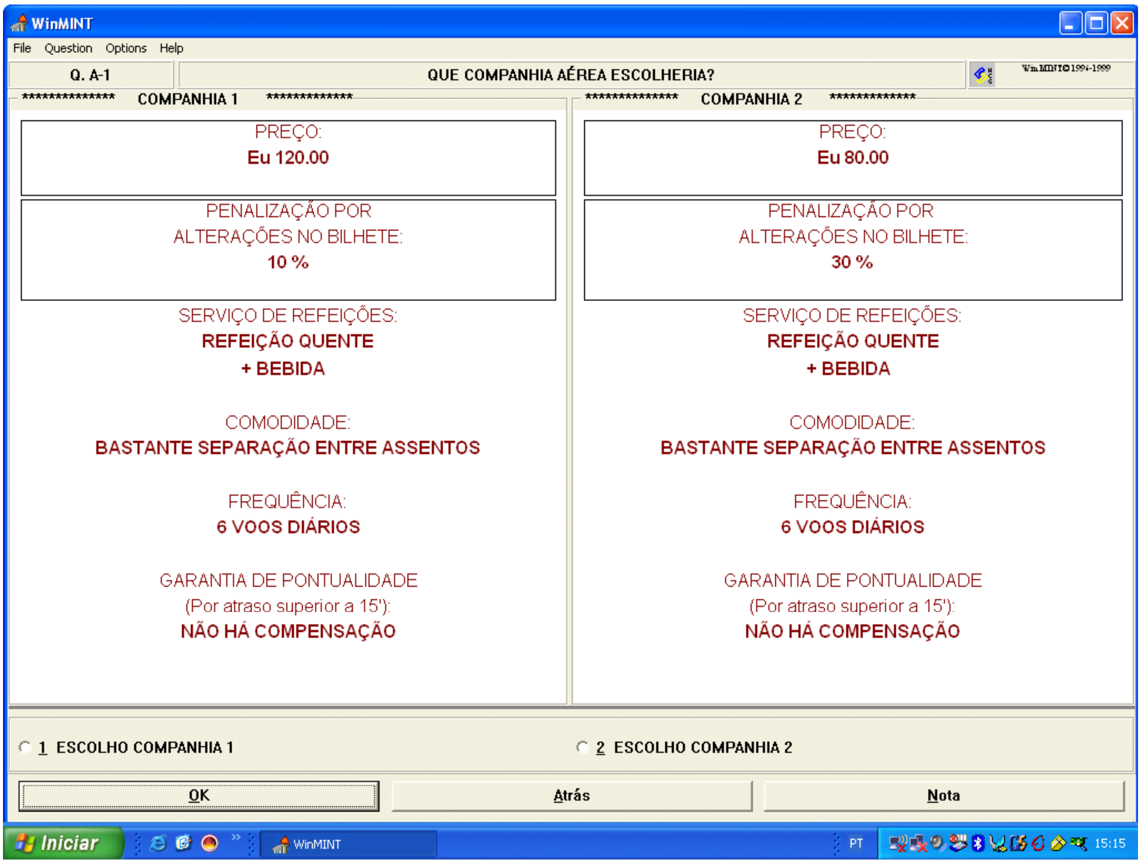
Figure 1: Service Attributes and Levels

Other attributes which we may care about were left out of the game in order to preserve a good understanding of the trade-offs involved (see Sudman and Bradburn, 1982, for practical issues on questionnaire design). As a corollary, travel time was left out since it is, to a great extent, exogenous both to the operator and to the regulator.

The following picture is a "Print Screen" of WinMint v. 2.1 (in Portuguese), the software used to randomly generate the game menus:

---

[2] The status quo, and to be brief, entails: two fares, economy and business; no penalty to change tickets within a year; cold sandwiches if economy, hot food if business; small space between seats for both fares; two flights per day; and no compensation for delay.



Q. A-1 QUE COMPANHIA AÉREA ESCOLHERIA?

*************** COMPANHIA 1 *************	*************** COMPANHIA 2 *************
PREÇO: Eu 120.00	PREÇO: Eu 80.00
PENALIZAÇÃO POR ALTERAÇÕES NO BILHETE: 10 %	PENALIZAÇÃO POR ALTERAÇÕES NO BILHETE: 30 %
SERVIÇO DE REFEIÇÕES: REFEIÇÃO QUENTE + BEBIDA	SERVIÇO DE REFEIÇÕES: REFEIÇÃO QUENTE + BEBIDA
COMODIDADE: BASTANTE SEPARAÇÃO ENTRE ASSENTOS	COMODIDADE: BASTANTE SEPARAÇÃO ENTRE ASSENTOS
FREQUÊNCIA: 6 VOOS DIÁRIOS	FREQUÊNCIA: 6 VOOS DIÁRIOS
GARANTIA DE PONTUALIDADE (Por atraso superior a 15'): NÃO HÁ COMPENSAÇÃO	GARANTIA DE PONTUALIDADE (Por atraso superior a 15'): NÃO HÁ COMPENSAÇÃO

○ 1 ESCOLHO COMPANHIA 1
○ 2 ESCOLHO COMPANHIA 2

Figure 2: Print Screen

In essence, the stated preferences choice game presented the passengers with a choice between two virtual airlines, none of which dominated the other in all dimensions, as expected. That is, all games considered had trade-offs built-in. Each individual played the game 10 times.

In the third and last section, the individuals were asked about their socioeconomic status, such as: residence county; number of people living in the household; number of workers in the household; household income; age; gender; educational attainment; sector of occupation; type of job; weekly working hours and net monthly individual income.

2.2. Descriptive Statistics

Table 1 summarizes some of the continuous variables in the data set:

Table 1: Descriptive statistics

Variable	*Observations*	*Mean*	*S. Deviation*	*Minimum*	*Maximum*
Trip cost (€)	347	122,37	37,98	-	250,00
Net household monthly income (€)	347	2.645,08	1.679,55	150,00	12.500,00
Weekly working hours (hours)	347	18,80	13,10	0,00	60,00
Net individual monthly income (€)	347	1.196,04	1.325,54	0,00	10.000,00
Age (years)	347	36,53	13,57	19,00	85,00

Mean reported one way ticket cost is € 122. In addition, we note that most interviewees flew with SATA, in a domestic flight with no connection and were males. Most interviewees, 67%, bought the tickets with one week or less in advance of departure day. The travel agency was the mode of purchasing ticket chosen by 69% of the individuals. While 50% of the interviewees paid for their tickets, 35% of the interviewees had their tickets paid for their companies. A slight majority, 51%, of the interviewees had some sort of frequent flyer program. Perhaps not surprisingly, many interviewees held a university degree, 51%, since being at the boarding gate is not a random event across the overall Portuguese population.

3. The Econometric Model and Willingness to Pay Measures

The econometric work carried out in the paper is based on the random utility theory (see McFadden 1974, Greene, 2003, or Train, 2003), briefly described below. The random utility of alternative *j* for an individual *n*, U_{jn}, is given by:

$$U_{jn} = V_{jn} + \varepsilon_{jn} \qquad (1)$$

V_{jn} is the systematic or representative utility (conditional indirect utility) and ε_{jn} is a random term.

Individual *n* chooses alternative *j* if and only if $U_{jn} \geq U_{in}$, $\forall\ i \neq j$. In such a case, and given (1):

$$V_{jn} + \varepsilon_{jn} \geq V_{in} + \varepsilon_{in} \Leftrightarrow \varepsilon_{in} - \varepsilon_{jn} \leq V_{jn} - V_{in}, \quad \forall_{j \neq i}$$

As utilities are random variables, we can obtain the probability that individual *n* chooses alternative *j* as:

$$P_{jn} = P(\varepsilon_{in} - \varepsilon_{jn} \leq V_{jn} - V_{in}) \quad \forall_{j \neq i} \qquad (2)$$

When the random term ε_{jn} follows a Gumbel distribution, P_{jn} reads (see McFadden, 1973):

$$P_{jn} = \frac{e^{V_{jn}}}{\sum_{i=1}^{N} e^{V_{in}}} \qquad (3)$$

N is the number of alternatives. The expression for P_{jn} given by (3) is the essence of the well-known multinomial logit model.

We estimate a conditional logit model, since we have several observations (games) per individual, and, hence, we control for individual fixed effects. The estimation was carried out with STATA Intercooled 8. As usual in the literature (Bateman et al., 2002, Espíno et al., 2003, Fowkes and Wardman, 1998, Fowkes, 2000, and Louviére et al., 2000), we estimate two alternative specifications of the conditional indirect utility, Model 1 and Model 2, described below.

In Model 1 we do not consider interactions between attributes and the conditional indirect utility reads:

$$\begin{aligned} V_j &= \theta_C C + \theta_P P + \theta_{F_1} F_1 + \theta_{F_2} F_2 + \\ &+ \theta_{LR} LR + \theta_{F_R} F_R + \theta_{R_1} R_1 + \theta_{R_2} R_2 \, , \; j = 1{,}2 \end{aligned} \tag{4}$$

In Model 2 we consider interactions between attributes, and, hence, we write the conditional indirect utility as follows:

$$\begin{aligned} V_j &= \theta_C C + (\theta_P + \theta_{PW} W) P + \\ &+ (\theta_{F_1} + \theta_{F_1 E_C} Ec) F_1 + (\theta_{F_2} + \theta_{F_2 E_C} Ec) F_2 + \\ &+ \theta_{LR} LR + \theta_{F_R} F_R + \\ &+ (\theta_{R_1} + \theta_{R_1 W} W) R_1 + (\theta_{R_2} + \theta_{R_2 W} W) R_2 \, , \; j = 1{,}2 \end{aligned} \tag{5}$$

Table 2 provides a list with variables' definitions:

Table 2: Variables' definitions

Variable	*Meaning*
C	travel cost (Euros)
P	penalty for changes in the ticket
F_1	binary variable equal to 1 if food level equals 1
F_2	binary variable equal to 1 if food level equals 2
LR	binary variable equal to 1 if comfort (more leg room) is 1
Fr	daily flight frequency (continuous variable)
R_1	binary variable equal to 1 if reliability level equals 1
R_2	binary variable equal to 1 if reliability level equals 2
Ec	binary variable equal to 1 if fare is economy
W	binary variable equal to 1 if trip motive is work

After estimation of the models above, it is possible to compute the willingness to pay (WTP) for improvements in service attributes. For continuous variables the subjective value of attribute *q* reads:

$$WTP_q = -\frac{\dfrac{\partial V}{\partial q}}{\dfrac{\partial V}{\partial I}} = \frac{\dfrac{\partial V}{\partial q}}{\dfrac{\partial V}{\partial c}} = -\frac{dc}{dq}$$

I stands for income, c for (monetary) cost and $\frac{\partial V}{\partial I} = -\frac{\partial V}{\partial c}$. Intuitively, WTP is given by the appropriate slope of the conditional indirect utility. For binary variables the relevant expression is as follows:

$$WTP_q = \frac{V^1 - V^0}{\frac{\partial V}{\partial I}}$$

V^i is the conditional indirect utility when the level of the attribute equals i=0,1.

4. Empirical results and discussion

4.1. Empirical results

Table 3 summarizes the results for models 1 and 2. The signs are as expected and the estimates are statistically significant, with the notable exception of the interaction terms. Adding the interaction terms seems to matter little, both at a qualitative level and at a quantitative level.

Table 3: Estimation Results for Model 1 and Model 2

Variable	*Model 1*	*Model 2*
Cost (θ_C)	-0.0251 * (-18.02)	-0.0252 * (-18.04)
Penalty (θ_P)	-0.0140 * (-6.97)	-0.0138 * (-5.79)
Food 1 (θ_{F1})	0.2505 * (3.77)	0.7208 * (2.86)
Food 2 (θ_{F2})	0.4403 * (6.24)	0.8944 * (3.83)
Leg Room (θ_{LR})	0.5123 * (8.98)	0.5135 * (8.99)
Frequency (θ_{Fr})	0.1266 * (7.09)	0.1279 * (7.15)
Reliability 1 (θ_{R1})	0.9894 * (14.68)	0.9868 * (11.46)
Reliability 2 (θ_{R2})	0.8294 * (11.66)	0.8667 * (11.46)
Food 1*Economy (θ_{F1Ec})		-0.5005 *** (-1.93)
Food 2*Economy (θ_{F2Ec})		-0.4828 ** (-2.03)
Penalty*Work (θ_{PW})		-0.0009 * (-0.23)
Reliability 1+Work (θ_{R1W})		0.0174 * (0.13)
Reliability 2*Work (θ_{R2W})		-0.0849 * (-0.70)
Log – L (θ)	-3959	-3956
Log – L (0)	-4207	-4207
Number of observations	6940	6940

Note: * 1%; ** 5%;*** 10%

In order to obtain a feel of the economic importance of these results we compute the willingness to pay measures, presented in Tables 4 and 5.

Table 4: Willingness to Pay Measures for Model 1

WTP – Model 1	
Event	*WTP (Euros)*
Penalty for changes in the ticket	0.57
Food: level 0 to level 1	9.97
Food: level 0 to level 2	17.52
Comfort (more leg room)	20.39
Frequency	5.04
Reliability: level 0 to level 1	39.39
Reliability: level 0 to level 2	33.02

Given that the sample mean cost of a one way ticket is about € 122, we find that willingness to pay measures are quite high in an economic sense. In particular, the willingness to pay to improve reliability from level 0 to 1 is about € 39 or 32% of the sample mean of the reported one way ticket cost. Apparently, comfort is quite valuable: the willingness to pay to have some more leg room is more than € 20.

Willingness to pay measures do not change substantially when we consider interactions between trip attributes (Model 2):

Table 5: Willingness to Pay Measures for Model 2

WTP – Model 2	
Event	*WTP (Euros)*
Penalty for changes in the ticket	
Trip motive: work/businnes	0.58
Trip motive: other	0.55
Food: level 0 to level 1	
Economy class	8.74
Other type of fare	28.59
Food: level 0 to level 2	
Economy class	16.33
Other type of fare	35.48
Comfort (more leg room)	20.37
Frequency	5.08
Reliability: level 0 to level 1	
Trip motive: work/businnes	39.83
Trip motive: other	39.14
Reliability: level 0 to level 2	
Trip motive: work/businnes	31.01
Trip motive: other	34.38

We note that the willingness to pay for one additional flight per day is about 5 Euros. Hence, the subjective value of increased daily flight frequency is far less, in an economic sense, than the subjective value of improvement in attributes such as reliability or comfort.

4.2. Discussion

In this section, we capitalize on the wealth of individual socio-demographic information gathered in our questionnaire in order to assess if consumer preferences vary in a systematic way across consumer groups. Cao and Mokhtarian (2005a, 2005b) argue that individual specific characteristics influence travel strategies, and, therefore, may influence willingness to pay measures. In our exercise we are able to study if there is systematic and statistically significant variation in the determinants of airline choice across consumer groups as our dataset has a plethora of individual socio-demographic information.

A rather obvious way of distinguishing between different consumer groups is to consider the motive of the trip. In our questionnaire, we considered five different trip motives: (1) work; (2) leisure; (3) studies; (4) family; and (5) other. Individuals who were traveling for work related reasons are the largest group in the sample (41.5%). Individuals who were traveling for leisure are the second largest group in the sample (32.5%). Finally, individuals who were traveling due to their studies or to visit their families comprise 5.7% and 9.2% of the sample, respectively. Hence, work and leisure are by far the most important self-reported trip motives in our sample and we focus on them. To investigate if willingness to pay measures vary with trip motive in a significant way, we split the sample and estimate both Model 1 and Model 2 for the subsamples of interest. To save on space, below we report our results for Model 1 only. The coefficients obtained for the sample of persons who were travelling for work related reasons are remarkably similar to the coefficients obtained for the sample of persons who were not travelling for work related reasons (and for the overall sample). In fact, and focusing on Model 1, a log-likelihood ratio test fails to reject that the coefficients obtained for the sample of persons traveling for work related reasons are not jointly statistically different from the coefficients obtained for the sample of individuals who were not travelling for work related reasons. To be more precise, the log-likelihood ratio test obtains the value of 12.2438 whereas the critical values for the relevant Chi-squared are 13.36, 15.51, and 20.09 at the 10%, 5% and 1% significance levels, respectively. Hence, it comes as no surprise that the willingness to pay measures do not vary much in an economic sense for these two groups of consumers. Nevertheless, we do note that persons who were not travelling for work related reasons do exhibit slightly lower willingness to pay measures to experience improvements in airline service attributes considered in the stated choice game. By the same token, we split the sample according to the trip motive leisure and, thus, we distinguish between leisure and non-leisure. Once more, the coefficients are remarkably similar across subsamples and a log-likelihood ratio test fails to reject the null hypothesis that the coefficients are not jointly statistically different. In fact, the log-likelihood ratio test is 5.5428, well below the critical values at the usual significance levels.

As employment status is a likely determinant of willingness to pay to experience an improvement in airline services, we use the information in our dataset regarding weekly hours worked. About 26% of the individuals in the sample report zero hours of work per week and mean weekly hours of work for the overall sample is, quite naturally, as low as 18. As quite a few interviewees reported working only a few hours of work per week or none at all, we define fulltime workers as those who work at least 20 hours per week. According to this criterion, fulltime workers comprise 64% of the sample. We estimate Model 1 for the subsamples of fulltime workers and non fulltime workers. A log-likelihood ratio test (24.82) strongly rejects that the coefficients do not jointly differ across employment status even at the 1% significance level. Perhaps as expected, willingness to pay measures are higher for fulltime workers than for non fulltime workers (with the exception of willingness to pay to experience an improvement from food level 0 – no food – to food level 2 – hot food). Willingness to pay for more comfort (leg room) is € 27.77 for fulltime workers and € 12.73 for non fulltime workers. Quite interestingly, willingness to pay for an additional daily flight is € 6.40 for fulltime workers and less than half of this value or € 3.09 for non fulltime workers. It should be noted that in unreported regressions we find that the above mentioned results are robust to alternative definitions of fulltime work.

Finally, we note that willingness to pay measures for an additional daily flight are quite similar across the different consumer groups considered, which took into account trip motive and employment status and frequent flier experience. In fact, according to Model 1, willingness to pay measures for an additional daily flight range from as low as € 3.09 for non fulltime workers (persons who work less than 20 hours of work per week, including persons who do not work at all) to € 6.40 and € 6.59 for fulltime workers and individuals who reported to be travelling for work related reasons. In order to assess if willingness to pay for an additional flight varies with the number of daily flights, we estimate a modified version of Model 2 which, in its essence, allows for a decreasing marginal value of daily flight frequency. In particular, we include as a covariate the product of frequency and an indicator variable that flags cases where flight frequency is the highest or 6 flights per day. Under the PSOs regulations, SATA and TAP must operate at least one flight per day between Ponta Delgada and Lisbon. However, in practice, there are at least two flights per day year round and in the Summer time – when tourism demand for the Azores peaks – there are three or more flights per day but hardly ever six. Hence, in our stated choice exercise we allow daily flight frequency to range from 2 to 6. Perhaps as expected, we find a decreasing marginal value of additional daily flights. When daily flight is already as high as 6 then willingness to pay for an additional daily flight decreases from € 7.18 to € 5.76. The interaction term introduced to allow a non-constant marginal value of additional daily flights is statistically significant at the 5% significance level.

5. Conclusions

The McFadden Discrete Choice Model is an informative tool about consumer preferences over different service attributes across competing alternatives, especially in environments where revealed preferences do not take us far. Obviously, this is the case of airline services in the Ponta Delgada – Lisbon corridor, where air transport is regulated as a Public Service Obligation (PSO) within the European Union legal framework, and there are no data which can be used in a revealed preferences exercise. Thus, a stated preferences exercise was conducted to reveal consumer preferences. Policymakers and operators alike may use this information on consumer preferences in their service design strategies in their quest to promote consumer welfare.

The main results were as expected from utility theory and some willingness to pay measures are quite high, in an economic sense, such as regarding punctuality (reliability) and comfort. However, some other willingness to pay measures were found to be revealingly low. This is the case of willingness to pay for increases in daily flight frequency: about 5 Euros. Willingness to pay for additional daily flights is remarkably similar across the different consumer groups considered, taking into account, namely, trip motive and employment status. However, it should be noted that the data suggest that willingness to pay for an additional daily flight decreases with daily flight frequency. The low willingness to pay for additional daily flight result is somewhat puzzling considering that the Ponta Delgada – Lisbon corridor is the most important corridor servicing the Azores and that quite often flights are fully booked and waiting lists several day long. Taken at face value, this anecdotal evidence on waiting lists suggests that flight frequency is a binding constraint and that passengers would be willing to pay a sizeable amount to have such constraint relaxed. It turns out not to be the case. In unreported regressions, we find no interesting differences with respect to willingness to pay for an additional daily flight for those persons who fly frequently between Ponta Delgada and Lisbon (at least once a year) and for non frequent fliers (those persons who never travelled before or travel less than once a year).

Instead, our result suggests that passengers do not perceive flight availability as a bidding constraint. In addition, this result should be upward biased in the sense that we did not interview a random sample of the population but people who were actually flying, and, hence, everything else the same, more willing to pay for increased flight availability. However, it should be noted that this result does not imply that there is no demand for extra flights. It is logically coherent with a scenario of a highly elastic demand. It simply suggests that there is no demand for more flights at increased cost. But there may be demand for more flights at given or lower prices.

We also note that this result may be influenced by the interviewee's own judgment about his ability to secure a flight through, say, his own planning in advance. As Kahneman (2003) argues, individuals, in general, are prone to over estimate their own ability in a number of settings due to overconfidence. Overconfidence is well documented in many contexts and bears interesting efficiency implications (Kahneman, 2003). It is also quite interesting to note that the willingness to pay for avoiding penalties for changing tickets is quite low: less than one Euro. Pereira et al (2005) find similar results to ours to the Funchal (Madeira, to Portugal) – Lisbon route. Like us, in their study willingness to pay measures seem lower for attributes arguably perceived as endogenous from the interviewee's perspective, in the sense that the interviewee may believe that he may act in a way to avoid penalties, secure flights and so on. By the same reasoning, willingness to pay measures for experiencing improvements in service attributes largely perceived exogenous by the passengers, such as leg room, food service on board and company policy regarding punctuality warranties, are economically substantial when compared to the fares actually paid. An interesting line for future research ought to investigate if indeed stated preferences based willingness to pay measures for service attributes are influenced by overconfidence from the part of passengers.

Airline regulators and operators alike should take heed of these results to root their policies and operations in deep, structural consumer preferences parameters.

References

Bateman et al., (2002) *Economic valuation with stated preferences techniques: a manual*, UK Department of Transport. Edward Elgar Publishing Inc.

Ben-Akiya, M., Lerman, S., (1985) *Discrete choice analysis: Theory and application to travel demand*, The MIT Press, Cambridge, MA.

Burris, M., Pendalya, R., (2002) "Discrete choice models of traveler participation in differential time of day pricing programs", *Transportation Policy* 9: 241-251.

Cao, X., Mokhtarian, P., (2005a) "How do individuals adapt their personal travel? A conceptual exploration of the consideration of travel-related strategies", *Transport Policy* 12: 199-206.

Cao, X., Mokhtarian, P., (2005b) "How do individuals adapt their personal travel? Objective and subjective influences on de consideration of travel-related strategies for San Francisco Bay Area commuters", *Transport Policy* 12: 291-302.

Espíno, R., Ortúzar, J., Román, C., (2003) "Analyzing the effect of latent variables on willingness to pay in mode choice model", Proceedings of the ETC 2003, Strasbourg, France.

Fowkes, A., Wardman, M., (1988) "The design of stated preference travel choice experiments with special reference to interpersonal taste variations", *Journal of Transport Economics and Policy* 22: 27-44.

Fowkes, A., (2000) "Recent developments in stated preference techniques in transport research", In: Ortúzar, J. (ed.) *Stated Preference Modelling Techniques and Perspectives* 4, PTRC; London.

Greene, W., (2003) *Econometric Analysis*, Prenctice Hall, New Jersey.

Hanley, N., Mourato, S., Wright, R., (2001) "Choice modeling approaches: a superior alternative for environmental valuation?", *Journal of Economic Surveys* 15.

Kahneman, D., (2003) "Maps of bounded rationality: psychology for behavioral economics", *American Economic Review* 93: 1449-1475.

Louviere, J., Hensher, D., Swait, J., (2000) *Stated choice methods: analysis and applications*, Cambridge University Press, Cambridge.

McFadden, D., (1973) "Conditional logit analysis of qualitative choice behavior". In: Zarembka, P. (eds) *Frontiers in Economics*, New York Academic Press, New York.

McFadden, D., (1974) "The measurement of urban travel demand", *Journal of Public Economics* 3: 303-328.

Merino-Castelló, A., (2003) "Eliciting consumer preferences using stated preference discrete choice models: contingent ranking versus choice experiment", *Working Paper 705*, Universidad Pompeu i Fabra.

Pereira, P., Budria, S., Almeida, A., (2005) "Analyzing mobility in the Atlantic Area of Madeira, Azores and Canary Islands", mimeo, University of Madeira.

Rudel, R. (2005) "Evaluation of quality attributes in freight transport market: stated preference experiments in Switzerland", *European Transport* 25-26: 52-60.

Sudman, S., Bradburn, N., (1982). *Asking questions: a practical guide to questionnaire design*, Jossey Bass, San Francisco.

Train, K., (2003) *Discrete choice models using simulation*, Cambridge University Press, Cambridge.

Wardman, M., (1988) "A comparison of revealed preference and stated preference models of travel behaviour", *Journal of Transport Economics and Policy* 22: 71-91.

Williams, G., Pagliari, R., (2004) "A comparative analysis of the application and use of public-service obligations in air transport within the EU", *Transport Policy* 11: 55-66.

European Transport \ Trasporti Europei n. 39 (2008): 14-32

The dominance of the Lisbon agreement as a barrier for an environmentally oriented transport policy in Europe; the gap between theory and implementation in policy integration

H. Geerlings [1*], M. van der Sluis - van Meijeren [2]

[1] Erasmus University Rotterdam / PhD School TRAIL
Department of Public Administration
PO Box 1738, 3000 DR Rotterdam, The Netherlands

[2] Delft University of Technology
OTB Research Institute for Housing, Urban and Mobility Studies
PO Box 5030, 2600 GA Delft, The Netherlands

Abstract

There is an increasing demand for policy integration in a number of policy areas. This is also the case when it comes to the ambition to realize a sustainable transport system, where seemingly contrasting issues such as economic growth and the related negative effects, increasing emissions for example, have to be brought together. This article deals with the theory of policy integration and reviews selected policy documents at the European level, with the attempt to draw conclusions about the success and inadequacies of actual policies when it comes to policy integration. With two illustrations, one showing the efforts to introduce biofuels and another focusing on the introduction of new and more strict emission standards, the authors present the difficulties that exist. Based on interviews with policy-makers at the European Commission, the authors present empirical evidence of the barriers. This evidence is the basis for an analysis and better understanding of the factors that influence present EU-policymaking in the field of sustainable transport and leads to the conclusion that there is a danger that the Lisbon objective (i.e. “competitive Europe”) prevails on the Gothenburg objective (i.e. “sustainable Europe”) and that this has a negative effect on the implementation of a European sustainable transport policy.

Keywords: Policy Integration, Sustainable Transport, EU.

---

* Corresponding author: Dr. Harry Geerlings (geerlings@fsw.eur.nl)

1. Introduction

Since the founding of the European Economic Union in 1957, transport has been perceived as an important driving force contributing to the objective of creating one single European Market. Stimulated by the sectoral transport policy of the European Commission, the transport sector has shown, for decades now, an unprecedented growth.

The significant external effects related to the benefits of transport, such as environmental considerations and increasing congestion, have led to a change in the scope of policies and there is an increasing need for the integration of the different policy fields that deal with the wider context of transportation systems. This trend has developed over the last 10 years and can be considered as a reaction to previous policies that were characterized by central steering, a hierarchical set of relations and the autonomous sectoral policy developments for specific domains such as transportation, environmental and spatial policies.

In this article we describe the theory of policy integration and analyse how it works in practice. Section 2 deals with the different theoretical concepts of policy integration. In Section 3 the establishment of the EU is discussed, based on policy document analysis, with special emphasis on the different trends in policy-making. An important trend in this context is the shift from sectoral policy-making to a more integrated approach. In Section 4 the authors give an example of the current ‘integrated’ approach in practice, focusing on the ambition to achieve a sustainable transport system. It shows that at several points there is a lack of integration and that the drive towards an integrated approach seems to have stagnated. In Section 5 an analysis of this stagnation is presented. This section is based on semi-structured interviews with 12 policymakers from different DGs (varying from DG Transport and Energy (TREN) to DG Environment (ENV) and DG Research) and a member of parliament. In most cases the interviewed policymakers were very open to us. This openness, however, comes at a price, as we were not allowed to record most of the interviews and the authors had to agree to use only anonymous quotes. A report was made after every interview which was corroborated by the interviewees. Although the information we gained is not directly traceable and therefore scientifically less strong, we were given some interesting insights and information that we would not have received if the paper had been written based only on the extended literature available. Finally, in Section 6, conclusions are drawn.

2. The theory of policy integration

Policy integration has been on the EU agenda since the early 1980s, particularly since the 1992 United Nations Conference on Environment and Development (UNCED),[1] and has gained in profile through a series of environmental action programs, and in the inclusion and strengthening of the integration requirement in successive amendments to the EC Treaty[2]. The need for cooperation and new instruments is reflected in present policy-making in the EU and the member states of the EU. In the White Paper on Governance (2001c)[3] it is stated that there are big challenges ahead in the field of subsidiarity, decentralization, the public-private interface, consultation standards and procedures and coherence of policies. But the biggest challenge was the enlargement of the European Union with 12 new member states in 2005[4]. It concerns the integration of 12 new countries and 100 million new European citizens.

---

[1] Principle 4 of the declaration from the 1992 United Nations Conference on Environment and Development states that “in order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it” (United Nations, 1992).

This important and structural change requires a redefinition of European institutions. In this paper we concentrate on the integration of transport, land use planning and environmental policies on the European level. Policy integration concerning transport directed by several DGs, has been an area of interest at the European level for some time. There are several areas that are key to the development and future of transport policy, environmental policy and spatial policy which are beyond the scope of this paper, but the Commission itself indicates their challenges for the coming decennium. For instance, there is a Joint Expert Group on Transport and Environment 2000 that is looking at changes in the transport policy in combination with measures in other policy areas to obtain more sustainable development. The Cardiff process, initiated at the EU-council meeting in Cardiff in 1998, aimed to integrate environmental concerns into transport policy. Since then the idea of sustainability has been implemented in the EU-treaty and at the Stockholm Summer in 2001 the European Union's Sustainable Development Strategy was published. In the White Paper on European Transport is stated "*a modern transport system must be sustainable from an economic and social, as well as an environmental viewpoint.*"

At the beginning of the 21st century two OECD reports referred to policy coordination (see Stead and Geerlings, 2005 for a thorough analysis). The first, which focuses on policies to enhance sustainable development, includes analysis and advice on how governments can develop integrated approaches to decision-making (OECD, 2001a). The second, a report on critical issues for sustainable development, talks about the need for greater policy coherence and the better integration of economic, environmental and social goals in different policies and identifies three distinct organizational approaches for the integration of sustainable development into policy (OECD 2001b):

- *coordination approaches* (such as inter-ministerial working groups)
- *structural approaches* concerning internal institutional arrangements (such as departmental mergers)
- *strategic approaches* (such as shared agendas).

---

[2] Article 6 of the Amsterdam Treaty, signed in 1997, places integration among the main principles, and clearly links integration with the promotion of sustainable development. The emphasis placed on integration by the Treaty came at a time when there was a growing realization of the inadequacy of environmental policy *per se* in tackling the underlying causes of environmental degradation caused by other sectoral policies and activities.

[3] The White Paper on Governance makes recommendations in three areas: (i) with regard to participation and openness of policy-making and decision making; (ii) with respect to coherence and effectiveness of policies; and (iii) with respect to the division of powers between European institutions.

[4] The Laeken European Council (December 2001) agreed that 10 applicant countries would reach the accession criteria (Cyprus, the Czech Republic, Estonia, Latvia, Lithuania, Poland, Slovakia, Malta, Hungary and Poland. Bulgaria and Romania reached this goal in January 2007.

Within the literature concerning the theory on policy integration various concepts can be found (for a more detailed review see Geerlings and Stead, 2003). These include *coherent policy-making, cross-cutting policy-making*, *policy co-ordination* and *holistic government*, also known as *joined-up policy* or *joined-up government*. Whilst some authors see policy co-ordination as more or less the same as integrated policy-making, others regard them as quite separate and distinct. The OECD, for example, observes that policy integration is quite distinct and more sophisticated than policy co-ordination in two ways: (i) the level of interaction; and (ii) the output (OECD, 1996). Stead et al (2004) distinguish between a number of distinct terms and suggest a hierarchy of these terms:

- *policy co-operation*, at the lowest level, which simply implies dialogue and information
- *policy co-ordination*, *policy coherence* and *policy consistency* – all quite similar, implying co-operation plus transparency and some attempt to avoid policy conflicts (but not necessarily the use of similar goals)
- *policy integration* and *joined-up policy* – includes dialogue and information (as in policy co-operation), transparency and avoidance of policy conflicts (as in policy co-ordination, policy coherence and policy consistency) but also includes joint working, attempts to create synergies between policies (win-win situations) and the use of the same goals to formulate policy.

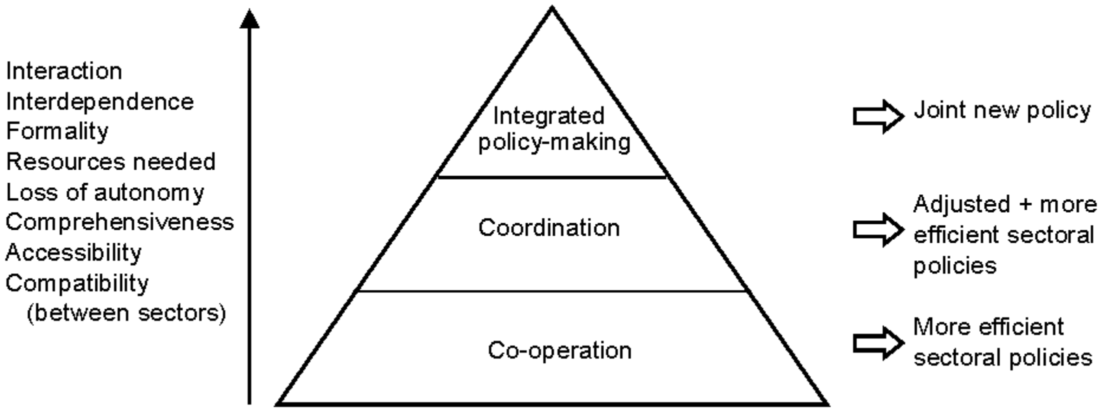

Interaction
Interdependence
Formality
Resources needed
Loss of autonomy
Comprehensiveness
Accessibility
Compatibility
(between sectors)
Integrated policy-making
Coordination
Co-operation
Joint new policy
Adjusted + more efficient sectoral policies
More efficient sectoral policies

Figure 1: Different levels of policy co-operation and integration

Other related concepts in the organisational literature that have potential relevance concerning policy integration include *inter-organisational co-ordination, inter-organisational collaboration*, *inter-governmental management* and *network management* . These related concepts primarily concern co-operation between organisations, rather than co-operation between departments within one organisation but are nevertheless also relevant since inter-organisational policy-making and intra-organisational policy-making are to a considerable extent similar when it comes to integrating issues that are cross-sectoral. After all, within one organisation, different sectoral departments often operate as different organisations with their own specific professional styles, approaches, needs, agendas and modes of operation.

These experiences led to a new paradigm for policy-making. Bulmer and Radaelli (2004) underlined the need for coordination and integration.

There are 3 patterns of governance that determine how the European Commission realizes integration.

- *governance by negotiation*: this refers to the mechanisms of 'uploading' (or vertical policies) national policy preferences by bargaining processes among nation states. National preferences and rules are inserted into EU-negotiations. This entails essentially European Integration, but anticipation of
- *governance by hierarchy*: the importance is stressed of powerful institutions such as the decisions by the Council, EC (directives, guidelines) and ECJ (judicial decisions). The effective power is strongly dependant on
  a) a positive integration regime, for instance by *law making,* as a substitute for national legislation and government intervention. The EU policy template has to be downloaded to the member state level. The EC has to ensure that rules are properly implemented. This leads to supremacy of EU law, coercive natures, sanctions, etc.
  b) a negative integration regime by *market making*: this concentrates on the removal of national rules and barriers, with the emphasis on market-making rather than rule-making. EC and ECJ are in this case the market-arbiters.
- *facilitated coordination:* this refers to policy areas where national governments are the key actors, and are not/hardly subject to EU law. Formal rule for this policy is the principle of unanimity. Factually it is based on soft law making and declaratory policy. The EU institutions have weak powers here. Cross fertilization of ideas and goals and learning principles are important. The aim is definitely convergence.

3. The establishment of the EU-transport policy

3.1. The historic background

The 1957 Treaty of Rome, which marked the foundation of the European Economic Community (EEC)[5] stated that the aims of the EEC would be "*to take care of the continuous improvement of the living and working conditions of its population*" and that at the same time the EEC would strive for the "*harmonious development of her economies*". This might suggest a balanced approach but in practice the emphasis in policy-making was mainly on economic development and the attention given to non-economic issues took second place. Looking back it can be concluded that, in the early days of EEU policy-making, the policies were based on a sectoral approach in which transport was strongly valued as a driving force for economic prosperity. The free movement of people and goods was, as a stimulus for the creation of a single European market (one of the pillars of Treaty of Rome), strongly enhanced.

The attention given to the European environmental and spatial policy was meager. Transportation, probably due to the fact that policy makers were not aware of the negative external effects, was not considered as an area of political priority. In 1972, it was agreed by the Community Heads of State at the Paris Summit that economic expansion should be accompanied by an improvement in the 'quality of life' and it was therefore agreed that more attention should be paid to environmental issues. At this time, however, there was a strong sectoral approach to policy-making. This was traditionally the case in transport policy. Even though transport was perceived as an important element in economic prosperity, the policy initiatives were not embedded in a well-structured approach.

---

[5] The *Treaty of Rome* was agreed by the 6 founding countries: Belgium, France, Italy, Luxembourg, the Netherlands and West Germany.

3.2. From specialization and harmonization to coordination

An important change took place in 1986 with the amendment of the *Single European Act*. In that year a decision about the creation of a single European market was made. The name of the European Economic Community (EEC) changed to European Community (EC) to stress the balanced approach of policy issues. There was also the increasing awareness that creating a single market would generate new requirements for policy-making, such as stronger coordination rather than further specialization. It was also clear that unification would lead to a single market with economic advantages where transportation would play an important role, but, as a consequence, other policies such as spatial policy would deserve more attention as well. As a result, since 1986 environmental policies and land-use planning have also been recognized as important domains.

A number of interesting trends in policy-making can be observed since the 1980's. The recognition of new domains required new approaches for policy documents, policy instruments, data and research activities (see also section 2). Harmonization and *co-operation* of various policies became important. For instance in transport a Common Transport Policy was launched (CTP). It was published in 1985 with the White Paper on the Completion of the Internal Market. In the period between 1985-1991 the Commission initiated more than a dozen directives and regulations in an attempt to establish more harmonization .[6] Harmonization means in this respect that different policy initiatives were judged on whether they were contradictory to each other or not in order to make them more effective. Attention was given to new policy initiatives, the development of policy instruments and the development of research initiatives that would support this broadening of the policy area.

Since the mid-1990s, it has become clear that harmonization and co-operation was not enough. For instance, it became clear that the structural foundations for southern European countries led to the construction of new infrastructure but at the same time the environmental policies had to be strengthened because of damage to the natural landscape.

As a result of these difficulties, the dominant paradigm changed to *coordination* in the nineties (longer term policies and preventative policies for example). This development is reflected in policy papers and research programs.[7] It was later recognized that a reinvention of policy-making was also needed as a consequence of the proposed expansion of the European Community. From the environmental perspective for example, CO_2 emissions became more of a policy priority, whilst congestion in urban areas became a new policy priority in the field of urban planning. As a result of these new challenges there was more need for further policy coordination, namely the awareness amongst politicians that policies had to be directed towards *sectoral integration.* This change in policy priorities is also reflected in the policy documents and research priorities (see also Geerlings and Stead, 2003). The challenge was, and as this article will show (see also section 4) still is, European transport policies are strongly influenced by the European Union institutional architecture. More exactly, a European policy agenda does not exist; the European policy results from several sectoral agendas.

---

[6] Amongst them important ones such as CD 440/91 on the development of railways and CR 3820/85 on the harmonisation related to road transport. Furthermore three liberal packages on air transport were launched.

[7] See for example Energy for a New Century (Commission of the European Communities, 1990a), Towards Sustainable Mobility (Commission of the European Communities, 1992a), the Green Paper on the Urban Environment (Commission of the European Communities, 1990b).

3.3. The Environmental agenda; the drive to policy integration

A variety of policy documents have been published since the mid 1990s that discuss the issue of policy coordination and integration. They all stress the need for better coordination between different DGs, if EU transport policy is to be more sustainable and effective. Some documents that were directed in this period still have a sectoral focus, whilst others developed into policy-documents with a more inter-sectoral perspective (concerning sustainable transport policy documents from DG Environment for example). Selected examples of such inter-sectoral policy documents are briefly discussed here.

In terms of *transport policy* documents, the European Transport White Paper of 2001 (Commission of the European Communities, 2001a) explicitly recognizes that the concept of sustainable development[8] is central to Community policy-making. The White Paper highlights the need to integrate environmental considerations into transport policy directed by the DGs. How integration can be achieved in practice remains unclear from the document. The document also recognizes that transport policy alone is not sufficient to tackle current transport problems and advocates an integrated approach with other areas of policy-making, such as economic policy, land-use planning policy, social and education policy and competition policy. Whether this new White Paper on European Transport marks the beginning of a new phase of development of the Common Transport Policy still remains to be seen. It seems unlikely because in 2006, five years after the publication of the European Transport Paper, the European Commission issued a mid-term review (European Commission, 2006). This mid-term review assesses the progress towards the Transport White Paper's original objectives. The mid-term review maintains that the objectives of the White Paper remain valid. But the prevailing view of the Commission is clearly that transport policy should facilitate mobility, rather than manage it.

As with all European documents, the mid-term review contains the obligatory reference to the Lisbon agenda, stating that the objectives of the European transport policy are *"fully in line with the revised Lisbon Agenda for jobs and growth"*.

This is also concluded by Stead (2006) who observes that despite mentioning the recently revised European Sustainable Development Strategy (Council of the European Union, 2006) which was published a few days before the mid-term review of the

---

[8] The Treaty of Amsterdam (agreed by the European Union's political leaders in June 1997 and signed in October 1997) introduced the principle of sustainable development into the EU Treaty and requires that "*environmental protection requirements must be integrated into the definition and implementation of other Community policies*". It was the Stockholm meeting in 2001 that declared the concept of Sustainable Development a leading principle in policy-making by the European Commission.

Transport White Paper and the Kyoto Protocol, there is no noticeable reference to the Gothenburg Agenda.

The document was in any case not easy to produce, with consultation beginning as early as 1999, but in the end the concept of sustainable mobility became the central focal point of the White Paper as published in 2001. The term sustainable mobility refers to the need for free movement of people and goods (see section 1.2), whilst at the same time there is a need for protecting the environment and improving the health and safety of citizens. Various European *spatial planning* policy documents, such as the 1990 Green Paper on the Urban Environment (Commission of the European Communities, 1990b) and the 1996 report of the Expert Group on the Urban Environment (Expert Group on the Urban Environment, 1996) stress an integrated approach to policies for transportation too. According to the report of the Expert Group on the Urban Environment, "*the fundamental challenge is to achieve integration: integration between different levels (vertical) and between different actors in the policy process (horizontal)*". The European Commission's communication on urban policy touches on this issue and talks about engaging different levels of decision-making to achieve better policy integration (European Commission, 1997). The European Spatial Development Perspective (ESDP) also alludes to policy integration, recommending for example that location policy must be compatible with transport policy (European Commission, 1999).

Several recent policy documents concerning *sustainable development* focus on the issue of policy integration too. For example, the EU's Third Environmental Action Programme (1982-1986) placed integration very highly. The Fourth Programme (1987-1991) proposed developing internal procedures and practices to ensure that integration took place routinely in relation to other policy areas. The integration principle was given legislative force in the European Community by the 1986 Single European Act and was further strengthened by the Maastricht Treaty. The Treaty revision was reflected in the Fifth Environmental Action Programme (1993-2000), which shifted its focus from environmental problems to addressing the fundamental causes of environmental degradation, giving special attention to integration in five target sectors: *agriculture*, *transport*, *tourism*, *energy* and *industry*. The European strategy for Sustainable Development also calls for further integration of environmental concerns into sectoral policies (Commission of the European Communities, 2001b).

The issue of policy integration was discussed at the meeting of the 1998 European Council in Cardiff, where the council called for specific strategies for the integration of environmental concerns into three areas of policy: transport, energy and agriculture. This marked the start of what is known as the 'Cardiff Process'. Subsequent European Council meetings in 1998 and 1999 called for environmental integration strategies for other areas of council policy (internal market, industry and development in 1998; fisheries, general affairs and Ecofin in 1999). A chronology of developments in Europe on the integration of environmental issues into other areas of policy from 1990 onwards is presented in Appendix 1.

4. The ‘integrated’ approach in practice

4.1. The case of sustainable transportation

The transport sector is considered an important driving force contributing to the objective of the creation of a single European Market and is therefore an important element of European policy-making. As mentioned, transport policy is directed by several DGs, what makes it even more difficult to develop a single European transport policy that reflect the two already frequently competing aims of sustainability and mobility. The positive contribution of transportation to the economy makes it difficult not to strive for more mobility. There are however several side-effects that need to be addressed. Two of the major issues in this context are the energy supply and the impact of transportation on air quality. These different issues need to be addressed in a coherent way in order to be able to stimulate the development of a more sustainable transport sector.

The transport sector has been characterized over the last 3 decades by unprecedented growth. This growth can be observed in both passenger as well as freight transport. Across Europe as a whole since the mid-1990s, the growth in goods transport has been faster than economic growth, while the growth of passengers is only slightly slower than the economic growth. Projections up to 2020 indicate further growth in transport, particularly in freight transport: freight and passenger transport is predicted to increase by 52% and 35%, respectively between 2000 and 2020. This growth is unbalanced in the sense that the figures are very spectacular for air and shipping (due to globalization and containerization). Air and waterborne transport have both grown rapidly over the last decade and low-cost flights now account for 25% of all scheduled intra-EU air traffic. This unbalanced growth is a concerning trend because the growth is occurring in the faster but also more energy consuming modalities which conflicts with the aim of a more sustainable transport system in Europe.

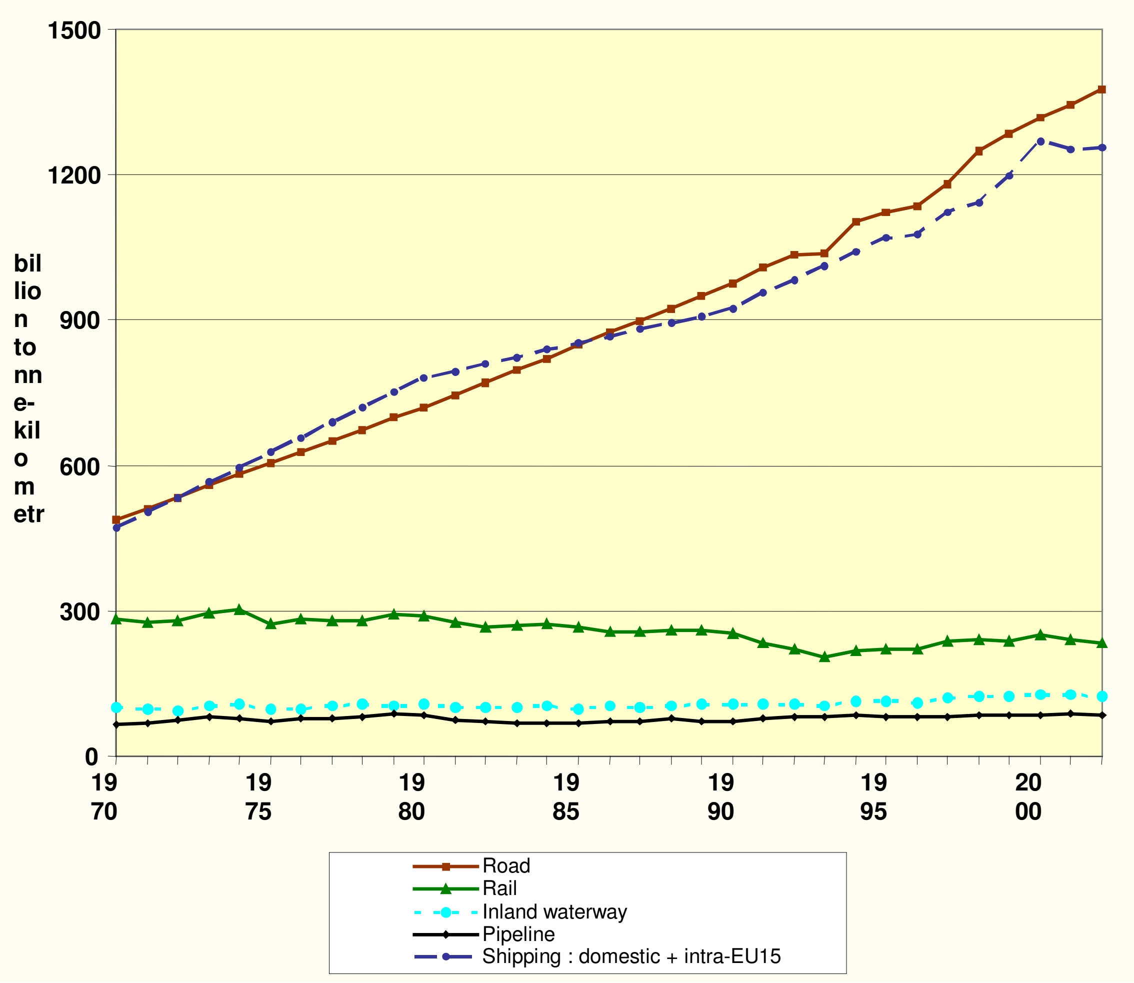


Figure 2: The growth of freight transport in the EU 25 between 1970 and 2002

The need for a *sustainable* transport system has been studied for many years and is reflected in numerous reports and policy documents. The meaning of the concept of sustainable development for the transport sector is not well-defined. There is a diversity of short-term needs and concerns, as well as the long-term goals throughout the world, suggesting that there is no universally `correct' or `wrong' sustainable development. To achieve sustainable transport, policy makers perceive trade-offs between the ostensibly conflicting needs for economic development (and consequently increasing mobility) and the global concern for the utilisation of scarce resources and the quality of the natural environment. If sustainable transport is the starting-point for environmental policy, there should be an integration of the economic and ecological objectives in which the ecological aspects could function as a limiting condition. But there seems a superficial difference in interests that creates major difficulties in practice. We will focus on the different opinions expressed from the perspectives of energy policy and air quality related to the transport sector, using two illustrations.

Illustration 1: The biomass Action Plan

The main objective of the Green paper on Energy Supply is to come to a fundamental reformulation of the existing EU energy policy. In this policy there are three central themes: a) improvement of competitive position, b) sustainability and c) security of supply. The document is explicit about what is needed for the transport freight sector, namely an optimisation of traffic flows by satellite navigation (Galileo), stimulating inter-modality (through the Marco Polo programme) and the development of a market for clean vehicles. Related to the classification presented in section 3.2 on the instruments used by the Commission, we see that the Commission presents actions that relate to all the options available (negotiation, hierarchy and co-ordination).

At the same time there have been significant increases in greenhouse gas emissions from domestic transport since 1990 across the EU (23% growth) alongside larger increases in emissions from air transport (currently increasing at a rate of 4% per annum, which equates to an increase of almost 50% over a period of 10 years).

Here we face a new emerging political priority. Part of the answer to this challenge can be found in the need to look for alternative fuels. The Commission, therefore, published its Biomass Action Plan (2006) that has a clear relation to freight transport. The Biomass Action Plan is a direct result of the Green Paper where the need is expressed to develop a market for clean vehicles. Here we see a clear example of coordination. The transition to biofuels provides only two ways of reducing CO2:

1. focus on cleaner cars: set rules for car manufacturers
2. a transition from fossil-based fuels to biofuels

Even though there is a clear relation between energy consumption and emissions – the emissions generally increase as the fuel consumption increases – and it is accepted that there will be a scarcity of fossil fuels, there are different opinions on how to move forward.

A DG TREN (energy) representative express it thus: *“We have to look to alternative ways for fuel supply and as transport is an important sector, we are convinced that bio-mass is a serious option”*. At the same time a policy maker from DG Environment states *“This policy has not been discussed with us, actually we think that there are serious negative effects in terms of global trade, land-use, but there are also emissions generated during the production and by the use when it comes to combustion. So we are not convinced at all that this is the best option. Maybe for the moment, but certainly not for the longer term. But we were not heard when were critical. Economic interests prevailed.”*

In this illustration we see that despite all efforts to come up with integrated policies, it is hard to realize policy integration in practice and in this case even coordination was hard to realize.

Illustration 2: The CAFE emission standards

There is also great concern about the air quality in Europe. This is expressed in the programme Clean Air For Europe (2001d). In this program the Commission tried to improve the air quality in Europe to a level on which ‘no significant bad effects’ are present for human health and the environment. To achieve this objective, several initiatives were announced.

- One of the initiatives is to come up with new standards, the so called CAFE (Clean Air For Europe)-standards. CAFE mainly focuses on health aspects; in 2020 the number of early deaths as a result of air pollution must be reduced by 40% compared to 2000.

- In the strategy developed from CAFE, special attention is given to particulate matter (PM) and ozone (O_3) at ground level, because these pollutants are considered most threatening to health.

Related to this there is the UNECE agreement (the so called Gothenburg Protocol) that focuses on the effects of air pollution on ecosystems.

There is also a new set of instruments presented in this context. The existing European law and policy is regulated via the Air Quality Framework Directive (and its various daughter directives) which has been merged into a single "Air Quality Directive".

The most important propositions from the Thematic Strategy and new Air Quality Directive (September 2005) will come into effect in 2010. The effectiveness of this directive is questionable and can be seen as a typical result of 'governance by negotiation' (see Section 2).

The representative of DG ENV states: "*These standards are much too soft. This is a compromise so that no Member State or even car manufacturer will experience negative consequences"*. But also the process of decision-making is criticized: *"This was a very frustrating job: too much work and no respect for all our efforts and expertise. When it comes to the point we see that DG TREN is simply not interested in environmental quality and the car manufacturers have too much influence".*

This is confirmed by an employee who works for DG TREN (transportation): *"Our Commissioner is not ambitious when it comes to sustainable transport. You can see it in the mid-term review of the White Paper. The previous White Paper expressed ambition, the mid-term review* (2006 authors*) gives enough arguments for stronger policies but no new measures are announced".*

And someone from DG Research: *"This is not only illustrative for DG TREN, but for the whole Commission: enlargement has already made effective policy-making more difficult, but they are still in shock since the constitution was not accepted. You see it in FP7* (the Research Programme of the Commission authors) *as well. All efforts are checked against the Lisbon objective, but not against sustainability. At least not on an equal basis".*

This impression is also confirmed by members of the European Parliament, where a series of policy initiatives is on its way. "*We miss leadership and vision in the present Commission* (Commission Barosso authors). *Parliament is also ineffective when it comes to policy integration. There is simply too little turmoil and theatre in the parliament, as everything has been prepared in thematic groups, workgroups and with almost 800 members of parliament it will only get worse".*

Quote: *"Sometimes I'm really surprised. It seems during the so-called first reading, that the parliamentarians and DGs did not communicate with each other. This was very clear with the discussion on air quality. There is the need to come up with integrated policies, but it stagnated. At best there is* ***policy coordination*** *between the different DGs".*

It can be concluded that on different levels of policy-making the aim to reach a more integrated policy in the transport sector to reach a more sustainable European transport system isn't realized. This stagnation is not because the relevance of the topic isn't recognized. It is. It is caused by the existing institutional structures and the countervailing interests that are involved. The next chapter shows which countervailing interests, recent developments and internal structures are preventing a more integrated en sustainable policy in the transport sector from realizing.

5. A renaissance of sectoral policies?

We come, after analyzing the EU-policy trends over the last 40 years and a series of interviews held with representatives from the European Commission in spring 2006, to the observation that the basis for a balanced transport policy is rapidly weakening and the drive for a more integrated approach is stagnating, due to different influences.

5.1. Changing perspectives; the role of the Lisbon agreement

There has been general agreement since 2000 among policy makers (on the European level but also on the level of the individual member states) that the European economy lags behind at the global level. With the inauguration of the Commission Barosso in 2004, therefore, the Lisbon Agreement was re-nominated as the new guideline in European policy-making. The objective of the Lisbon Agreement is *"to make Europe one of the most competitive economies of the world in 2010 combined with an economic growth of 3% per annum"*.

Every new policy initiative has to be in line with this objective. There is concern that the Commission Barosso has fallen back on a single issue strategy, based on the Lisbon agreement, which has a sincere negative impact on the trend towards integrated transport policy.

Based on the series of interviews with representatives from DG Transport and Energy (TREN) it was confirmed that the current policy and future policy initiatives have to strengthen the Lisbon Strategy. As a representative from DG TREN puts it: " *Since the Lisbon Agenda and the appointment of the new commissioner (he is an economist) within TREN we have focused strongly on economic growth. It used to be different. We used to pay more attention to the concept of sustainable transport. Some attention is given to the negative external effects of transport and we will look deeper into the concept of biofuels in the near future, but there has definitely been a shift in priorities. There is a trend towards more attention on the economic benefits of transportation and growth is supported."*

This new, or maybe renewed, strategy has had its effect intra-organizationally too. It seems to have led to a profoundly negative effect on the motivation and enthusiasm in other DGs when it comes to new initiatives. Representatives from DG Environment declare that the ambitions in the field of environment are strongly tempered due to the lack of interest by the Commission in general and DG TREN in particular. This is explained by a lack of political interest in taking the concept of sustainability seriously if there is a risk that there would be trade-offs with the economic objective of the Lisbon Agreement. "*It is very difficult for us at this moment to put our opinions on the agenda. Transport costs are extremely low and this is partly the reason why transport can be seen as an engine for economic growth. I believe that as long as we do not try and find ways to take, for example, the negative external effects of transport visibly into account, it is very difficult even to find the path that leads to more sustainable ways of transport"*, says a policymaker from DG Environment.

This quote is strengthened by severe budget cuts and a lack of support from within the member states to undertake policy initiatives that might have a negative effect on economic growth[9].

As already mentioned in Section 4, in 2006, five years after the publication of the last European Transport Paper, the European Commission issued a mid-term review (European Commission, 2006). This mid-term review assesses the progress towards the Transport White Paper's original objectives. The mid-term review maintains that the objectives of the White Paper remain valid. But the prevailing view of the Commission is clearly that transport policy should facilitate mobility, rather than manage it.

The mid-term review states that the focus of transport policy needs to be revised because of a combination of emerging issues and developments like, for example, the enlargement of the European Union in 2002, recent changes in the transport industry, evolving technologies and new innovations, and energy supply and security issues. And as with all European documents, the mid-term review contains the obligatory reference to the Lisbon agenda, stating that the objectives of the European transport policy are *"fully in line with the revised Lisbon Agenda for jobs and growth"*.

This is also concluded by Stead (see section 3) who observes that there is no noticeable reference to the Gothenburg Agenda. This provides another indication of the current relative priorities of jobs, growth and sustainable development in European policy-making.

5.2. The lack of cooperation

In Section 4 the common interest of DG TREN and DG Environment in the field of biofuels is given as an example. In this case we see that within the field of transport, different DGs have different opinions on how to respond to biofuels. The interviews showed us that the path to find a common policy has not been taken. Policy maker from DG Environment state that it is very difficult even to talk to policymakers from DG TREN. "*We are not always present in cases that we can provide information about, for example in this case, the costs of land use when studying the possibilities of using biofuels. We try to make and keep in contact, but it is difficult. And we never have a corridor chat, because our building is situated in another district.*"

At the time the interviews were held there was even the accusation that DG TREN is purposefully neglecting the negative external effects of transportation and that this is supported by the Commission Barosso. Since then, there is a feeling of distrust from Environment towards TREN. "*They did not use our data, but had other data that did not take everything into account and were, in our opinion, not suitable. They rather tempered the negative external effects than showing the actual picture"*, states a member of DG Environment. This lack of communication and feeling of distrust creates a barrier to more integrated policy-making. The interviewee from DG Environment states that Environment now has a deep concern for crumbling support (both policy-wise and politically) for sustainable actions to be taken in the transport sector.

---

[9] In the Netherlands, 60% of the inhabitants have no trust in European policy-making, 52 % of the people are against further enlargement and 40% of the Dutch people do not perceive it as a problem if the EU was dissolved (see www.DNB.nl – outcome of a national review November 30, 2006).

5.3. Concern for the declining legitimacy of the EU

Over the last 5 years the European Commission has been confronted with important new developments that have greatly affected policy-making. Some developments are fundamental to the consequences of the enlargement challenges with which the Commission has been confronted. This is a major challenge for Europe and the Commission as it concerns the integration of 12 new countries. It requires a redefinition of European institutions and the decision-making process.

The European single market is also finding it difficult to adapt to the new challenges of other fundamental changes such as the ongoing process of globalization. Internally, due to the free movement of people (and cheap labour), there are different attitudes between the Member States when it comes to the benefits of the Lisbon Agreement and there is the rejection of the Constitution in 2006 by France and the Netherlands. And more recently by the popular vote in Ireland (2008) that demonstrates the increasing skepticism on the role of the EU. Several policymakers stated that the rejection of the constitution has led to a withdrawn of the Commission in taking initiatives. This also concerns policies in the field of sustainable transport. "*The Commission was somewhat paralyzed by the rejection of the constitution by France and the Netherlands. It's an uncertain time, where the relation between the Commission and the Member States might come to a new definition*", a policy maker of DG TREN tells us.

The internal organization also seems to hamper new developments. An employee from DG Research "*We have to attract new employees only from the new member states to reach the right quota in the number of personnel. Quality is no issue these days".* And *"We need leadership. Not only the Commission is weak, but the role of the Heads of State is too passive".* The parliamentarian: "W*e see that over time the Commission intervened in every element of society and they did not see that this was not appreciated by the people. They have lost contact. The Commission should bring down its ambition and focus on fewer, but more important issues".*

6. Conclusions

Over the last ten years there has been an increasing call for greater policy integration in European policies and related research programmes. This has come at a time when decision-making is facing increasing complexity as a result of various developments. Within the academic literature concerning the theory of policy integration various concepts and instruments are studied. These experiences have led to a new paradigm for policy-making where 3 patterns of governance can be determined, namely governance by negotiation, governance by hierarchy and governance by facilitated coordination. All three paradigms can adequately be used in understanding policy integration in practice.

The concept of policy integration is also applied in a series of policy documents published by the EU and the OECD. The European Common Transport Policy (CTP) is a recognized and strong instrument to realize the European policy objectives. A variety of policy documents have been published since the mid 1990s that discuss the issue of policy integration and stress the need for better coordination in the transport field, especially when it comes to the integration with requirements related to the operationalization of the concept of sustainability; the concept of sustainable mobility calls for further integration as it will contribute to a balanced policy that combines the transport and economic interests, the environmental concerns and the spatial complexities.

It appears to be difficult to operationalize integration in practice. Section 2 shows the difficulties that occur in realizing policy-integration within the EU and the Member States. This is illustrated in this paper by two cases, namely the introduction of bio-fuels and the drive towards strict emission standards for Europe. There are different barriers identified. The internal difficulties relate to a different perception of the urgency of the policy objectives, a lack of shared vision between the different DGs and within the parliament, the dominance of the Lisbon Agreement and simply a lack of communication. Also the declining legitimacy of the EU among the Member States plays an important role.

The effect of the current policy making by the Commission Barosso means that the concept of sustainable development is given less attention compared to five years ago and that the objective of the Lisbon Agreement has become the dominant policy objective, at least for DG TREN, but also for the Commission as a whole. Illustrative of this is the mid-term review of the Transport White Paper (2006) that includes the statement *"mobility must be disconnected from its negative side effects"* but a proposed action list is not included and the document does not offer any new perspectives. There is discomfort in DG Environment with these direct effects of the Lisbon Agreement. The DGs had not tried, by the time this research was conducted, to overcome these different opinions by communicating the issues mentioned in this paper.

Not only the lack of communication sets back the process of policy integration. Policy makers of DG Environment mentioned there is a lack of trust as well that undermines proper communication. The integration process in the two cases we studied and discussed with the interviewees felt, due to mistrust, back to a level where co-operation (see figure 1) wasn't even practiced. Less efficient sectoral policies prevailed at the time this research was conducted and when the level of communication stays at the same level, the situation will most likely stay the same. And consequently this will lead in the near future to a more sectoral and less integrated policy concerning bio-fuels and strict emission standards for Europe.

The process is strengthened by the rejection of the European Constitution in 2006 by France and the Netherlands and leads to a feeling of declined legitimacy of the European Commission among the interviewees. The policy makers stated that this has reduced activities, also in the field of sustainable transport. The Commission has taken a few steps back and leaves the initiative often to the Member States.

We conclude that there is a development in EU policy making where the interest in policy integration is diminishing and that a severe danger has arisen that sectoral policies remain dominant again. Overall we observe a trend that the "Lisbon" objective prevails on the Gothenburg objective (i.e. "sustainable Europe") and that there is a threat that this has a negative effect on the implementation of a European sustainable transport policy. From a sustainable transport perspective the new issues that need to be addressed are definitely the greenhouse effect, security and energy supply. These are challenges where no solution is foreseen in the short-term and where the Commission can play a constructive role. Taking up these new challenges will definitely show that given the complexity of the issues, policy integration is in this context a precondition for successful new policy initiatives.

References

Bulmers, S.J. and Claudio M. Radaelli (2004) The Europeanization of National Policy?, Queen's Papers on Europeanization. In: S.J. Bulmer and Chr. Lequesne (eds) Member States and the European Union. Oxford, Oxford University Press.

Commission of the European Communities (1981) Third Environmental Action Programme (1982-1986).Office for Official Publications of the European Communities, Luxembourg.

Commission of the European Communities (1985) White Paper on the completion of the internal market . Office for Official Publications of the European Communities, Luxembourg.

Commission of the European Communities (1986) Fourth Environmental Action Programme (1987-1991). Office for Official Publications of the European Communities, Luxembourg.

Commission of the European Communities (1990a). Green Paper on Urban Environment. Communication from the Commission to the Council and the Parliament [COM(90)218]. European Commission, Brussels.

Commission of the European Communities (1990b). Energy for a New Century. Office for Official Publications of the European Communities, Luxembourg.

Commission of the European Communities (1992a). Towards Sustainable Mobility. Office for Official Publications of the European Communities, [COM(92)494]. Luxembourg.

Commission of the European Communities (1992B) Fifth Environmental Action Programme (1993-2000), Office for Official Publications of the European Communities, Luxembourg.

Commission of the European Communities (1997). Towards an urban agenda in the European Union. Communication from the Commission [COM(97)197]. European Commission, Brussels

Commission of the European Communities (2001a). European Transport Policy for 2020: Time to Decide [COM(2001)370]. Office for Official Publications of the European Communities, Luxembourg.

Commission of the European Communities (2001b). A sustainable Europe for a Better World: a European Union Strategy for Sustainable Development.

Communication of the European Commission [COM(2001)264]. European Commission, Brussels.

Commission of the European Communities (2001c). European governance: a white paper [COM(2001)428]. Office for Official Publications of the European Community.

Commission of the European Communities (2001d). Communication "The Clean Air for Europe (CAFE) Programme: Towards a Thematic Strategy for Air Quality" [COM(2001)245] Office for Official Publications of the European Community.

Commission of the European Communities (2004). Towards a thematic strategy on the urban environment [COM(2004)60]. Office for Official Publications of the European Community.

Commission of the European Communities (2005a). Green paper on Energy Efficiency or Doing More With Less [COM(2005)265] Office for Official Publications of the European Community.

Commission of the European Communities (2005b). Biomass Action Plan [COM(2005)628] Office for Official Publications of the European Community.

Commission of the European Communities (2005). Directive on Ambient Air Quality and Cleaner Air for Europe (the “CAFE” Directive) [COM(2005)] Office for Official Publications of the European Community.

Commission of the European Communities (2006). Keep Europe moving – sustainable mobility for our continent. Mid-term review of the European Commission’s 2001 Transport White paper [COM(2006)314]. Office for Official Publications of the European Community.

Committee on Spatial Development (1999). European Spatial Development Perspective. Towards Balanced and Sustainable Development of the Territory of the European Union. Office for Official Publications of the European Communities, Luxembourg .

Council of the European Union (2006). Renewed EU Sustainable Development Strategy. Document 10117/06. Council of the European Union, Brussels.

Expert Group on the Urban Environment (1996). European Sustainable Cities. Report of the Expert Group on the Urban Environment. European Commission, DGXI (Environment, Nuclear Safety and Civil Protection), Brussels.

Geerlings, H. (ed)., S. Bos, M. van Meijeren en B. Pents (2005) Transport en Duurzaamheid; een verkenning van de stand van zaken in beleid en onderzoek vanuit een historisch perspectief. Een essay t.b.v. Transumo Rotterdam (26 pp).

Geerlings, H. en D. Stead (2003) The integration of land use planning, transport and environment in European policy and research. In: Transport Policy. Vol.10, pp 179-196.

Joint Expert Group on Transport and the Environment and Commission of the European Communities (1999). Integrating the Environmental Dimension. A Strategy for the Transport Sector. Commission of the European Community, Brussels.

OECD (2001a). Policies to enhance sustainable development. OECD, Paris.

OECD (2001b). Sustainable development: critical issues. OECD, Paris.

Stead, D. and H. Geerlings (2005) Integrating transport, land use planning and environment policy in Denmark, Germany and England: from theory to practice. In: Innovation in Social Sciences. Vol.18(4), pp 443-453.

Stead D. (2006) Mid-term review of the European Commission's 2001 Transport White Paper. In: European Journal of Transport and Infrastructure. Vol.6(4).

United Nations (1992). Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992. Volume I: Resolutions Adopted by the Conference. United Nations, New York.

Appendix 1. Chronology of developments in Europe on the integration of environmental issues into other areas of policy from 1990[i]

First wave: Commitment to sustainable development (early 1990s)

1991: Member States sign the Maastricht Treaty. Article 130R commits Member States to sustainable growth and policy integration. It states that 'environmental protection requirements must be integrated into the definition and implementation of other Community policies'.

1992: United Nations Conference on Environment and Development (Rio de Janeiro).

1992: Fifth Environmental Action Programme (1993-2000) gives special attention to integration in five target sectors: agriculture, transport, tourism, energy and industry.

Second wave: Strengthening of integration (mid 1990s)

1997: UN Special Session of the General Assembly (UNGASS) Rio+5 reaffirms the political commitment to achieve the Rio objectives.

1997: Member States sign the Amsterdam Treaty. Article 2 identifies sustainable development as a key task. Article 6 states that 'environmental protection requirements must be integrated into the definition and implementation of the Community policies and activities... in particular with a view to promoting sustainable development'.

1997: The European Council in Luxembourg agrees an initiative to begin the integration process and request the European Commission to develop a strategy for Cardiff.

Third wave: The Cardiff Process (late 1990s onwards)

1998: The European Council in Cardiff identifies the first round of councils to develop integration strategies and indicators (transport, energy and agriculture).

1998: The European Council in Vienna identifies the second round of councils to develop integration strategies and indicators (internal market, industry and development). The Council requests the Commission to prepare reports on the environmental appraisal of major policy proposals and indicators of integration.

1998: The European Parliament issues a resolution on integration.

1999: The European Council in Cologne identifies the third round of councils to prepare integration strategies (fisheries, Ecofin and general affairs).

1999: Adoption of the European Commission's Communication on the EU's climate change strategy.

1999: The European Council in Helsinki reviews overall progress on integrating environment and sustainable development and invites the European Commission to 'prepare a proposal for a long-term strategy dovetailing policies for economically, socially and ecologically sustainable development'.

2000: The European Council in Gothenburg agrees a strategy for sustainable development and asks that 'all major policy proposals include a sustainability impact assessment covering their potential economic, social and environmental consequences'.

2002: The European Council in Barcelona states that 'growth today must in no event jeopardise the growth possibilities of future generations... Economic, social and environmental considerations must receive equal attention in policy-making and decision taking processes'.

---

[i] Based on information from the European Commission at http://www.europa.eu.int/comm/environment/enveco/integration/integration.htm.

European Transport \ Trasporti Europei n. 39 (2008): 33-43

The Development of Transport in the Czech Republic

L. Beneš [1*], E. Březina, J. Bulìček, V. Mojžiš

[1] *University of Pardubice*
Jan Perner Transport Faculty, Czech Republic

Abstract

Before 1989, transport in the former Czechoslovakia met its tasks based on the controlling principles of planned economy, focused eastwards and oriented on cooperation between the Eastern Bloc countries within COMECOM. Due to the preference for raw material extraction and heavy industry, the transport sector dealt mainly with transporting commodities of these branches with high demands in volume. The planned economic principles were also reflected by the consistent division of transport work with a preference for stack substrate transport by rail.

The change of the political and economic circumstances in November 1989 influenced the life and needs of society substantially. A market economy has come, focused on the market of developed European countries and having an impact on the transport sector as such, individual transport systems, transport preferences and transported commodities [2].

As at 1 January 1993, Czechoslovakia has been divided into two independent countries, i.e. the Czech Republic and Slovakia. Therefore the following data from the Transport Statistics of the Czech Republic [1] are comparable starting from 1994. The authors of the article had data available until 2006.

Keywords: Transport, Development trends, Commodities, Statistics.

---

1. Development of transport from 1994 to 2006

In freight transport, there was an overall decrease in this period (Picture 1, Table 1), as well as a change from the East – West direction to the West/North – South direction and the change of transport labour division (the split model). After the breakup of Czechoslovakia, the average transport distance was shortened, with a negative impact on railway transport. From the macroeconomic point of view, a decrease in transport demands was (and still is) desirable, expressed at the ratio of transport in the overall economic production of the economy. The split model was also disadvantageous, bringing a substantial decrease of railway transport in favour of road transport with all

---

* Corresponding author: Libor Beneš (libor.benes@upce.cz)

the resulting consequences, i.e. a gradual overloading of roads, more accidents and the negative environmental impact. In domestic water transport, the situation did not change in this period, i.e. the share of this kind of transport in overall transport is more or less insignificant. Also the share of air transport was insignificant, even though the trend was on the increase [3].

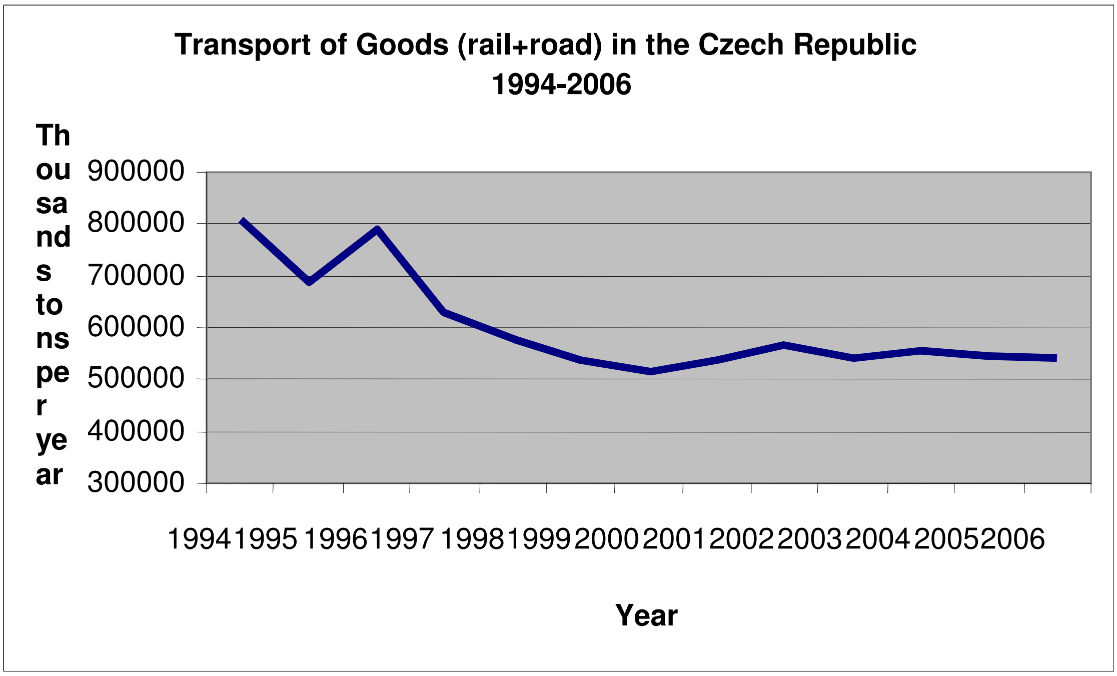


Figure 1: Freight transport in the Czech Republic from 1994 - 2006. Source: [1].

Table 1: Transport of Goods in the Czech Republic.

Transport of Goods in the Czech Republic (thousands of tons per year)

Year	1994	1995	1996	1997	1998	1999
Rail	110,012	108,871	107,235	111,379	104,788	90,735
Road	701,699	578,796	685,744	521,482	470,888	448,300
Total	811,711	687,667	792,979	632,861	575,676	539,035

Year	2000	2001	2002	2003	2004	2005	2006
Rail	98,255	97,218	91,988	93,296	88,843	85,612	97,491
Road	414,724	438,675	474,883	447,955	466,035	461,145	444,573
Total	512,979	535,893	566,871	541,251	554,878	546,757	542,064

Note: Source: [1].

In passenger transport, there was a substantial shift from public transport, both rail and road, to individual road transport (Picture 2, Table 2). There were negative consequences in growing traffic-jams, unsatisfactory safety conditions and growing damage to the environment. Therefore, more attention is paid to acceptable mobility, combined with the regulatory measures imposed by the state and municipalities, leading to sustainable transport. Also the trend of municipal mass transport was decreasing. In water transport, its recreational character clearly prevailed. In air transport, the number of transported passengers grew steadily and relevantly.

The coordination of individual transport systems was (and still is), by the broadening integrated transport systems, improving the quality of transport availability. These systems gradually included municipal mass transport pursuant to the EU Directive on public services.

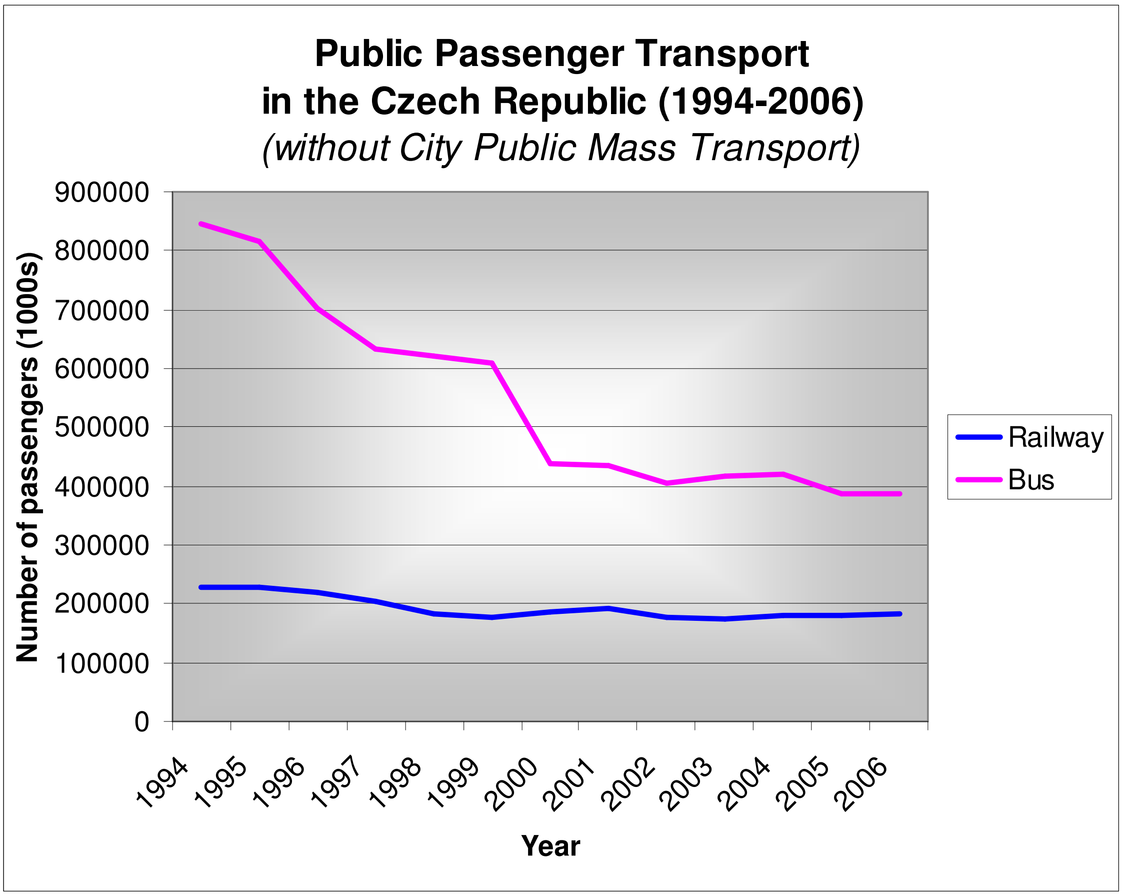


Figure 2: Pubic passenger transport in the Czech Republic (1994 - 2006). Source: [1].

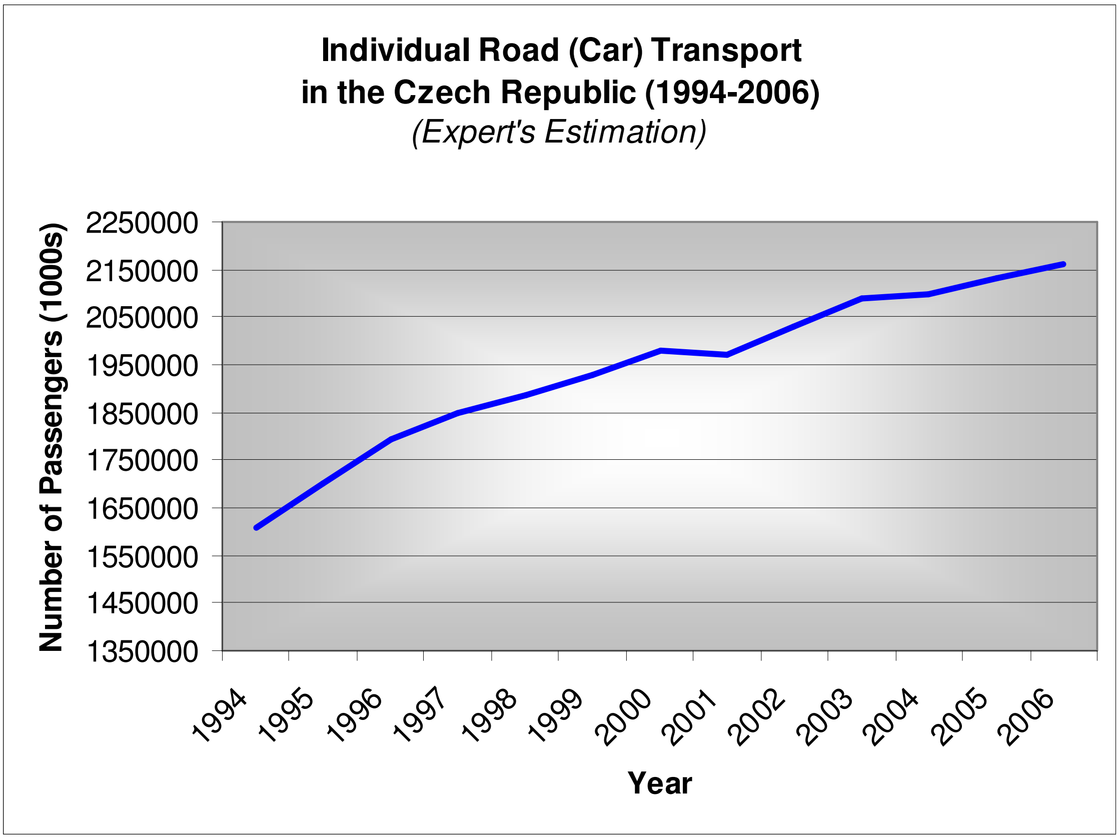


Figure 3: Individual road (car) transport in the Czech Republic (1994 - 2006). Source: [1].

Table 2: Passenger Transport in the Czech Republic (1994 - 2006).

Passenger Transport in the Czech Republic, 1994 - 2006 (in number of passengers - thousands).

Year	1994	1995	1996	1997	1998	1999
Railway - Total	228,719	227,147	219,244	202,894	182,944	177,046
Public Bus Transport	845,500	817,200	702,235	633,873	622,394	608,331
City Public Mass Transport	2,563,000	2,230,000	2,216,000	2,235,000	2,175,000	2,264,000
Individual Road Transport*	1,608,000	1,700,000	1,795,000	1,850,000	1,885,000	1,930,000

Year	2000	2001	2002	2003	2004	2005	2006
Railway - Total	184,735	190,748	177,232	174,179	180,949	180,266	183,027
Public Bus Transport	438,878	435,913	406,097	417,012	418,598	386,415	387,708
City Public Mass Transport	2,289,700	2,343,700	2,338,700	2,302,200	2,309,600	2,268,900	2,238,000
Individual Road Transport*	1,980,000	1,970,000	2,030,000	2,090,000	2,100,000	2,130,000	2,160,000

Note 1: * expert's estimation.
Note 2: Source: [1].

1.1. Railway transport

The political and economic changes had an immense impact on railway transport, both external, i.e. restructuring the national economy, and in transport itself. From the transport sector as a whole, production, assembly and repair activities were separated first and privatized subsequently. At that time, railway transport consisted of unitary railways, taking care of the transport infrastructure and railway transport in one accounting system. Therefore in the 1990s, these were separated in the sense of accounting, in accordance with the EU directive.

The state organization Czech Railways was established as at 1 January 1993, with the breakup of Czechoslovakia. Ten years later, transformation led to establishing the stock company Czech Railways as a transport company and the state organization Railway Infrastructure Administration as an infrastructure administrator. This act fulfilled the EU directive to separate both institutions physically.

In the following years, the stock company Czech Railways left to its subsidiaries, who numbered eighteen in 2007, all activities not directly connected with its main activity. In late 2007, a part of the main activity – freight transport – was separated into the independent stock company CD Cargo. At present, the separation of passenger transport, also the main activity, into another independent subsidiary is being prepared.

Due to the restructuring steps performed, the number of employees decreased substantially from 116,000 in 1993 to one half, i.e. 58,000 in 2006. A further decrease followed in 2007 with the separation of the freight carrier CD Cargo, a.s., and the same can be followed after the separation of passenger transport.

Freight transport decreased from 110 million tons in 1994 to 97 million tons in 2006 (Picture 3, Table 3), with a substantial decrease from 1998 to 1999, linked with the total drop of the gross domestic product. Despite some fluctuations in 1990s, the trend in transit transport was rising slightly. The structure of transported goods changed from stack substrates to goods with a higher value and lower specific weight. The share of railway freight transport in total transport was approximately 25 per cent. In 2007, there was a slight increase in railway freight transport, as preliminary data show. The cause was a partial shift from the overloaded road transport to the railway.

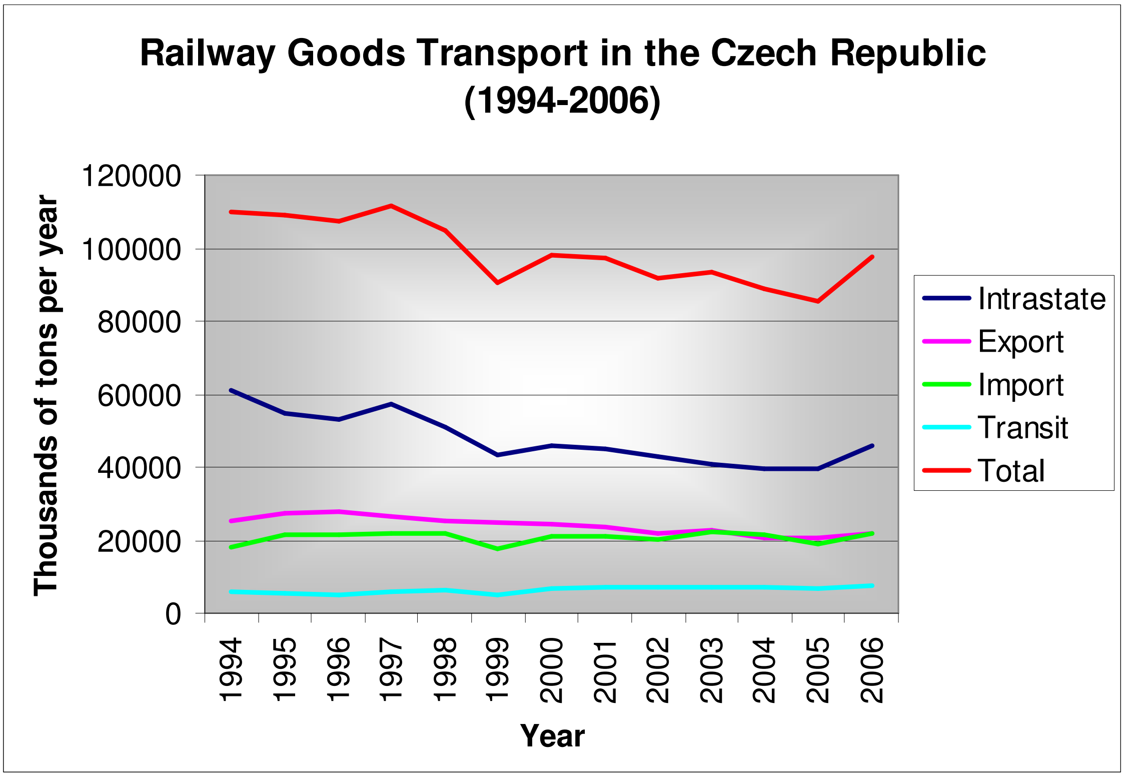


Figure 4: Railway freight transport in the Czech Republic (1994 - 2006). Source: [1].

Table 3: Railway transport of goods in the Czech Republic (1994 - 2006).

Railway Transport of Goods in the Czech Republic (1994 - 2006) (Thousands of tons per year).

Year	1994	1995	1996	1997	1998	1999
Total	**110,012**	**108,871**	**107,235**	**111,379**	**104,788**	**90,735**
Intrastate	60,926	54,562	53,192	57,187	51,075	43,229
International - total	**49,086**	**54,309**	**54,043**	**54 192**	**53,713**	**47,506**
Export	25,228	27,246	27,627	26,441	25,415	24,661
Import	18,157	21,466	21,277	21,942	22,053	17,627
Transit through CZ	5,701	5,597	5,139	5,809	6,245	5,218

Year	2000	2001	2002	2003	2004	2005	2006
Total	**98,255**	**97,218**	**91,988**	**93,296**	**88,843**	**85,612**	**97,491**
Intrastate	46,039	45,196	42,741	40,849	39,765	39,506	45,861
International - total	**52,216**	**52,022**	**49,247**	**52,447**	**49,078**	**46,106**	**51,630**
Export	24,582	23,760	21,913	22,692	20,456	20,523	21,924
Import	20,908	21,167	20,301	22,442	21,321	18,907	22,057
Transit through CZ	6,726	7,095	7,033	7,313	7,301	6,676	7,649

Note: Source: [1].

Railway passenger transport also decreased dramatically in the studied period, from 229 million passengers in 1994 to 183 million in 2006 (Picture 2, Table 2). The share of railway passenger transport in the total number of transported passengers was approximately 6.5 per cent. The main reason for the decrease in passenger railway transport was the dynamic rise of individual auto transport. However, the preliminary statistical data for 2007 show that the number of passengers transported by the railways rose slightly. This change was a result of the improved transport culture due to the new means of transport in public mass transport and the rising fuel prices.

The transport infrastructure modernization received a contribution by the completion of construction of national railway corridors I and II and the commencement of construction of national corridors III and IV. Reconstruction of the main railway stations and junctions not included in the corridor construction is ongoing. This results in increasing speed, capacity and quality of travel.

Replacement of the ageing rolling stock started in both freight and passenger coaches.

In replacement of freight cars, it was important that Czech Railways got their share in the international organization EUROFIMA, financing the replacement of rolling stock of many European railways. Separating freight transport into the company CD Cargo, a.s., allowed financing replacement of its rolling stock from the profit of this company.

The replacement of rolling stock in passenger transport was resolved by deploying PENDOLINO units with a tilting car body, continuing deliveries of engine units CITY ELEFANT for commuter transport and modernization of REGIONOVA units for regional transport. To replace rolling stock in passenger transport, the government of the Czech Republic adopted the strategic document “Programme of the Renovation of Railway Rolling Stock in Passenger Transport”.

Passing the amendment to Act No. 266/1994 Coll., the Railway Act, created equal conditions for conducting railway transport by all carriers on the basis of national law, complying with the EU legal regulations. This fact allows increasing the service quality due to competition between various railway transport providers.

1.2. Road transport

Road transport was privatized in the early 1990s from the former national companies of Czechoslovak Automobile Transport into separate private companies in both bus and freight transport. At present, there is no state-run company in road transport and approximately 35,000 transport companies with more than 150,000 employees are registered. However, some carriers only own one or a few vehicles, vehicles ageing both physically and technically. One serious and long-term problem is the unsatisfactory situation in road traffic safety, although it was improving moderately (in 2005, 25,239 accidents and 1,286 people killed were recorded; in 2006 it was 22,115 accidents and 1,063 people killed). In connection with the Czech Republic’s accession to the European Union as at 1 May 2004, transit road freight transport increased sharply, with a negative impact on the environment.

The number of passengers in road public transport in 1994 was more than 845 million passengers; after ten years, in 2004, it decreased to less than half, i.e. 418 million passengers. This decreasing trend continues. In 2006, less than 388 million passengers were transported (Picture 2).

A similar trend can be seen in freight transport. While more than 701 million tons of goods were transported in 1994, it was only 398 million tons in 2006 (Picture 4).

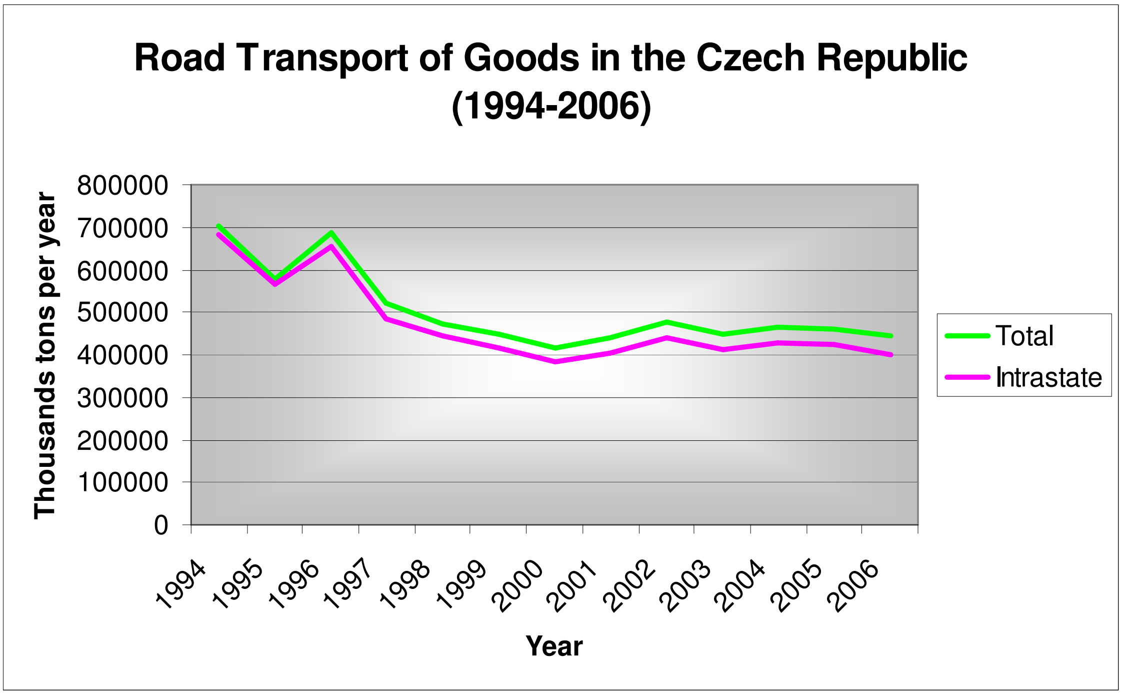


Figure 5: Road transport of goods in the Czech Republic (1994 - 2006). Source: [1].

Roads, previously owned entirely by the state, were subject to Act No. 132/2000 Coll., to change acts connected with the Act on Regions and Municipalities, dated 1 January 2001; motorways and trunk roads (1 class) are still owned by the state, administered through the state company Road and Motorway Directorate, and major main and main roads (2nd and 3rd class) are owned by regions, administered through the Road Administration and Maintenance of individual regions. In general, the condition of roads is poor, especially that of bridges.

1.3. Municipal mass transport

A similar trend to public railway and road transport was manifested in municipal mass transport. While in 1994 2.563 million passengers were transported, it was only 2.348 million passengers in 2006 (Table 4), i.e. a decrease of 338 million passengers. Preliminary statistical data for 2007 demonstrate a further decrease in favour of individual car transport.

Table 4: Number of passengers in city public transport in the Czech Republic (1994 - 2006) (thousands of tons per year).

Year	*Number of Passengers (thousands)*	*Year*	*Number of Passengers (thousands)*
1994	2,563 000	2001	2,343,700
1995	2,230 000	2002	2,338,700
1996	2,216 000	2003	2,302,200
1997	2,235 000	2004	2,309,600
1998	2,175 000	2005	2,268,900
1999	2,264,000	2006	2,238,000
2000	2,289,700		

Note: Source: [1].

1.4. Air transport

On the other hand, air transport in the Czech Republic increased dramatically after 1993.

In passenger transport, the total number of passengers in 2006 was 12.44 million, with the greatest share at the largest airport, Prague – Ruzyne. Some problems with transporting passengers between the Prague centre and this airport remained, caused by the long-delayed construction of a railway line in this relation.

In air freight transport, 22,000 tons were transported in 2006.

The national air carrier Czech Airlines was privatized and more carriers were established subsequently, both charter and low-cost carriers.

Airports in Brno, Ostrava and Karlovy Vary were privatized. The Prague – Ruzyne airport is still owned by the state; its privatization is being prepared and it will be the biggest privatization event of the current period (estimated at approximately CZK 100 billion, i.e. approximately EUR 4 billion).

1.5. Water transport

In individual water transport, recreational transport prevailed significantly. In freight transport, the transport of coal from North Bohemia to the Chvaletice power plant in East Bohemia stopped, and in 2006, water transport represented approximately 2 million tons of goods, of the total freight transport amounting to 555 million tons.

There are certain problems in making navigable the short section of the Elbe River from Prelouc to Pardubice and from Usti nad Labem to the Czech-German border due to protection of the environment [4].

1.6. Individual car transport

The opposite trend in comparison with public transport is displayed in individual auto transport. Based on experts' statistical estimation, approximately 1.608 million people used cars in 1994; this number was 2.160 million in 2006 (Table 5).

Table 5: Number of passengers in individual transport in the Czech Republic.

Year	*Number of Passengers (thousands)*	*Year*	*Number of Passengers (thousands)*
1994	1,608,000	2001	1,970,000
1995	1,700,000	2002	2,030,000
1996	1,795,000	2003	2,090,000
1997	1,850,000	2004	2,100,000
1998	1,885,000	2005	2,130,000
1999	1,930,000	2006	2,160,000
2000	1,980,000		

Note 1: Experts' estimation only.
Note 2: Source: [1].

2. Status of the harmonization of rail and road transport and infrastructure financing

From the point of view of competition between two major types of transport, i.e. rail and road transport, there is no condition of harmonization of their enterprise in terms of the infrastructure use. While the infrastructure use in railway transport has been paid since 1st January 2003, payment is partial only in road transport. One positive step in this area was the introduction of tolls on motorways and high-speed roads for road vehicles over 12 tons as at 1st January 2007 and on some 1st-class roads as at 1st January 2008. Other road vehicles, including cars are still subject to paying the highway fee in the form of highway stickers.

To finance the financial infrastructure, the State Fund for Transport Infrastructure with its own yearly budget was established by government decree. With respect to the poor condition of the infrastructure, the budget is insufficient and new sources of financing must be sought.

3. Expected development in transport

Further development in passenger transport will be influenced, among other things, by the prepared Act on public transport, as well as by carrier coordination by means of introducing, broadening and deepening more integrated transport systems

In freight transport, we can expect a partial shift from road to railway transport, a substantial growth of intermodal transport and more steps in the harmonization of the transport infrastructure conditions.

In railway transport, more important changes can be expected, connected primarily with the ongoing liberalization. A substantial increase of railway transport competitiveness is foreseen, thanks to the railway infrastructure modernization and replacement of rolling stock in both passenger and freight transport. By passing the prepared amendment to Act No. 266/1994 Coll., the Railway Act, equal conditions for operating railway transport will be created for all carriers on the basis of national law, corresponding to the EU legal regulations. This fact will allow increasing the quality of service thanks to competition between various operators of railway transport. The number of passengers in railway transport will probably grow slightly in long-distance and commuter railway passenger transport. The present studies and projects of high-speed transport create a basis for its implementation, based on financial resources in the acceptable future.

In road transport, no organizational changes can be expected. The existing trends will probably endure in passenger and freight transport. More motorways and high-speed roads will be under construction.

In municipal mass transport, a slight increase can be expected in the number of passengers, connected with more frequent traffic-jams (not only in built-up areas) and growing fuel prices.

In air transport, further increase of the number of passengers is expected, continuing modernization and prepared privatization of the Prague – Ruzyne Airport and construction of a railway line between the Prague centre and this airport.

Further development of water transport will probably be influenced by the enduring negative opinion of the Ministry of the Environment on resolving the Elbe River navigability.

The trend of increasing individual auto transport will continue. However, this can be influenced negatively by the rising fuel prices and measures against the worsening condition of the environment.

4. Conclusions

The presented facts show that transport has experienced complicated and dynamic development from the establishment of the Czech Republic until today. Most changes performed were beneficial for meeting transport demands in domestic and international dimensions. The existing problems are similar to many countries of the European continent. In future, it is necessary to focus on the effective use of various transport systems in their mutual relationships, with an emphasis on quality, lower energy demands and environmental protection. The transport infrastructure must be improved as well. Financing will be of special importance in this.

References

[1] Statistics of transport in the Czech Republic [online]. Ministry of Transport of the Czech Republic [cit.: 2007-12-19]. Accessible from: www.sydos.cz.

[2] Author's collective: History of transport in the Czech Republic. Jan Perner Institute, beneficiary association, Prague 2006, 146 p., ISBN 80-903184-9-5.

[3] MOJŽÍŠ, V. – BŘEZINA, E.: Ekonomika a doprava – trendy a tendence [CD-ROM]. In: Proceedings of 7th International Conference “TRANSPORTATION SYSTEMS AND THEIR NATIONAL ECONOMY ASPECTS (2007) “, Prague 2007, ISBN 978-80-01-03706-5.

[4] Transport in CR 2000. Ministry of Transport and Communications, Prague 2002, 23 p.

[5] Transport Policy of the Czech Republic for 2005 – 2013. Ministry of Transport of the Czech Republic, Prague 2005, 60 p.

European Transport \ Trasporti Europei n. 39 (2008): 44-58

Port Authorities as cluster managers: the case of the Ligurian ports

O. Baccelli [1*], M. Percoco [2], A. Tedeschi [1]

[1] *CERTeT*
Bocconi University
Piazza Sraffa 11 - 20136 - Milano

[2] *Department of Institutional Analysis and Public Management*
and CERTeT
Bocconi University

Abstract

The paper analyses the role of Port Authorities as cluster managers able to generate resources for investments with benefits for the intermodal transport chain as a whole. Assessment is made of Port Authority initiatives to foster the development of intermodality and the creation of dry ports. The framework proposed is then applied to the case of the Ligurian ports, which compete less as individual structures than as nodal points within integrated logistic chains. We argue that the integration of the land logistic interface may prove beneficial to the Ligurian ports, and that this can be achieved only if the Port Authorities act as cluster managers.

Keywords: Port governance, Cluster management, Italian ports.

---

1. Introduction

The inland leg is becoming ever more crucial in an increasingly globalised world in which competition among ports no longer takes place solely at the level of the services supplied and the handling speed of goods within the port area. For it also, and above all, depends on the frequency and reliability of connections with the hinterland which enable the express forwarding of goods to their destinations. It is particularly important to consider the logic whereby the advantages deriving from geographic localization are flanked by the quality, availability and functionality of the logistic services offered by

---

* Corresponding author: Oliviero Baccelli (oliviero.baccelli@unibocconi.it)

the port of call. Important contributions to the study and understanding of this topic include Notteboom (1997), and Notteboom and Winkelmans (2001), who argue that geographical conditions do not completely explain port performance because other factors such as hinterland connections, terminal productivity, and a port's reputation are of key importance as well. As a consequence, competition takes place not only among single companies but also among entire supply chains (Harrison and Van Hoek, 2002).

The rapidly expanding volume of global trade has been driven by the innovation introduced by containerization, which has led to evolution of the supply chain (Levison, 2006). In fact, containerized traffic is undergoing high growth rates which are not expected to fall in the near future. Moreover, significant operations of concentration and horizontal integration have occurred in the sector, bringing about even more pronounced growth in the containerized transport market. This, in its turn, has strengthened the role of technology and increased investments in fleets (Beckers, 2006; De Monie, 2006; Penfold, 2006). In this context, shipping companies have begun to seek economies of scale by increasing the average size of their vessels (Cullinane and Khanna, 2001). In fact, in 2001 ships delivered and utilized on the Europe-Asia route had an average capacity of 5,000 TEU, while by 2006 this value had grown to 7,000 TEU. From a financial viewpoint, a 12,500 TEU vessel permits a saving at sea of some 29% compared with a 6,500 TEU vessel (Cazzaniga Francesetti, 2005).

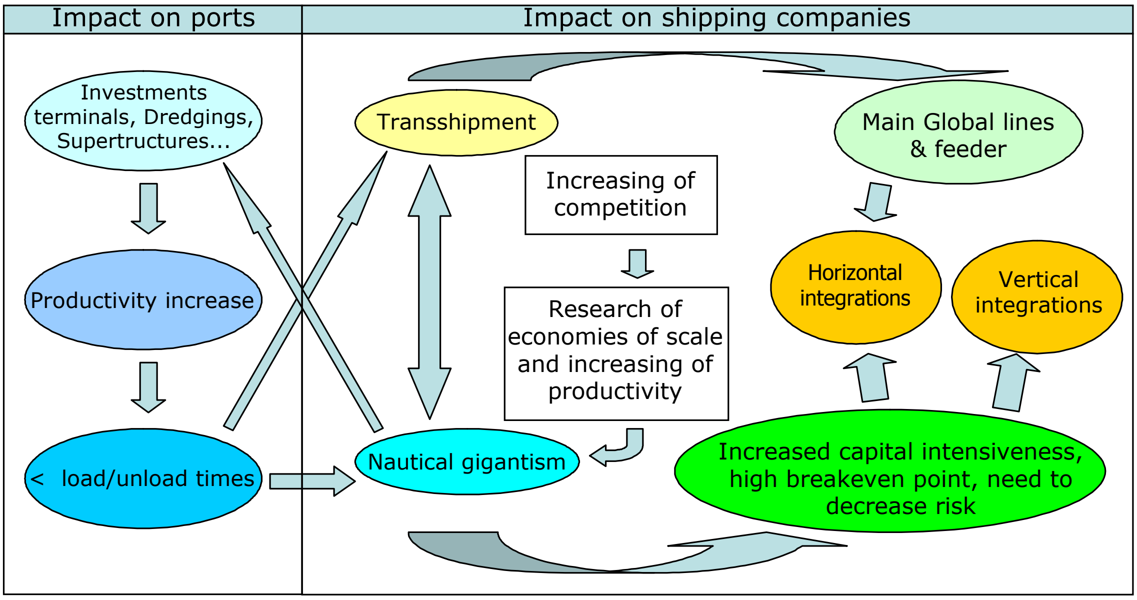

Impact on ports
Impact on shipping companies
Investments terminals, Dredgings, Supertructures...
Productivity increase
< load/unload times
Transshipment
Nautical gigantism
Increasing of competition
Research of economies of scale and increasing of productivity
Main Global lines & feeder
Horizontal integrations
Vertical integrations
Increased capital intensiveness, high breakeven point, need to decrease risk

Figure 1: Liner shipping development and outcomes.

All these trends have also had repercussions in the port sector. As argued by Jansson and Schneerson (1987), economies of ship size are enjoyed at sea and diseconomies of ship size are suffered in port. As can be seen from figure 1, large vessels and a greater use of transshipment compel ports to make greater investments in dredging, dock features, information technology, cranes, and superstructures in general. The need to have such particular, expensive and standardized facilities has induced direct investments in container terminals both by some of the main shipping companies and by specialized worldwide terminal operators. Consequently, while the ability to handle traffics and port productivity grows, the time that vessels spend in ports decreases, which encourages even greater transshipment and the use of even larger ships.

Turnaround times (port access, manoeuvre and berthing operations, and the handling times of loading and unloading) are constantly improving. All these phenomena are enabling ports and terminals to achieve substantial productivity increases, with the consequent price reductions (Myung-Shin, 2003).

This paper focuses on the Ligurian ports, which have become crucial in this period due to the expansion of industrial production in the Far East and of trade with Europe, so that the Mediterranean has become once again the center of one of the main lines (Far East – Europe).

Ligurian ports are facing important challenges by relying on proposals for financial autonomy and the involvement of some of the main global container operators in the creation of new infrastructures and facilities. This article proposes a new role for the Port Authorities (henceforth PAs), namely as port cluster managers acting to generate resources for investments mainly via partnerships and coordination among cluster agents (De Langen, 2003). The voluntary investment made by a single port is too often smaller than the optimal amount of investments necessary for the entire intermodal transport chain (i.e. the optimal investment level for the cluster) where the marginal benefits of additional investments are equal to the marginal cost of additional investment.

The paper is organized as follows. Section 2 outlines a simple model of cluster firms behavior in which the undercapitalization problem is highlighted. Sections 3 and 4 describe the governance of Italian ports and the case of the Ligurian ports respectively. Section 5 concludes.

2. Some simple economics of port clusters

The literature on seaport clusters has been steadily growing over the past years, so that we currently have some relevant examples of maritime clusters serving as ideal benchmarking for the Ligurian ports analyzed in the present paper.

De Langen and Visser (2005) propose a comparison between Rotterdam and Lower Mississippi seaport clusters. The case of Lower Mississipi shows that collective action regimes are less developed in the cluster, compared with the seaport cluster of Rotterdam. The lack of leading firms is considered to be one of the main reason for the lack of technological innovation. However, although relevant, private firms are not the sole determinant of cluster performance. In fact, public bodies are considered to be key in coordinating investment and in solving problems of free riding. Rodrigue (2003) points out the importance of public sector efficiency to enhance local development induced by the activity of New York and New Jersey ports.

Relevant studies on port clusters include the works by Haezendock (2001) on the strengths and weaknesses of Antwerp's port cluster, Van Klink (1995) on the development of port networks, and Slack (1989) on the location behaviour of the port service industries. Finally, Lee and Rodrigue (2006) propose an interesting analysis on the the effects of trade reorientation on Regional Port Systems in Asia.

Before presenting our arguments on the Ligurian ports, we propose an admittedly very simple model of port cluster, the sole purpose being to highlight the problem of suboptimal capital stock due to positive externalities in a cluster.

In recent decades the port industry has become even more capital intensive. However, as convincingly argued by De Langen (2003), agents operating in a seaport cluster often enter into an under-investment situation. The reason is the likely existence of positive externalities on capital. In what follows, we sketch some simple economics of port clusters in order to clarify certain concepts useful for the analysis of the Ligurian ports.

Let us consider the problem of a firm interested in maximizing the net benefit from capital (*k*), defined as the difference between benefit (*B*) and costs (*C*). This problem can be simply formulated as:

$$\max_k \left[B(k) - C(k)\right] \tag{1}$$

The solution to problem (1) is:

$$B'(k_p) = C'(k_p) \tag{2}$$

where k_p is the private solution, i.e. the level of capital that a firm would choose if it did not consider the presence of externalities. In figure 2, the private solution is represented by point A.

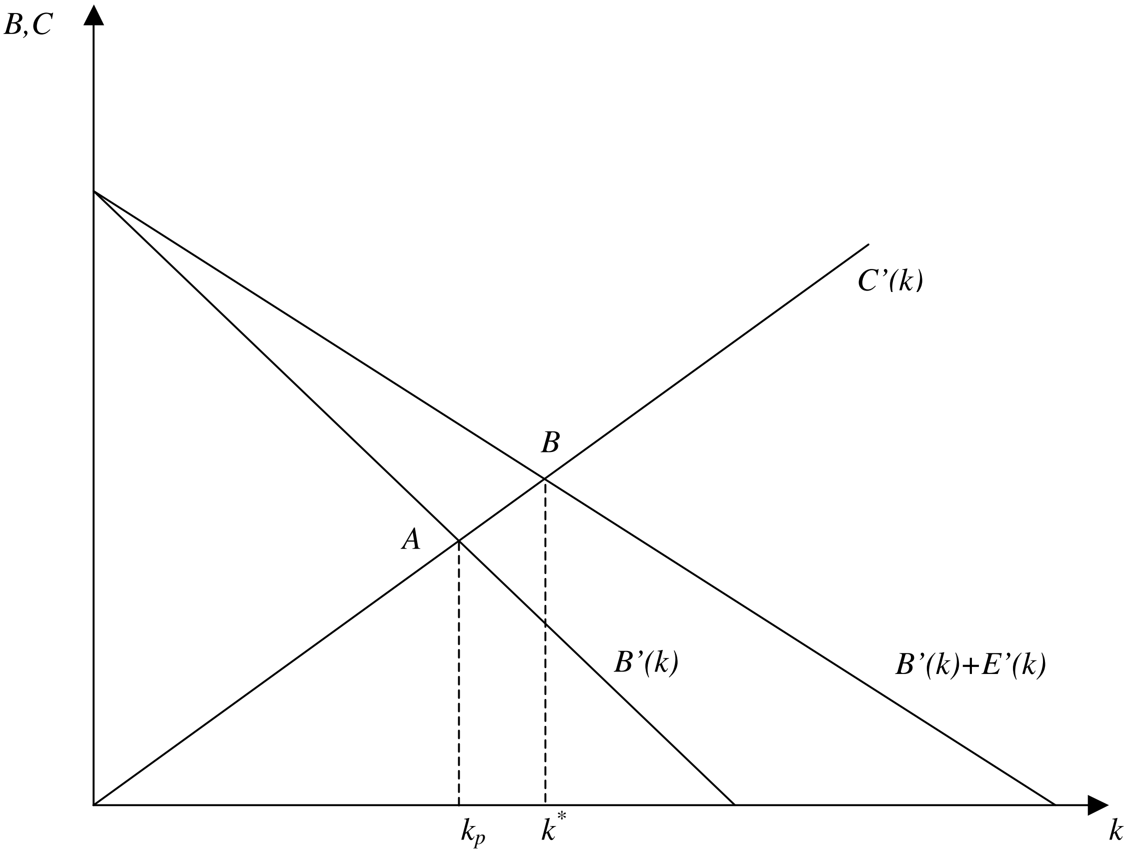


Figure 2: The consequences of positive externalities in port clusters.

However, integration into the production function of firms operating in a port cluster often generates positive capital externalities, as well argued by De Langen (2003). This, in turn, implies that problem (1) can be reformulated as:

$$\max_{k}\left[B(k)+E(k)-C(k)\right] \tag{3}$$

where *E(k)* are positive capital externalities. The solution to (3) is:

$$B'(k^{*})+E'(k^{*})=C'(k^{*}) \tag{4}$$

which corresponds to the social optimum in figure 2. It is also clear from figure 2 that the presence of positive externalities may lead to a sub-optimal level of capital in the cluster, because $k^{*}>k_{p}$. Therefore PAs should be conceived as cluster managers able to coordinate and maximize investments in order to fill the gap between k_p and k^{*}. In fact, as argued by De Langen (2003), an ideal cluster manager should be characterized by:

a) incentives to invest with subsequent direct and indirect investment costs recovery;
b) a budget constraint strictly linked to seaport performance;
c) incentives to participate into public-private partnerships with other stakeholders in the cluster;
d) a commitment to invest only in projects for which coordination failures among firms lead to a clear underprovision of the good.

In order to meet those criteria, the cluster manager should be able to levy a "cluster tax (De Langen, 2003), i.e. its costs should be recovered by revenues as a direct or indirect function of port performance.

However, as will become clear in the next section, the governance of Italian ports is especially complex, and the role of PAs is very limited, unless a necessary reform on PAs financial autonomy is carried out.

3. The Governance of Italian ports

In the previous section we showed that a by-product of positive capital externalities is a relatively low level of capital stock. In this section, we outline current trends in Italian port governance, as well as some reforms currently determining the policy framework.

At present, Italian PAs act as landlord port authorities: the owner maintains ownership over the port, while the infrastructure is leased to private operating companies and services management is subcontracted to private terminal operators or service companies. This model of port management and the company port model (based on complete port privatization in which ownership and service provision are in the hands of the private sector) seems able to conjugate public and private interests with the common goal of port development (Saundry and Turnbull, 1997). The other two models of port governance are the port tool model, in which ownership is public with some port operations undertaken by private operators, and the service port model, in which ownership and service provision are entirely public (Brooks, 2004).

Despite the overall effectiveness of the model adopted in Italy, it has some shortcomings which are currently influencing the maritime policy debate. We summarize the main issues in figure 3.

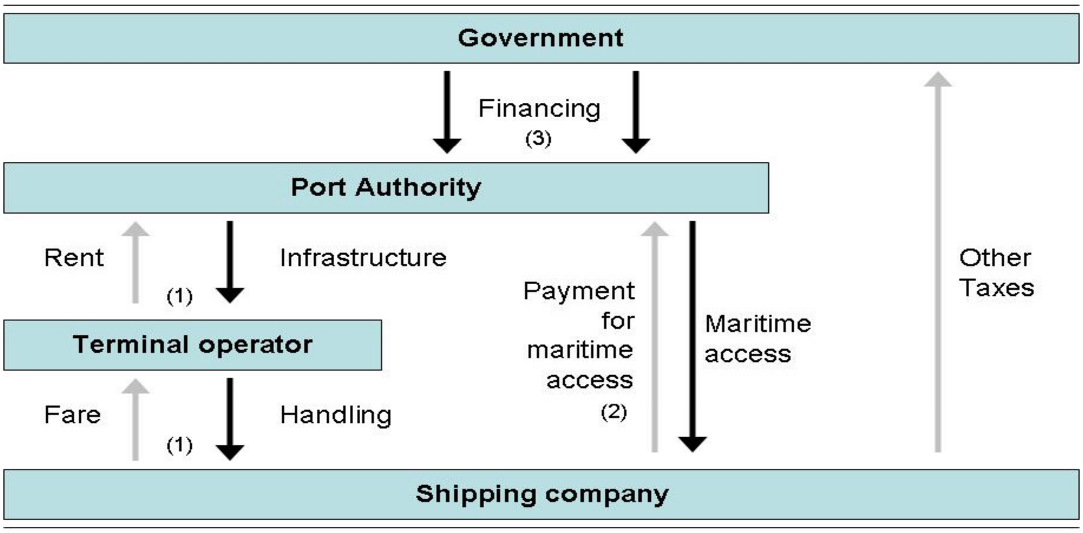


Figure 3: Actors and relations pattern in Italian ports.
Source: Wiegmans *et al.* (2002)

The range of possible PA revenues is defined by art.13 of law 84/94, which establishes PA financial liabilities. The most important are port duty for the embarkation and disembarkation of goods, lease rent for state property ? within the port, and some other subsidies from regional and other local agencies.

The relations between the terminal operator and the shipping company and between the terminal operator and the PA concern economic exchanges of services for fares and rents (link 1 in figure 3). Shipping companies, instead, pay duties to the PA in relation to maritime access and the loading/unloading of goods (link 2). Moreover, almost all the taxes and duties paid by shipping companies (above all: port duty for embarkation and disembarkation, treasury tax for embarkation and disembarkation, anchorage tax) have been collected directly by the PA only since 2007.[1] Previously these taxes were collected directly by the state and then given in return (and in part) to the PA in order to install and maintain the infrastructures guaranteeing access to shipping companies and operability to terminal operators (link 3).

The new system, even if it leaves some taxes in the hands of PAs, is within the meaning of a law that allocates? infrastructural works to the state (art.5 law 84/94), relieving the PA of this duty. The tax revenues of PAs are in fact lower than those of other European ports (Baccelli et al., 2007), and they are not sufficient to finance infrastructural works, which are financed by the state, or latterly by public-private partnerships. Despite the rapid evolution of the shipping market, PAs are still not able fully to meet the demand for port services, mainly because of their inadequate financial endowments and their close dependence on government financing policies. The 2007 Italian Budget Law, however, took some steps towards the financial autonomy of PAs, boosting a process that will enable PAs to invest in and develop new infrastructures. Giving ports greater financial autonomy may contribute substantially to cost recovery through whatever pricing policy? might be deemed appropriate by the ports themselves (Haralambides et al., 2001).

---

[1] Art.163, codicil 982, Budget Law 2007

Devolution of the overall maritime fees collected in the ports (under codicil 982, Budget Law 2007) is a first and significant step in this direction because it generates additional financial resources, mainly coming from maritime traffics. The outcome is a doubling of the current tax revenues at the disposal of PAs. In particular, on the basis of 2005 data, for the three Ligurian ports this law would have meant an increase from approximately 15.4 million euros to approximately 52 million euros. Table 1 shows the differences between the old and the new fiscal regime[2].

Table 1: Port revenues collected by customs offices of Genoa, La Spezia and Savona.

Tax revenues		*New fiscal regime hipotesis*	
Collected by the Government		**Collected by the Government**	
Port duties		*Port duties*	
anchorage tax and surcharge	13,682,047	-	-
50% of port duty and surcharge for embarkation and disembark	9,155,464	-	-
100% of Treasury tax for embarkation and disembark	12,131,730	-	-
Total (A)	*36,016,649*	-	-
Other taxes		*Other taxes*	
Duties	573,158,932	Duties	573,158,932
Other taxes	2,281,709	Other taxes	2,281,709
VAT (B)	*3,327,065,824*	*VAT (B)*	*3,327,065,824*
Collected by Port Authories		**Collected by Port Authorities**	
anchorage tax and surcharge	514,37	anchorage tax and surcharge	13,733,484
50% of port duty and surcharge for embarkation and disembark	9,158,394	100% of Treasury tax for embarkation and disembark	12,131,730
surcharge for goods embarkation and disembark	5,728,225	100% of port duty and surcharge for embarkation and disembark	18,313,858
Total (C)	*15,400,989*	*Total (C)*	*51,417,638*
Total (A+B+C)	***3,953,924,103***	***Total (B+C)***	***3,953,924,103***

Source: Simulations on customs offices data as for 2005.

Moreover, the 2007 Budget Law will have to issue a “decreto attuativo” (implementing decree) in order to fix the quota of tax revenues different from taxes and from port duties (i.e. VAT and custom duties) to be devolved to each PA for infrastructure investment, with the simultaneous abolition of government transfers. This codicil 982 has proved to be particularly important, because the total annual tax revenues generated in the ports of Savona, Genoa and La Spezia amount to approximately 4 billion Euros (table 1). With such an amount, consequently, a few percentage points of this value would enable PAs to use financial leverage in order to undertake major investments.

---

[2] Note that in our analysis we mainly consider the container market. In doing so, we exclude cruises and general cargo, hence we do not consider the possibility of specialization of the ports under consideration. We make this choice mainly because of the overwhelming importance of containers in modern economies and because Port Authorities development plans (especially the one of Genoa) mainly, although not exclusively, consider container terminals development.

To sum up, we have reported that the current system of fiscal devolution in Italy will provide PAs with financial resources that may prove beneficial to them when new investment is necessary. In the next section we argue that PAs are currently required also to act as cluster managers in order to participate in and to coordinate investments.

4. The case of Ligurian Port Authorities

As reported in the previous section, the financial capacity of PAs has been improved by recent legislation, so that PAs now have the means to undertake some of the investment required to support intermodal transport and logistics. However, as in the case of the Ligurian ports, the complexity of investments and the large number of stakeholders, as well as the fact that Liguria is a multi-port region, necessitate substantial coordination among agents.

As stated in section 2, positive externalities give rise to an under-capitalization of the cluster which can be remedied by coordination activity of the PA. In the case of Italy, in fact, financial autonomy is not likely to generate resources sufficient to cover all investment costs. Hence, PAs are currently forming PPPs in order to raise money mainly for logistics centers and inland areas. Involvement in PPPs is certainly only one of the ways in which PAs can coordinate investments (i.e. fill the gap between k_p and k^* in figure 2). In what follows we focus on the Ligurian PAs, which have been proven to be particularly active in this field (Baccelli et al., 2007).

Seaports may generally be regarded as gateways through which goods are transferred between ships and the shore (Goss, 1990; Jansson and Shneerson, 1982; Van Klink, 1995). Improving the hinterland access of seaports is, at least partially, an inter-organisational challenge, because the quality of hinterland access depends on the behaviour of a wide variety of actors, such as terminal operators, freight forwarders, transport operators, and PAs (De Langen and Chouly, 2004). With these considerations in mind, PAs are seeking to promote intermodal transport and logistics through the initiatives reported in table 2. These initiatives take mainly the form of agreements between railway companies and PAs and partnerships promoting intermodality, but also investments in logistic centers or inland areas and company shareholdings. The Ligurian PAs are quite active in this sector, and so too are the ports of Trieste, Venice and Taranto.

Table 2: Synthesis of Port Authorities initiatives for intermodality and logistics promotion.

	Participations in societies		*Agreements between Railway companies and Port Authorities*	*Partnership in society of promotion of intermodality*	*Investments in logistic centers or inland areas*	*Other activities*
	With Railway partners	*Establishment of a new company*				
Ancona			√			
Bari				√		
Carrara					√	
Civitavecchia			√			
Genova			√	√	√	
Gioia Tauro			√			
La Spezia			√	√	√	
Napoli	√			√		
Piombino					√	
Ravenna						√
Salerno				√		
Savona		√	√	√	√	√
Taranto			√	√	√	√
Trieste	√	√	√	√	√	√
Venezia	√	√	√	√	√	√

Source: Authors' elaborations on information from newspapers, magazine and direct inquiries as in September 2006.

The three Ligurian ports (Genoa, La Spezia and Savona) together account for more than 18.5% of overall national traffic (12% of maritime cabotage). Moreover, the Ligurian ports handle approximately 65% of Italian containerized traffic (transshipment excluded): in 2005 they handled approximately 90 million tons of goods (among which 42 million tons of general cargo), 2.8 million TEU and 4 million passengers, in 50 specialized terminals able to serve any type of vessel and good.

New investments (to improve port capacity) are currently pushing the Ligurian ports to improve their inland connectivity. The Ligurian PAs are at the core of an innovative process that consists in increasing terminal capacity and in enhancing intermodal transport and logistics through investments in railways and intermodal centers (figure 4).

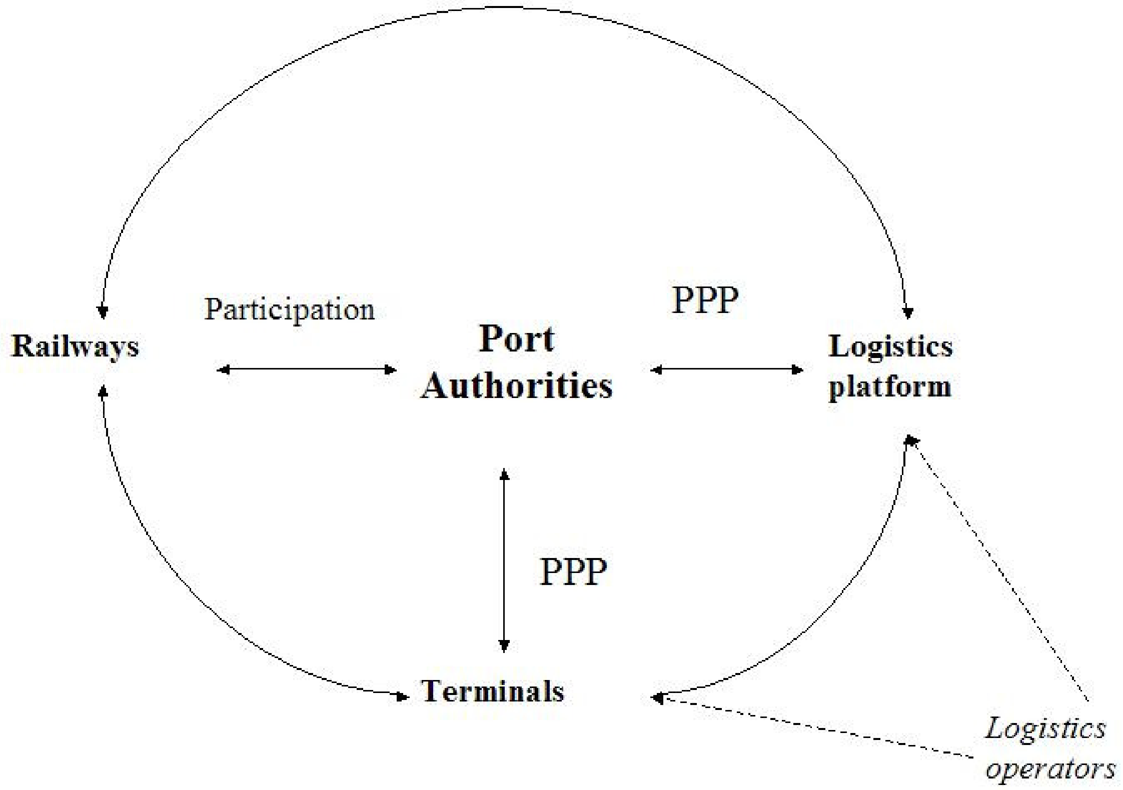


Figure 4: The role of Port Authorities.

For example, A.P.M. Terminals, which belongs to Maersk Group, plans to establish its North Tyrrenian home port at Savona Vado and to build a new container terminal in partnership with the Savona Port Authority. The project has already been approved by the local and central public administrations and it is included in the Port Master Plan. Maersk envisages investing about 100 million Euro in superstructures plus 50 million Euro in infrastructural works in this terminal, whilst the Savona Porth Authority is expected to invet a further 300 million. The final project was presented in summer 2006 and work will begin in 2008. This new container terminal will be located in the area of Vado Ligure and its capacity should be about 600,000 TEUs.

MSC has made investments in Genoa's Calata Bettolo, and the Eurogate Group, through its subsidiary Contship, is planning a major expansion of La Spezia's terminal areas. All these initiatives have to undergo a highly complex decisional mechanism for their ratification.

The ports of Genoa, La Spezia and Savona are currently developing railway projects (with the hinterland, and from there to Northern Italy and in general to Southern Europe) on the assumption that good railway connectivity will enable the Ligurian ports to expand their captive area outside national borders. For example, the market for the port of Genoa, the most important Italian port for direct calls services, consists almost exclusively of national origin/destination traffic (96%) and is concentrated in the central-northern Italian regions. The improvement of land accessibility is the focal point of a plan that foresees, in the short and medium term, important operations both infrastructural and organizational (Autorità Portuale di Genova, 2005). In the past few years the Italian Port Authorities have promoted several initiatives inside and outside port walls, the purpose being to encourage intermodality and the development of the new logistic value-added services increasingly necessary to compete on a global level. Today, in fact, the development of a modern port requires an efficient network of railway connections with inland logistic platforms and with the relative hinterland (Van Klink, 1995). In this situation, ports must be efficient, thereby contributing to the competitiveness of the entire logistic chain. For these reasons, the Ligurian ports, congested due to a lack of space, have had to create stable and effective railway connections with the hinterland. They have consequently constructed dry ports just a few tens of kilometers from their docks which will represent the basis on which to grow and eventually offer additional logistic services (Autorità Portuale di Genova, 2005). With a dry port development strategy, the maritime port enlarges its hinterland, becomes closer to its customers, helps resolve its problems of saturation, and improves its ability to compete, offering direct services to customers and attracting new cargoes (UNCTAD, 2004).

However, the construction of new transport networks serving the port may have substantial impacts on organization and on traffic flows only in the long run. Moreover, this period of time may be prolonged both by the physiological? deficiency of public financing and by the frequent opposition raised against the construction of new infrastructures, which slows down or even interrupts their realization. It is therefore necessary to find a rapid solution that allows faster and cheaper transport to and from ports. In this regard, however, financial issues may be resolved by upcoming financial autonomy,[3] but PAs are also supposed to catalyze further private investments, both by finding partners and by stimulating the demand to increase investment profitability (Sanchez, 2006).

Table 3 reports the formulation and implementation of strategies to foster intermodality in each Ligurian port.

---

[3] Italian law, in art.6 codicil 5 of law 84/94 and in codicil 6 of the same article replaced by art.8 bis of D.L. 30 December 1997, n.457, converted into law 27 February 1998, n.30, permits port Authorities to "costituire ovvero partecipare a società esercenti attività accessorie e strumentali rispetto ai compiti istituzionali affidati alle Autorità medesime, anche ai fini della promozione e dello sviluppo dell'intermodalità, della logistica e delle reti trasportistiche[3]". Moreover, for application of the quoted law, reference has been made to D.M. 4 April 1986, according to which the port railway service within port borders is part of the services of general interest to be supplied against payment to the port's users.

Table 3: Formulation and realization of strategies in favor of intermodality.

	Aim	*Strategy*	*Realisation*
Genoa Port Authority	Development of railway traffic to/from port	Discipline economical and operational relations about connecting port with national railway service	Signed a protocol agreement with Ferrovie dello Stato
	Expand docks and inland areas	Creation of an inland port and connections between this and the port	Looking for an area to place this site, with Local Agencies
La Spezia Port Authority	Improving connections between port and S.Stefano Magra dry port.	Construction of railway tracks between the two sites	Participate and rely upon an external society for the construction of new infrastructures
	Transform S.Stefano Magra in inland railway terminal	Improve dry port facilities	Lengthen tracks inside the site to allow the creation and composition of complete trains
Savona Port Authority	Integrate port with industrial areas in Liguria and Piemonte	Exploit existent railway lines from Savona to Turin and Alessandria	Manage, through a certificate subject, railway marshalling and traction on two pass lines, from port to S.Giuseppe di Cairo
	Make the railway service reliable and frequent	Purchase some traction vehicles to improve railway times	Purchase 6 marshalling vehicles and 4 electrical locomotives (E645)

The topic of inland logistic platforms, moreover, introduces another problem that has always plagued the Ligurian ports system. Port competitiveness nowadays is increasingly influenced by the availability of integrated logistic services which require broad spaces for the creation of dry ports that expand the territory of reference thanks to efficient connections and the supply of specific services. But Liguria has considerable difficulties in accommodating this type of infrastructure because of:

- a lack of suitable spaces and, consequently, their high cost;
- increasing demand for space by surrounding cities.

This relative scarcity and/or the high price of space may induce (port) industries to move to regions where these inputs are available on more convenient conditions (Musso et al. 2000).

In order to remedy these shortcomings, the Ligurian ports have defined some common goals, such as the development of a network of inland logistic platforms beyond the Apennines in order to free up spaces in ports (narrow, crowded and expensive) and which can be used as buffers for goods coming from ports. In the short run, this network could fulfil some of the requirements of ports expansion and the need to improve inland connections without increasing road transport. The choice of an inland logistic structure will be influenced by infrastructural equipment, transport and logistic services, customs and tax conditions. Especial attention must be paid to the gradient of the railway from the port to the dry port, which must not be too high, because a service requiring double traction – like for example the Savona–San Giuseppe di Cairo route (24 km long, with a maximum gradient of 30‰) – involves added costs and has repercussions on the length of convoys.

In this regard, the Italian PAs, and the Ligurian ones in particular, have promoted various initiatives, among which:

agreements with Trenitalia, RFI, local public agencies, Ministero delle Infrastrutture e dei Trasporti, private management railway societies, and logistics centers ("Protocolli d'Intesa");

- the creation of partnerships among railway companies and among intermodality and logistics promotion companies;
- the purchase of areas dedicated to logistic activities;
- the purchase of shunting or railway traction vehicles;

All these aspects can be considered as constituting effective coordination among several port stakeholders. To be effective, this coordination must not only be commercial but also include cooperation and common initiatives to develop new expertise and shared learning processes, and to make investments with cluster benefit (De Langen, 2004). The PA is consequently required to provide incentives for investments with positive effects on other firms in the cluster. In other words, financial autonomy, as well as the need for new and complex investments, are inducing the Ligurian PAs to behave like cluster managers.

5. Conclusions

The paper has argued that the Ligurian ports are facing strong demand pressure because of the increase in maritime transport flows in the Mediterranean Sea. Drawing on cluster theory, it has shown that the problem of under-capitalization due to positive externalities could be solved if the Ligurian Port Authorities acted as cluster managers: that is, if they coordinated and catalyzed investment.

We have shown that the main means by which such coordination can be achieved is the creation of public private partnerships. However, it should also be stressed that continuous dialogue with all stakeholders in and around the port is crucial. The geographical dispersion of economic effects, in fact, in the absence of increasing value actions in the territory, may be perceived negatively, because goods passing through ports often do not generate significant employment or added value for the local communities (Ferrari et al., 2007). This is the main reason why the Italian Ministries of Transport, Infrastructure and Finance are discussing how to devise a law that will allow the devolution of part of the general taxes (V.A.T. and customs duties) to Port Authorities so that they can finance the most important port infrastructure projects.

In the context of increasing financial autonomy, Port Authorities are now able to act as cluster managers, coordinating actors and stimulating cooperation for joint investment. According to Musso et al. (2004), the ports of Genoa, La Spezia and Savona generate about 2 billion euros of value added and have a global employment impact of about 60,000 jobs. In this context, cluster management should be considered as a strategic ingredient in enhancing economic development induced by port activity in Liguria through a necessary governance of inter-firms and inter-institutional relations.

Acknowledgements

The authors wish to express their gratitude to two anonymous referees for their very useful comments, which have substantially increased the quality of the paper. The usual disclaimer applies, however. Financial support from the Genoa, La Spezia and Savona Port Authorities is gratefully acknowledged.

References

Autorità Portuale di Genova, (2005), *Costruiamo insieme il porto di domani*, Autorità Portuale di Genova, Genova.

Baccelli, O. and Sparacino, G. and Ravasio, M. (2007), *Porti italiani. Strategie per l'autonomia finanziaria e l'intermodalità*, EGEA, Milan.

Beckers, F. (2006), "Vertical and horizontal integration", *European shippers' council* - Proceedings from the ITTMAPS Conference, Antwerp.

Brooks, M. (2004), "The governance structure of ports", *Review of network economics,* vol. 3 issue 2. pp.168-183.

Cazzaniga Francesetti, D. (2005), "Italian versus Northern Range port competitiveness: a transportation cost analysis in Chinese trade" *European Transport*, 30:37-53.

Cullinane, K. and Khanna. M, (1998), "Economies of scale in large continer ship" *Journal of Transport Economics and Policy*, 33(2):185-208.

De Langen, P. (2003), "The performance of Seaport Clusters", PhD Thesis, Erasmus Researh Institute of Management, Erasmus University of Rotterdam.

De Langen, P. and Chouly, A. (2004), "Hinterland Access Regimes in Seaports", *European Journal of Transport and Infrastructure Research,* 4, pp.361-380.

De Langen, P. and Visser, E. (2005) "Collective action regimes in seaport clusters: the case of the Lower Mississippi port cluster", Journal of Transport Geography 13(2005) pp. 173-186.

De Monie, G. (2006), "Vertical and horizontal integration in the port industry: towards terminal networks?" *Policy Research Corporation*, - Proceedings from the ITTMAPS Conference, Antwerp.

Goss, R. (1990), "Economic Policies and Seaports: 1. The Economic Functions of Seaports", *Maritime Policy and Management*, 17(3):207-219.

Haralambides, H. Verbeke, A. Musso, E. Benacchio, M. (2001), "Port Financing and Pricing in the European Union: Theory, Politics and Reality", *International Journal of Maritime Economics,* 3: 368-386.

Haezendonck, E. (2001) Essays on Strategy Analysis for Seaports, Leuven, Garant.

Jansson, J.O. and Shneerson, D. (1982) *Port Economics*, Cambridge: MIT press.

Jansson, J.O. and Shneerson, D. (1987) *Liner Shipping Economics,* Chapman & Hall.

Klink, H.A. van (1995) Towards the Borderless Mainport Rotterdam – an Analysis of Functional, Spatial and Administrative Dynamics in Port Systems, Amsterdam: Thesis publishers.

Lee, J-Y and J-P Rodrigue (2006) "Trade Reorientation and its Effects on Regional Port Systems: the Korea-China Link along the Yellow Sea Rim", Growth and Change, Vol.37, No.4, pp. 597-619.

Levison, M. (2006), "The Box". Princetown University press, Princetown, NJ.

Musso, E. Benacchio, M. Ferrari, C. (2000) Ports and Employement in Port Cities, *International Journal of Maritime Economics,* vol.2 (4), (283-311).

Musso, E., Ferrari, C., Benacchio, M., Bacci, E. (2004), *Porti, lavoro, economia. Le regioni portuali di fronte alla rivoluzione logistica*, Padova: CEDAM.

Myung-Shin, H. (2003) "A comparison of service quality at major container ports: implications for Korean ports" *Journal of Transport Geography*, 11:131-137.

Notteboom, T. (1997) Concentration and the Load Centre Development in the European Container Port System, *Journal of Transport Goegraphy,* 5:99-115.

Notteboom, T. Winkelmans, W, (2001) Structural Changes in Logistics: how will Port Authorities face the Challenge? *Maritime policy and management,* 28(1):71-89.

Penfold, A. (2006) Vertical and horizontal integration in liner shipping - no limits?, Proceedings from the ITTMAPS Conference, Antwerp.

Rodrigue, J-P (2003) "The Port Authority of New York and New Jersey: Global Changes, Regional Gains and Local Challenges in Port Development" Les Cahiers Scientifiques du Transport, No.44, pp. 55-75

Sanchez, R. (2006) "The role of the new port Authorities and the LA port situation", Proceedings from the ITTMAPS Conference, Antwerp.

Saundry, R. and Turnbull, T. (1997), "Private Profit, Public Loss: the Financial and Economic performance of U.K. ports", *Maritime Policy and Management*, 24(4):319-334.

Slack, B. (1989) Port Services, Ports, and the Urban Hierarchy, Tijdschrift voor Economische en Sociale Geografie, vol.

UNCTAD (2004), *Assessment of a seaport land interface: an analytical framework*, UNCTAD, New York.

Wiegmans, B.W., Ubbels, B., Rietveld, P., and P. Nijkamp (2002), Investments in container terminals: Public Private Partnerships, *International Journal for Maritime Economics*, 4(1):1-20.

European Transport \ Trasporti Europei n. 39 (2008): 59-81

Using conjoint analysis to investigate preferences of inhabitants for the future of a greyfield area: an application to the Old Port in Trieste

Jérôme Massiani [1*], Paolo Rosato [1, 2]

[1] *Università degli studi di Trieste, Dipartimento di Ingegneria Civile e Ambientale - Italy*
[2] *Fondazione Eni Enrico Mattei, Venezia - Italy*

Abstract

In developed countries, abandoned industrial (derelict or underused) areas often occupy important parts of the cities. This raises issues about the reuse of these areas as well as on the conservation of industrial heritage they often entail. In order to help decision maker in understanding the preferences of inhabitants for different reuse possibilities, different techniques have been used in the literature. Most of them were based on Contingent Valuation techniques, while the competing approach, Conjoint Analysis, has barely been used in this area of research. In this article, we present the results of a Conjoint Analysis experiment on the reuse of a large, partly abandoned, port area in Trieste (Italy) featuring buildings with intermediate historical and industrial heritage value. Three hundred computer-assisted interviews have been made on a representative sample of Trieste inhabitants, eliciting their preferences for different reuse hypotheses and building conservation scenarios. The collected data have been processed using Latent Class and Mixed Logit models to explore heterogeneity among interviewees' preferences. Our findings indicate a very clear preference in favour of tourism and leisure oriented uses. On the other hand, preferences in terms of conservation and the impact of cost are much more difficult to measure. This difficulty persists even when specified or non specified heterogeneity is taken into account, although Mixed Logit estimates provide more convincing results.

Keywords: Port, Reuse urban sites, Conjoint analysis.

---

1. Introduction

"Alt Wien war auch neue"

"Once, Old Vienna was also new"

In many developed countries, derelict areas occupy relevant parts of the cities. The existence of these areas raises issues regarding their future use. Moreover a number of these areas host buildings with some historical value, at least as testimonies of industrial history. In this context, policy makers and planners may need some instruments in order to know the preferences of inhabitants regarding the future of these areas. A common instrument to investigate preferences for new situations, which has been developed in the area in psychometrics and is commonly used in economics, is Conjoint Analysis. This approach has generated a number of applications in areas ranging from transport economics to the valuation of environmental externalities or the demand for cultural goods. An ongoing stream of research is making use of these techniques, together with other techniques known as Contingent Valuation, to "assign a value" to the conservation of heritage (Pierce and al. 2002) and has resulted in applications to objects such as: Lincoln cathedral (Pollicino e Maddison, 2001), Changdeok Palace in Seoul (Kim e al, 2007), Northern Hotel in Fort Colins-Colorado (Kling et al, 2004) or the conservation of built heritage in Newcastle neighbourhood of Grainger town (Garrod e al, 1996). Strictly speaking, we are not aware of the applications of Conjoint Analysis technique to the future use of an urban area with consideration to the conservation of existing buildings[1].

---

* Corresponding author: jmassiani@units.it

The present article aims at filling this gap. The case study is the Old Port of Trieste (North-East Italy) a 700.000 square meters (173 acres) area that is partly unused but for a small number of port activities. This area hosts warehouses and industrial buildings constructed at the end of XIXth century that have some heritage value and are currently protected under Italian preservation regulation.

In this context, this paper aims at investigating the preferences of Trieste's inhabitants for the future of the Old Port regarding uses and conservation. The method used is based on Choice Based Conjoint Analysis.

Our research differs from previous researches reported in the literature (for an overview, see Pierce et al, 2002):

1. We explicitly concentrate on functions and functions mixes, while most of the available results consider merely conservation. This also allows use to investigate the possible complementarities and/or incompatibilities between different functions.
2. We deal with a heritage that has an "intermediate" value, while most of the previous researches (Pearce et al., 2002, pp. 262-264) concentrate on constructions with outstanding value.
3. We explicitly deal with different levels of preservation, giving the possibility to the interviewees to express preferences for the conservation of 0, 25 and 50% of the buildings. This makes it possible to detect non lineraties in the value assigned to the heritage.
4. We make use of single scale valuation questions regarding future uses and conservation, together with Conjoint Analysis questions, in order to be able to compare the outcomes of both types of surveys.
5. We investigate with special care the impact of the time scale for the payment (single year tax or decennial tax). Attention on the "periodicity of the elicited WTP" was listed by Pearce et al (2002, p. 265) as one of the major topics of future research for the valuation of heritage.

The article is structured in five sections. Following this introduction (section 1), section 2 presents the context of Trieste Old Port, section 3 presents the data collection and descriptive results about the sample, section 4 provides the results of the Conjoint Choice experiment, section 5 draws the conclusion of the research and indicates the possibilities for future developments.

---

[1] Among previously cited papers only very few use Conjoint Analysis while a large majority uses Contingent Valuation. Among the researches using Conjoint Analysis, the study by Morey and Rossmann (2003) is probably the closest to our topic. Those authors use Conjoint Analysis to investigate the preferences for the conservation of a set of white marble monuments in Washington. However, their study cannot be strictly compared to ours as they investigate a heritage that is spread in the city.

2. Trieste Old Port

In this section, we provide a brief overview on the history of Trieste Old Port and subsequently investigate the possible future of the area.

2.1. From New Port to Old Port

The Old Port of Trieste was built during years 1867-1883, when the city of Trieste was under the Austrian authority, based on the project of the French engineers Paulin Talabot and Hilarion Pascal. However, it is only after 1887 that the warehouses and technical/servicing buildings were built to substitute shelters and give the port a more definite form. In the 1920's, when the port had found its final configuration, it held about 37 warehouses and 20 service buildings, some of them of relevant architectural interest as the hydrodynamic station (a facility which uses water pressure to move goods), warehouse number 26 and the custom belt buildings surrounding the port. Due to the fast growing traffic of the beginning of the 20th century, and due to the intrinsic limitation of the Old Port (in particular the limited water depth) a decision was taken to expand the port facilities of Trieste through the construction of a New Port in the easternmost part of the city (distant 4 km from Old Port). The work started in 1901. Twenty years after its completion, what was until then the "new port" becomes the "Old Port", as it is still now.

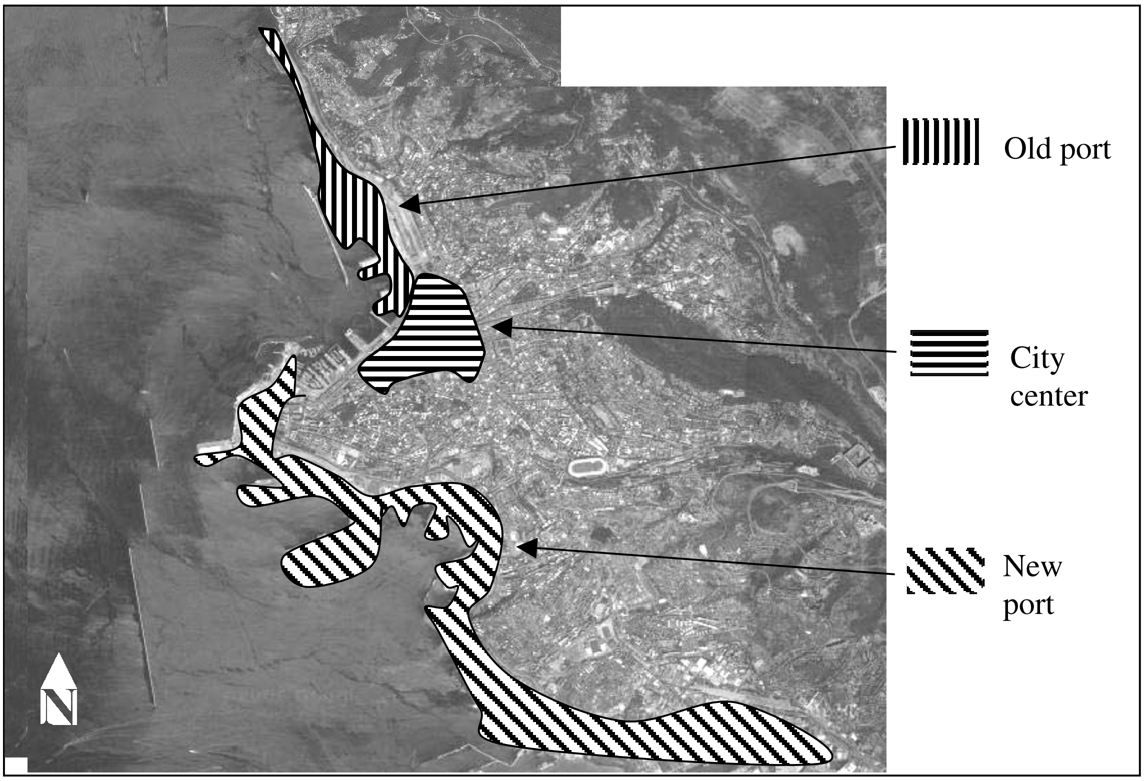


Figure 1: Trieste Old Port, city central area and New Port.

In the subsequent years, the Old Port had a declining activity and was the object of numerous urban projects. Table 1 provides an overview of the main projects developed for the area, including an unsuccessful candidature of Trieste for the International Exhibition of 2008. None of these will be, even partially, undertaken. The port area is nowadays partly unused, hosting a few specialized freight activities (like a terminal for the export of living cattle, some stocking in the warehouses, and some administrative functions related to the maritime activity like the Port Authority).

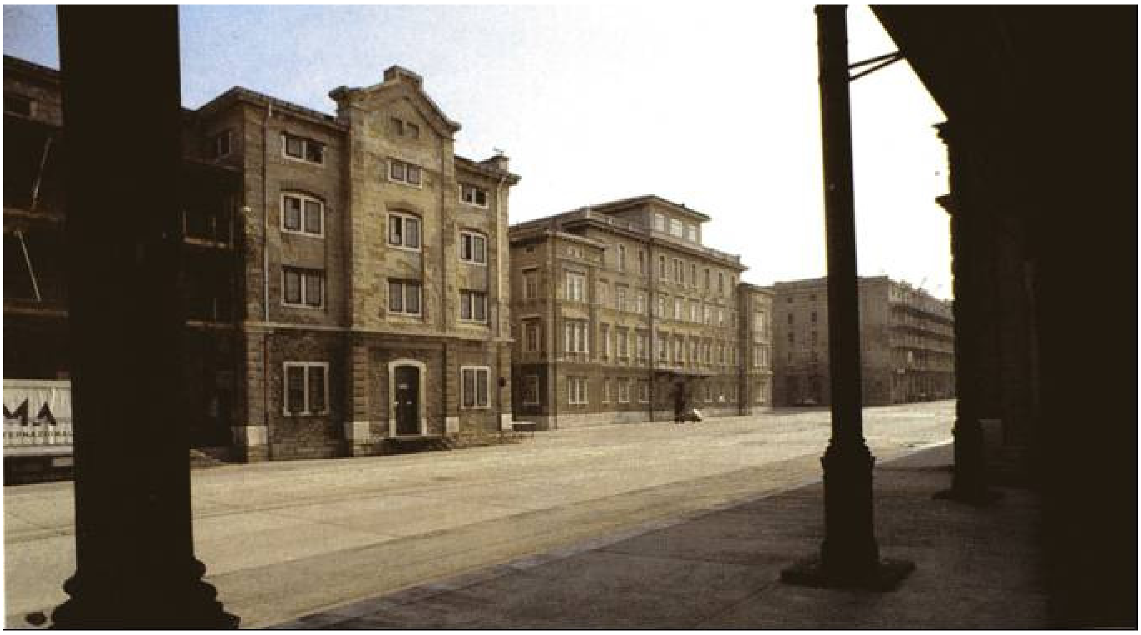


Figure 2: Snapshot of buildings of Trieste Old Port.

Table 1: 35 years of unrealized projects in the Old Port, an overview.

35 years of unrealized projects in the Old Port, an overview	
1974	Guido Canella's project based on Park, Exhibition centre, parking
1988 - 91	Project Polis: urban neighbourhood with offices Project Bonifica: Two marinas and offices with a tunnel connecting with the New Port
1990	Synthesis between Polis and Bonifica projects Special planning scheme focused on traffic issues
1995	Project Tergeste Pier III : Marinas, shops and parks
1997	Association Trieste Futura: Masterplan for the restoration of Old Port (arch. Sola Morales)
2000	Port Authority project for the update of Old Port masterplan (arch S. Boeri), the project is blocked by the veto of the ministry of cultural goods
2006	A new masterplan (Systematica e Norman Foster and partners) is proposed. It is compatible with the listing of different buildings and mixes a large variety of functions

2.2. Prospects for the future of Old port

The current situation of the area appears to many observers as unsatisfactory because the port area has major assets. First, it is very close to the heart of the city (less than one km from the virtual centre of the city and adjacent to Trieste central railway station). Second, it is a very large area (700.000 m²). This is a valuable resource because, although Trieste economy is relatively stagnating, the city is one whose building space is scarce due to its geographical situation (the city is built on a tiny land strand, between a plateau and the seashore).

The legal situation of the port is also peculiar: it is a free custom area in virtue of a post war agreement, known as the London memorandum, a situation latter recognised by European Union Treatise. This may explain the difficulties that emerged in the realisation of past projects. Recently, the regulatory framework of the Old Port has undergone important changes through deliberations of the Port Authority and the local administrations, who issued new building and land use regulation for the area. This change will authorize a number of non-strictly maritime activities in the area (in a first stage: education, shops and offices).

In this new context a number of questions arise. These questions relate to the function mix that the area will host. Functions that such an area can host are numerous, to name a few: industry, shops, education, public services (hospital, schools, etc), offices, marinas, hotels and restaurant etc; not to mention the expansion of port activity that is advocated by part of the business community. Given the size of the area, it would be unreasonable to concentrate on one single use for the Old Port and it is more sensible to think in terms of function mix, referring at least to one main use and one complementary use.

Eventually, the future of the area raises issues about the conservation of existing buildings. These buildings may be of intermediate, rather than outstanding, heritage value, especially in a city that can count on a very rich built heritage, it is however a legacy of the past port history of the city. This heritage is submitted to legal protection: a majority of the buildings is listed and thus protected by restrictive regulations (Marin, 2003).

In this context, we propose to use a Conjoint Analysis questionnaire, in order to understand what are the preferences of Trieste inhabitants for the future reuse of the port. The next section presents more in details the questionnaire and data collection.

3. Questionnaire and data collection

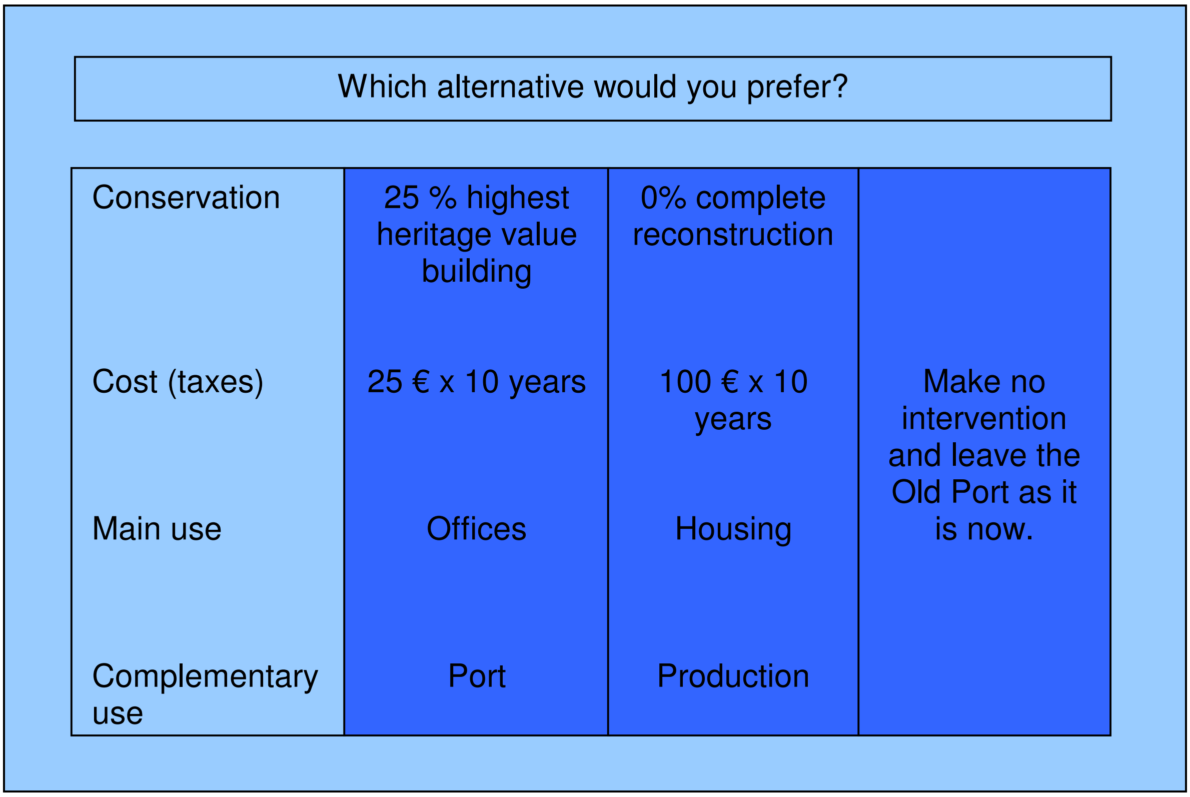
In this section we present the questionnaire. We also provide information on the data collection process. Eventually we present descriptive data of the interviewed population.

3.1. The questionnaire

A full list of the interview questions is provided in appendix. The questionnaire consists of three parts. The first part is introductory: it contains questions that allow to check whether the interviewee meets the target population (people living in the Trieste province), how much they know about the Old Port (did they already go there? are they capable of precisely indicating its location in the city, etc…), closed question (would they prefer the Old Port to become a pedestrian area?) as well as ratings of possible future uses of the port.

A second section consists in the Conjoint Analysis experiment itself. Each interviewee had to answer to eight conjoint choice questions. These questions are as illustrated on Figure 3. Two "project" alternatives are presented, together with one "status quo" alternative defined as "*make no intervention and leave the Old Port as it is*". The project alternatives are defined by four attributes: two attributes describing the reuse of the port (main use and complementary use), one describing conservation versus reconstruction, and one reflecting the cost of the program. More in details, the attributes were:

- Conservation and restoration of existing buildings: 0% (full reconstruction), 25% (only buildings with high heritage value), 50% (same as previous + buildings of intermediate heritage value). Note that this attribute implies conservation and restoration together. None of the projects presented in the interview, except the status quo alternative, intends to conserve buildings in their condition at the time of the interview.
- Cost for taxpayers (0, 25, 50, 100, 150 €). This attribute expresses the cost of a future scenario for the reuse of Old Port. It is based on the assumption that the cost would incur through a special scope local tax. This extra cost is expressed in two different ways: single payment or the annual amount of a decennial tax. Half of the sample answered the questionnaire with the 10 years payment and half of the sample answered the questionnaire with the single payment.
- Main use, as well of complementary use could be one of the followings: Port, Production, Shops, Offices, Housing, Hotels and restaurants, Marinas, Parking, Public services (school, civic centre).



Which alternative would you prefer?

Conservation	25 % highest heritage value building	0% complete reconstruction	Make no intervention and leave the Old Port as it is now.
Cost (taxes)	25 € x 10 years	100 € x 10 years	
Main use	Offices	Housing	
Complementary use	Port	Production	

Figure 3: Conjoint choice interview screenshot (translation to English, questionnaire with 10 years payment).

Figure 3 illustrates the screen that was presented to the interviewees during the conjoint choice section of the questionnaire.

A third section contains a set of supplementary descriptive questions regarding the socio economic characteristics of the interviewee (personal net income, age, education, etc).

3.2. Data collection

The data collection took place from 20 may to 28 July 2007. The target population was defined as the inhabitants of Trieste Province[2]. The survey method was based on quota sampling. Four characteristics have been selected to define the quota: age, sex, area of habitation and level of education. The targets of the quotas are presented in Table 2. These targets were respected in the data collection with a deviation smaller than 1%.

Table 2: Questionnaire target quotas (%, reproduced ± 1% in the collected data).

Population categories and corresponding shares	
Age:	
18-24	6,1
24-34	15,9
35-44	16,6
45-54	15,6
55-64	16,8
65-74	14,2
>74	14,8
Gender:	
Male	46,2
Female	53,8
Location:	
Neighbourhoods close to the port	29,9
Other neighbourhoods of Trieste municipality	57,3
Other municipalities in the Province	12,8
Educational level:	
University degree	6,7
Secondary school	30,8
Primary school (final)	30,3
Primary school (intermediate)	27,4
No diploma	4,6

3.3. Results

The descriptive data collected in the survey indicate, first, a good level of familiarity of interviewees with the port. It turned out that 94% of the interviewees knew the location of the Old Port, although 25% knew its location but could not give a clear description of its extension[3]. 58% of the interviewees already entered the area of the port, mainly for professional or entertainment purposes[4], 42% (out of 58%) entered the area at several occasions. Interestingly, we asked people what they thought was the current use of the Old Port, and it turned out that 82% of the interviewees declared it was not used, 7% said it was used for port activities, and 10% for parking. While the latest answer derives from confusion (there is a large parking building at the hedge of the area, but not within the area), the two other answers should be considered as consistent with the current situation of the area.

---

[2] Unlike other Provinces in Italy, Trieste Province is chiefly consisting (87% of the population) in the capital town Trieste, while the 13 % of the Province's inhabitants live in the 5 other municipalities of the Province. Trieste is the smallest Province of Italy. It extends on a tiny seashore strand 25 km long and 3-5 kilometres wide. For the purpose of our study it was found more reasonable to investigate preferences of all the province inhabitants, rather than artificially restricting to the municipality of Trieste.

The second information provided by the interview indicates a concern that, the future of the area should not only be dictated by functionality but also by urban quality. First, interviewees advocate a balance between the construction of new roads *to access* the area and the need to preserve the interior of the area from too much road and traffic: while 55% of the interviewees declare "very important" or "rather important" the "creation of roads to connect the area with the main road network", 88% of them declare that they would prefer an area mainly pedestrian rather than the "construction of roads within the old port area". Interviewees exhibit also a preference for the conservation of existing buildings: keeping "buildings with high or intermediate heritage value, half of the existing buildings" would be favoured by 46% of the sample; an alternative, more modest protection (preserving "only buildings with high heritage value, 25% of existing buildings") would be supported by 45% of the population. This means that 91% of the sample is in favour of the preservation of 25% or more of the buildings and, conversely, only 9% of the population is in favour of a complete reconstruction of the area.

Eventually we asked people to rate the different future possible uses of the area. As illustrated on Table 3, the main features emerging from these data is that there are clear preferences for uses linked with leisure and tourism (Marina is ranking first, Hotels and restaurant is ranking second) and services for the public (ranking third). On the contrary, there is a dislike of industrial and port activities (both ranking as the two least preferred activities).

Table 3: Rating of possible future uses of the Old Port area.

	Port	*Production*	*Shops*	*Parking*	*Housing*	*Offices*	*Services for the public*	*Hotels and restaurant*	*Marina*
Mean	3.8	3.7	4.1	4.4	5.2	5.4	5.8	6.2	7.5
Median	3.0	4.0	4.0	5.0	5.0	6.0	6.0	7.0	8.0
Variance	9.2	5.8	5.8	4.8	6.2	6.7	7.3	6.7	3.5

Note: question was phrased as "important for the future of Old Port", 1 means not important, 10 means very important.

These results give indication on the preferences of Trieste inhabitants for the future of the port area. However, one limitation of such results is that they give no indication on the trade-offs between competing objectives, and in particular they give no monetary measure to the benefits of the various possible operations in the area. To overcome these limitations we make use of the conjoint choice data whose results are presented hereafter.

---

[3] This situation typically occurs considering the fact that the Old Port is adjacent to the city central area, but that the remaining part of the Old Port is less visible, as it is inaccessible lying between the rail tracks and the sea shore. Thus, a number of Trieste inhabitants know where the Old Port is, but have no clear idea of the extension of the area.

[4] The area is occasionally hosting recreational and cultural events.

4. Conjoint choice experiment results

The conjoint choice data have been analysed using different models. We first present the results of a basic multinomial Logit. The logit model express P(i), the probability of choice of each alternative i, as a function of the stochastic utility V_i of each alternative.

If we suppose that the utility associated with each alternative *i* consists of a deterministic and a stochastic component such that:

$$U_i = V_i + \varepsilon_i \,. \tag{1}$$

If we also suppose that ε_i has a Weibull (or Extreme Value type I) distribution, independent and identical among alternatives and among interviewees, the probability of choosing alternative *i* can be expressed by the logit formula:

$$P(i) = \frac{e^{V_i}}{\sum_{j=1}^{3} e^{V_j}} \tag{2}$$

where P(i) is the probability of choosing alternative i, and V_i is the deterministic component of the indirect utility of alternative i. We suppose that the deterministic part of the utility can be expressed as :

$$V_i = \beta X_i \tag{3}$$

where β is a vector of coefficients, and X_i is a vector of attributes.

In our application, X_i consists of the following attributes:

- Annual tax: amount of annual taxation (= 0 for the interviews with 10 years taxation);
- Total 10 years tax = 10 × annual tax (= 0 for interviews with single year taxation);
- RestCons25: a spline variable that takes the value 0 if the alternative has no conservation, and the value 25 if the scenario implies restoration and conservation of the most valuable 25% among existing buildings;
- RestCons50: 0 if the alternative has no conservation, 50 if the alternative implies restoration and conservation of 50% of the buildings. Note that when using such a codification for RestCons25 and RestCons50, the corresponding coefficients can be directly compared as they express the utility of one percent of restoration;
- 8 variables that code the Main Use of the area. Namely: port, production, shops, offices, housing, hotels and restaurant, marinas, parking, public services (hospital, schools, etc). These variables are coded using effect coding[5] rather than the more usual dummy codification;

---

[5] Effect coding has the advantage of making the coefficients of theses attributes independent of the value chosen as the "base variable". Moreover, it offers the advantage of making it possible to compute the attribute's coefficient of this baseline, as minus the sum of the other coefficients. See Hensher et alii (2005) for more details.

- 8 variables that represent the complementary use (same list as main use, included with effect coding);
- Status quo: a dummy variable that is 1 for the alternative described as "make no intervention and leave the Old Port in its current situation" and 0 for other alternatives.

Table 4: Model estimates for MNL (both questionnaires and single questionnaire).

Model number			*Model 1*		*Model 2*		*Model 3*	
Model type			MNL		MNL		MNL	
Sample			Half sample				Full sample	
			One year tax		10 years tax		One year +10 years	
n obs (choices)			1200		1200		2400	
rho^2			0.232		0.172		0.196	
LogLikelihood			-1091		-1013		-2120	
			β	Signif.	β	Signif.	β	Signif.
Total cost (euro)		(1 year)	-0.00039		-	-	-0.00049	
		(10 years)	-	-	-0.00014		-0.00011	
Restoration-		R-Cons25%	-0.0011		-0.0041		-0.0021	
Conservation		R-Cons50%	-0.0019		0.0007		-0.0005	
uses		Port	-0.64	-	-0.98	-	-0.80	-
		Production	-0.77	***	-1.22	***	-0.97	***
	m	Shops	-0.28	**	-0.46	**	-0.35	***
	a	Offices	0.28	**	0.49	**	0.37	***
	i	Housing	-0.11		0.01		-0.04	
	n	Hotels and rest	0.43	***	1.14	***	0.76	***
		Marinas	1.71	***	1.93	***	1.79	***
		Parking	-1.26	***	-1.57	***	-1.41	***
		Services	0.64	***	0.66	***	0.65	***
	c	Port	-0.66	-	-0.97	-	-0.79	-
	o	Production	-0.55	***	-0.42	***	-0.49	***
	m	Shops	-0.06		-0.07		-0.06	
	p	Offices	0.23	*	0 .27	*	0.24	**
	l	Housing	-0.23	*	0.00	*	-0.10	
	e	Hotels and rest	-0.06		0.10		0.01	
	m	Marinas	0.90	***	0.81	***	0.84	***
	e	Parking	0.09		-0.13		-0.01	
	n	Services	0.33	***	0.41	***	0.36	***
		Status quo	-0.55	***	-0.56	***	-0.54	***

Note: Significance: *** at 1% probability, ** at 5%, * at 10%, "-" = Non available.

Table 4 presents the results of a simple MNL model. Model 1 is calibrated on the 150 questionnaires with one year payment; Model 2 is calibrated on the 150 questionnaires with 10 years payment. Model 3 is calibrated on all 300 interviews.

The general pattern exhibited by models 1 to 3 is striking. They indicate very clear preferences in favour of leisure- or tourism-oriented uses and a strong opposition to productive uses (industrial and port) as well as parking. This is conform to answers given through Likert scales in the first part of the questionnaire. Complementary uses exhibit the same kind of preferences except that "Hotels and restaurants" and "Parking" are not significant. Results also indicate that the present situation of the port is disliked by the interviewees. Recall that these estimates have been made using the Effect Coding of the uses' attribute, instead of the more usual dummy coding. For this reason, each coefficient of the variables that are included in this form can be interpreted independently of the choice made for the (omitted) base variable.

Another relevant result is that neither cost nor the share of conserved and restored buildings are significant in the estimates. As far as cost is concerned, this is hardly consistent with economic theory. As far as conservation is concerned, this is not consistent with answers given by interviewees to previous answers of the questionnaire. This motivated a more in-depth examination of the data based on the idea that the reasons behind these results had to be found in heterogeneity of preferences among the interviewees. This hypothesis relies on a set of evidences collected in the literature on heritage preservation and cultural goods. For instance, Garrod and Willis' valuation of maximum Willingness to Pay for visiting the Durham cathedral indicates that individual willingness to pay of the interviewees varies a lot (1999, p. 46). A number of researches also found that individuals could be grouped into clusters based on the structure of their preferences. A way to identify these clusters is to make use of Latent Class where the segmentation of the population in different clusters is made together with the model estimation. Applications of Latent Class to heritage goods include the visits to Dutch museums (Boter et alii, 2004), the preservation of marble monuments (Morey and Rossmann, 2003), choice of recreational parks (Boxall and Adamowicz, 2002), the visits made to urban parks (Kemperman and Timmermans, 2006; Kemperman et alii, 2005). These latest authors found that the decomposition of the demand into four groups noticeably improves the quality of the model. Other methods to deal with heterogeneity rely on Mixed Logit which relaxes the hypothesis of fixed coefficients among the population in favour of a continuous distribution.

In the next paragraphs we propose to implement various instruments to explore the heterogeneity among interviewees in order to check for the existence of preferences for conservations and aversion to costs.

4.1. A priori segmentation based on interviewees' characteristics

A preliminary approach is to make use of a priori segmentation. Different segmented models have been estimated based on characteristics of the interviewees (sex, age, education, location, professional status, …).

Table 5: Segments with cost or conservation coefficient significant (10%).

Attribute	*Value*	*Segment*	*β*	*P critic*	*Number of obs.*	*Number of interviewees*
Conservation and restoration	50%	No diploma	-0.0188	0.07	112	14
		18-24 years	0.0117	0.07	144	18
		Student	0.0146	0.04	112	14
Cost	10 years	Female	-0.0003	0.01	1280	160
		Leave close to the port	-0.0003	0.02	728	91
		Secondary school diploma	-0.0003	0.03	752	94
		Age = 55 - 64 years	-0.0004	0.06	416	52
	1 year	Retired	-0.0029	0.09	664	83

Note: estimations have been made based on specification of model 3, pooling observations of one year tax and ten years taxes interviews.

Table 5 indicates that only a few among the segments of the population have a significant coefficient (at the 10% confidence level) for the conservation or cost attributes. Conservation at 25% is never found to be significant, while conservation at the 50% level is found to be significantly praised mainly among young interviewees (18-24 years old and students) and is significantly disliked among interviewees with low educational level.

One year tax is found significant (with the correct negative sign) only for retired people, while 10 years tax has a significant and negative coefficient for female, people living in the area close to the port, people whose educational level is secondary school diploma and people whose age is between 55 and 64 years.

These results indicate that a priori segmentation may not suffice to represent heterogeneity among the interviewees. This motivated to investigate whether Latent Class model would not be superior in that it relaxes the hypothesis of deterministic clustering that is underlying in a priori segmentation.

4.2. Latent Class estimate

The Latent Class model expresses the probability of choosing alternative *i*, as the product of two probabilities: the probability of belonging to class *c* and the probability of choosing alternative *i* if individual belongs to class *c*. Formally:

$$P(i)=\sum_{c=1}^{C}P(i\mid c).P(c)=\sum_{c=1}^{C}\frac{\exp(\delta_c z\ )}{\sum_{c=1}^{C}\exp(\delta_c z\ )}\cdot\frac{\exp(\beta_c X_i)}{\sum_{j=1}^{J}\exp(\beta_c X_j)} \qquad (4)$$

where δ_c are the class membership model coefficients, z are the characteristics of the individuals that are relevant for the classification among classes, β_c are the class specific coefficients and X_j are the attributes of alternative *j*. The Latent Class approach is based on a discrete distribution of the coefficients' vector.

Different Latent Class models have been estimated based on our data. The choice has been to estimate separated models for the each version of the questionnaire. This choice is based on the conjecture that the existence of two different versions of the questionnaire in one single Latent Class model could bring to serious flaws in the clustering of the population because the version of the questionnaire would already structure the data set.

Table 6: Latent Class estimates (2 classes, one year tax).

Model number			*Model 4*			
Model type			Latent Class			
Sample			One year tax			
n obs (choices)			1200			
rho^2			0.23			
LogLikelihood			-1011.7			
			Class 1		Class 2	
			β	Signif.	β	Signif.
Total cost (euro)		(1 year)	-0.0068		-0.0009	-
		(10 years)	-	-	-	-
Restoration-Conservation		R-Cons25%	-0.0070		-0.0042	
		R-Cons50%	-0.0048		0.0040	
Uses	main	Port	1.13	-	-1.16	-
		Production	1.06	***	-1.43	***
		Shops	1.69	***	-0.76	***
		Offices	0.92	***	0.27	***
		Housing	-1.84	***	0.22	**
		Hotels and rest	-1.81	***	0.92	***
		Marinas	1.90	***	2.04	***
		Parking	-2.17	***	-1.17	***
		Services	-0.88	***	1.07	***
	complement	Port	0.83	-	-1.13	-
		Production	0.31		-0.85	***
		Shops	0.07		-0.15	
		Offices	0.40		0.30	***
		Housing	-1.20	***	0.01	
		Hotels and rest	-1.18	***	0.28	**
		Marinas	1.35	***	0.90	***
		Parking	-0.69	**	0.10	
		Services	0.10		0.53	***
		Status quo	-1.18	***	-0.37	***

Note: Significance: *** at 1% probability, ** at 5%, * at 10%, "-" = Non available.

The general conclusion that emerges from the estimation is that only a few among the estimates were feasible (due to convergence issues) and it was noticeably difficult to obtain estimates for more than two classes. Table 6 presents the results of a Latent Class model (2 classes) estimated on the questionnaire with one year tax. This models include a set of class membership coefficients (personal income; zone of habitation – whether close to or far from the port, coded as an ordered variable; education; age). This model exhibit a significant coefficient for cost in the first class and for conservation (50%) in the second class. Interestingly, a larger number of coefficients for the use attributes are significant in both classes, compared with the specification without segmentation (model 3), like for instance the coefficient for housing. However, the validity of these results is limited considering that class membership model (not reported here) has no significant coefficient.

This observation may indicate that Latent Class is not the appropriate tool to represent heterogeneity in our observations. This may be due to the assumption about discontinuities of coefficient values that is inherent to the Latent Class approach. This motivated to estimate Mixed Logit models where the distribution of individual coefficients is assumed to be continuous.

4.3. Mixed Logit

Mixed Logit model relaxes the hypothesis of discrete distribution that is inherent to the Latent Class estimation in favour of a continuous distribution of each coefficient. The coefficients β_n, where n refers to the individual, are assumed to be distributed, independently of ε and *X*, with a distribution $f(\beta / \theta)$ where θ are the parameters of the distribution in the population, e.g. the mean and covariance. Such a specification is useful to capture variation in preferences among interviewees. Several distributions can be assumed, typically: normal, lognormal, triangular, uniform, etc. Instead, the error term ε_i is assumed to be independently and identically distributed (iid) Weibull (or Extreme Value type I).

If the researcher could observe β_n, then the choice probability would be a standard logit. That is the probability of choosing alternative *i* for individual *n*, conditional on β_n would be:

$$L_{ni}(\beta_n) = \frac{\exp(\beta_n^{'} X_{ni})}{\sum_{j=1}^{J} \exp(\beta_n^{'} X_{nj})} \tag{5}$$

However, the researcher does not know β_n. The unconditional choice probability is therefore the integral of $L_{ni}(\beta_n)$ over all possible variables of β_n

$$P_{ni} = \int L_{ni}(\beta_n) f(\beta \mid \theta) d\beta \, . \tag{6}$$

A Mixed Logit probability is the integral of standard logit probabilities over a density of parameters, or, in other terms, a weighted average of the logit formula evaluated at different values of β, with the weights given by the density function $f(\beta / \theta)$.

Tables 7 presents the estimates of a Mixed Logit model. This model assumes a triangular distribution for the cost coefficients. This is conform to the a priori expectation that cost coefficient is bound to be always negative. The conservation coefficients were assumed to be normally distributed, a solution that is usually invoked when there are no contrary evidence.

The results presented on Table 7.b indicate a slight increase in the fitting of the model[6]. One conservation coefficient (25%) is significant at the 10% confidence level. The sign of the coefficient associated with 25% conservation is negative, which indicates an aversion to conservation. The standard deviation of the normal distribution of both conservation coefficients, presented on table 7.a, is significant, which indicates the existence of a relevant dispersion in the "tastes" of the population regarding conservation. Based on the mean and the estimated standard deviation of the coefficient for conservation, one can estimate that 55% (cons 25) and 54% (cons50) of the distribution of the conservation coefficients is negative.

Tables 7: Mixed Logit estimation.

Tables 7.a: Standard deviation of β.

Attribute	*Distribution*	*Standard deviation of β distribution*	*Significance*
(1 year)	Triangular	0.00096	
(10 years)	Triangular	0.00026	
R-Cons25%	Normal	0.0540	***
R-Cons50%	Normal	0.0276	***

---

[6] The adjusted rho square is 0.195, to be compared with 0.192 for a comparable MNL Model both estimated without panel data structure.

Tables 7.b: Coefficient estimate.

Model number			*Model 5*	
Model type			Mixed Logit	
Sample			Full sample One year +10 years	
n obs (choices)			2400	
rho^2			0.1951	
LogLikelihood			-2111.96	
			β	Signif.
Total cost (euro)		(1 year)	-0.00048	
		(10 years)	-0.00012	
Restoration-Conservation		R-Cons25%	-0.0067	*
		R-Cons50%	-0.0026	
Uses	main	Port	-1.02	-
		Production	-1.19	***
		Shops	-0.48	***
		Offices	0.45	***
		Housing	-0.06	
		Hotels and rest	0.95	***
		Marinas	2.29	***
		Parking	-1.75	***
		Services	0.82	***
	complement	Port	-0.96	-
		Production	-0.64	***
		Shops	-0.10	
		Offices	0.28	**
		Housing	-0.13	
		Hotels and rest	0.06	
		Marinas	1.07	***
		Parking	0.02	
		Services	0.44	***
		Status quo	-0.59	***

Note 1: Significance: *** at 1% probability, ** at 5%, * at 10%, "-" = Non available.

Note 2: Due to algorithm conversion reasons, the model estimation does not take into account the repeated observations nature of the data (panel).

4.4. Model with use interactions

Eventually, we tested the existence of interactions among the different uses. The reason for these other estimates is both to investigate potential complementarities among uses and to check whether the existence of these complementarities may be an alternative potential reason for some limitations of the MNL models. In other words, other than heterogeneity, does the existence of interactions between the uses explain why cost and conservation coefficients are not significant in the various models that were estimated? Table 9 provides the estimates of uses' interactions coefficients where each use interaction variable is defined as the product of two dummy variables (for instance the attribute representing the mix Port (main) + Shops (complementary) takes the value one when these two uses are proposed in the considered alternative and the value zero for other uses). Each column corresponds to a main use, each line to a secondary use. The mix Shops + Production is chosen as an (arbitrary) baseline for the estimation.

Table 8: Coefficient of the cost and conservation coefficients (model with uses' interaction).

	β	*Critical probability*
1 year tax	-0.00034	0.64
10 years tax	-0.00012	0.09
R-Cons25%	-0.00139	0.62
R-Cons50%	-0.00025	0.85

Table 9: Coefficient of the use mixes (model with uses' interaction).

Main use Compl.	*Port.*		*Prod.*		*Shops*		*Offices*		*Housing*	
Port.	-	-	0.00		-	-	0.81	*	0.29	
Prod.	0.72		-	-	0.96	**	0.71		0.83	*
Shops	0.85	*	0.55		-	-	1.46	***	0.73	
Offices	0.84	*	0.25		1.03	**	-	-	1.65	***
Housing	0.38		-0.03		0.61		1.94	***	-	-
Hotels and rest	-0.04		-0.19		1.36	***	1.73	***	1.26	***
Marinas	0.93	**	1.44	***	1.94	***	2.63	***	2.26	***
Parking	0.47		0.63		0.92	**	1.66	***	1.15	**
Services	0.92	*	0.01		0.91	*	2.31	***	1.45	***

Main use Compl.	*Hotels and rest*		*Marinas*		*Parking*		*Public Services*	
Port.	1.17	**	2.12	***	-1.09		0.92	**
Prod.	1.24	***	2.40	***	-0.84		1.43	***
Shops	1.73	***	3.16	***	-0.44		1.67	***
Offices	1.96	***	3.60	***	0.07		2.22	***
Housing	2.20	***	2.97	***	0.12		1.71	***
Hotels and rest	-	-	2.89	***	0.27		1.87	***
Marinas	2.81	***	-	-	0.93	**	2.49	***
Parking	1.96	***	3.09	***	-	-	2.69	***
Services	2.90	***	3.58	***	0.14		-	-

Note 1: Significance: * at 10%, ** at 5%, *** at 1%.

Note 2: The models are estimated based on a dummy codification for the uses' mix. For instance, the configuration where main use is Productive and secondary use is Port is coded by an attribute that takes value 1 when the proposed alternative has theses uses, and 0 in the other situations. We recall that the mix (main use = shops and complementary use = port) is taken as the (arbitrary) baseline.

The conclusions emerging from Table 8 and Table 9 are twofold. First, they indicate that, when interactions between uses are taken into account, the only coefficient for cost and conservation that is significant is the coefficient for the 10 years taxes, this is slightly more satisfactory than in the base model (model 3), but does not solve all the problems linked with the lack of significance of these coefficients. Second, regarding the interactions between the uses, the main pattern emerging from Table 9 is that the main uses that are significant in the other model estimates are still significant when combined with another use. Marinas still exhibit the highest coefficients, whatever complimentary use is proposed. Hotels and restaurant also rank high. This happens even in circumstances where the complementary use is disliked like, for instance, when Port and Production are proposed as complement to Marinas or Hotels and restaurant. The most appreciated uses' mix is Marinas + Offices, the most disliked mix (with at least 10% significance) is Office + Port. One can also note that some uses are significant only in certain combinations; this is for example for the main use as parking that is significant (at the 10% probability) only with marinas as a complementary use.

5. Conclusions

In this article we have used choice-based Conjoint Analysis to explore the preferences of Trieste inhabitants for the future of the Old Port area. Thanks to a first set of questions, we found that Trieste inhabitants have a knowledge of the Old Port that seems sufficient to consider their preferences as meaningful. Second, when asked about the future of the port, interviewees declare to be in favour of the conservation of existing buildings. They are also in favour of a predominantly pedestrian area, indicating a preference for a "soft" development scheme. They also exhibit clear preferences in favour of the introduction of marinas, hotels and restaurants and public services, and are against port or productive activity. These results, obtained through the use of conventional poll techniques are completed with Conjoint Analysis questions that are more novel in the area of urban studies.

The Conjoint Analysis experiment confirmed preferences of the inhabitants regarding the uses. However, it failed to measure a significant influence of cost and conservation. This observation persisted even when considering segmentations, except for a very limited number of segments (mainly cost for women, conservation for youngest and most educated interviewed). Other modelling techniques, which are more capable of dealing with preferences' heterogeneity, have been implemented on our data set. Latent Class models proved to be relatively inefficient to identify relevant clusters. Mixed Logit provided a better result, where one cost coefficient (10 years taxes) and one conservation coefficient (25 % most valuable heritage) proved significant. This latest model indicated the existence of considerable heterogeneity among the data.

As far as policy implications are concerned, our conclusions are manifolds. First, the strong preference in favour of touristic and leisure oriented uses (marinas, hotel and restaurants) appears very clearly. The reluctance to port and industrial uses is also very strong and is conflicting with the evidence that such uses contribute to the prosperity of the city, and that locations, alternative to the Old Port, are barely available in the Trieste area, except for limited extensions in the easternmost part of the city (New Port). As far as conservation is concerned, the authors can only acknowledge a conflict between the strong support to conservation expressed by the interviewees in the initial section of the questionnaire (91 % of the interviewees are in favour of conservation, whether 25 % or 50 % of the existing buildings) and the non-significance of the conservation attribute in different estimations based on the Conjoint Analysis data. Our analysis suggests however that the reason for such a result is probably to be searched for in the heterogeneity of inhabitants' preferences. Whether modelling techniques, other than the ones we have implemented, are likely to properly represent how heterogeneity affects preferences for conservation is still an open question. On this point, we hope that other applications of the technique will be available in order to complement our results.

Acknowledgements

The authors gratefully thank numerous colleagues for discussion of early versions of this paper and, in particular, Romeo Danielis, Lucia Rotaris, and the participants to various workshops of the PRUA research program. They also thank Davide Zatti for his patient contribution to the data collection. Research funded by the Italian Ministry of Research PRIN 2005.

References

Boter J., Rouwendal J., Wedel M., (2004), "Employing Travel Costs to Compare the Use Value of Competing Cultural Organizations," *Series Research Memoranda 0011*, Free University Amsterdam, Faculty of Economics Business Administration and Econometrics.

Boxall P., Adamowicz W., (2002), "Understanding heterogeneous preferences in random utility models: a latent class approach", *Environmental and Resource Economics*, 23, 4, pp. 421- 446.

Garrod, G., Willis, K.G., Bjarnadottir, H. and Cockbain, P. (1996) "The Nonpriced Benefits of Renovating Historic Buildings - A Case Study of Newcastle Grainger Town", *Cities*, 13, 6, pp. 423-430.

Garrod G., Willis K. G., (1999), "Northumbria - Castles, Cathedrals and Towns", in: *Valuing Cultural Heritage: Applying Environmental Valuation Techniques to Historical Buildings, Monuments and Artefacts*, edited by Navrud, S. and Ready, R. C., Edward Elgar Publishing Ltd., UK.

Hensher, D. A., Rose, J. M., Greene, W. H., (2005), *Applied Choice analysis : a primer*. Cambridge: Cambridge University Press. 742 + xxiv p.

Kemperman A.D.A.M., Timmermans H.J.P., (2006), "Preferences, benefits, and park visits: A latent class segmentation analysis." *Tourism Analysis*. Vol. 11, 4, , pp. 221-230.

Kemperman A.D.A.M., Ponjé M.M.W., Timmermans H.J.P., (2005), "Analyzing heterogeneity and substitution in trip-making propensity to urban parks: A Mixed Logit model." *Tourism Analysis*, 10, 3, pp. 223-232.

Kim S. S., Wong K. K. F, Cho M., (2007), "Assessing the economic value of a world heritage site and willingness-to-pay determinants: A case of Changdeok Palace", *Tourism management*, 28, pp. 317-322.

Kling, R.W., Revier, C., Sable, K. (2004) "Estimating the public good value of preserving a local historic landmark: the role of non-substitutability and citizen information", *Urban Studies*, 41, 10, pp. 2025-2041.

Marin A., (2003), *Il Porto Vecchio di Trieste da vuoto urbano a risorsa per la città,* mimeo.

Morey E., Rossmann, K. G., (2003), “Using Stated-Preference Questions to Investigate Variations in Willingness to Pay for Preserving Marble Monuments: Classic Heterogeneity, Random Parameters, and Mixture Models”. *Journal of Cultural Economics*, 27, 3/4, pp. 215-229.

Pearce D., Mourato S., Navrud S., Ready R. C., (2002), "Review of existing studies, their policy use and future research needs", in: *Valuing cultural heritage, applying environmental valuation techniques to historic buildings, monuments and artefacts*, edited by Navrud, S. and Ready, R. C., Edward Elgar publishing Ltd, UK.

Pollicino, M., Maddison D (2001) 'Valuing the Benefits of Cleaning Lincoln Cathedral', *Journal of Cultural Economics*, 25, 2, pp. 131–148.

Appendix

Questionnaire

The University of Trieste is making a study on the future of Old Port,
(…)

1. First of all, we would like to ask you a few general questions

2. Are you resident in Trieste (city and Province)? Y/N

3. or do you leave (incl. temporarily) in Trieste anyway? Y/N

4. In which commune are you leaving?
(list ...)

5. In which neighbourhood (only for people leaving in Trieste city)?
(list ...)

6. Since how long do you leave in Trieste (years)?

7. Can you describe us, in a few words, where is located the Old Port?
(Based on the description provided, the interviewer classifies the interviewee in one of the three categories)
1 - answer is correct
2 - answer is partly correct
3 - answer is wrong

8. Did you already enter the Old Port?
1 - never
2 - yes, once
3 - yes, more than once

9. In which occasion(s)?.............................

10. What would you say is the main use of Old Port today (one single answer)?
(list … 9 uses + unused)

11. We will now ask you a few questions about the future of Old Port. We will specifically ask you to think about various possible use of the Old Port.

12. How would you assess these potential reuses of the Old Port?
Please, give a rate from 1 (not important) to 10 (very important).
(list of 9 uses)

We will now ask you which future use of the Old Port seems the most prioritary to you. In other words, which uses should be implemented first?

13. Rank the following uses by order of priority.
(list of 9 uses)

14. In the prospect of a reuse of Old Port, could you indicate us which of these two possibilities would you prefer?
  1 - Make the area prevalently pedestrian
  2 - Create streets inside the area

15. In the prospect of reusing Old Port, how much do you think the creation of new roads for connecting Old Port with main road infrastructure is important?
  1 - very important
  2 - quite important
  3 - not very important
  4 - not important at all

16. As far as existing buildings of the area are concerned, how far should they be protected?
1 - only buildings with high heritage value (25% of the buildings)
2 - buildings with high and intermediate heritage value (50% of the buildings)
3 - none. The whole area should be reconstructed

CBC section:

In this section, we would like to ask you about your preferences for various scenarios for the future of the Old Port. Three different possibilities for the reuse of Old Port will be presented to you. The first two are defined by a set of attributes. The third one corresponds to the current state of Old Port. We would ask you, each time to indicate what is your preferred alternative.

17. eight choices set are presented to the interviewees.

18. In the choice sets that we have just presented you, do you remember how was proposed to finance the reuse of Old Port (up to 3 answers).
1 - one year tax
2 - 10 year tax
3 - permanent tax
4 - 2 years tax
5 - none among these 4

We now would like to make a few questions about you

19. Education
1 - University degree
2 - Secondary school diploma
3 - Primary school (final)
4 - Primary school (intermediate)
5 - No diploma

20. Are you?
1 - self employed
2 - employee (public sector)
3 - employee (private sector)
4 - Retired
5 - Student
6 - looking for a job

21. What is your profession? ……………………………………

22. Can you indicate your age?
  1 - from 18 to 24
  2 - from 25 to 34
  3 - from 35 to 44
  4 - from 45 to 54
  5 - from 55 to 64
  6 - from 65 to 74
  7 - over 74

23. In which interval is your income (personal, after taxes, per year, euro)?
  0 - non income
  1 - < 7.500 euro
  2 - from 7.500 to 10.000
  3 - from 10.000 to 15.000
  4 - from 15.000 to 25.000
  5 - from 25.000 to 40.000
  6 - from 40.000 to 75.000
  7 - > 75.000

(If answer to question 23 is 0)
24. In which interval are the revenues of your household (after taxes, year)?
  0 - no income,
  1 - < 7.500 euro
  2 - from 7.500 to 10.000
  3 - from 10.000 to 15.000
  4 - from 15.000 to 25.000
  5 - from 25.000 to 40.000
  6 - from 40.000 to 75.000
  7 - > 75.000

(If answer to question 23 is >0)
25. What percentage of the total household revenue does your personal revenue represent?