

Valutazione Economica degli Interventi di Salvaguardia e Protezione Ambientale nella Laguna di Venezia

THE ROLE OF LIABILITY, REGULATION, AND ECONOMIC INCENTIVES IN BROWNFIELD REMEDIATION AND REDEVELOPMENT: EVIDENCE FROM SURVEYS OF DEVELOPERS

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Research Questions

1. What economic incentives (policy instruments) encourage developers' cleanup and redevelopment of industrial and contaminated sites?
2. What type of infrastructure and characteristics of a site make it potentially attractive for cleanup and reuse, and to what kind of developers?
3. Does contamination stigma really exist?

A Survey of Developers

- Stated Preferences approach
- **Conjoint choice questions** to study the responses of real estate developers to different mixes of incentives and different site characteristics
- Survey administered at the Marche' International des Professionnels de l'Immobilier (MIPIM), Cannes, March 2002
- 293 in-person interviews
- Respondents represent firms that operate in Europe, North America, Asia

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The Econometric model

- Random Utility Model:
Respondents select the alternative with the highest profit or utility
- If the error terms ε are independent and identically distributed and follow the type I extreme value distribution, the probability that alternative k is selected out of K alternatives is:

$$\Pr(\text{resp. } i \text{ chooses } k) = \frac{\exp(\mathbf{w}_{ik} \alpha)}{\sum_{j=1}^K \exp(\mathbf{w}_{ij} \alpha)}$$

where:

w is a vector containing the alternative-specific attributes and α is the vector of coefficients

- This is the contribution to the likelihood function in a conditional logit model

Site choice

Now, we would like to ask you to choose between two hypothetical areas to develop. For each question, you will be described two hypothetical sites and will be asked to choose which one you believe is the more attractive of these two sites, based on the characteristics of the site.

In answering the following questions, please imagine that you are considering development projects of value/size similar to those of your company's typical project. The development project will be in the country or countries where your company generally does its business. Please be assured that your answers will be kept strictly confidential.

CHOICE 1

Attributes	SITE A	Site B
Site contamination	Present	Present
Transportation network available within 20 km	Highway	Highway and railroad
Certificate of no further action	Yes	No
Oversight by government agency	Response to developer's application within 6 months	Response to developer's application within 6 months
Cleanup standards	Flexible	Flexible
City within 20 km	Present	Present
Government financial incentives as % of the value of the project	20%	10%

Which project do you find more attractive between A and B?

A

B

If you were to choose between A, B, and the option of not participating in either of the two projects, which would you choose?

A

B

Neither

Microsoft Excel - mipimcompleto

File Modifica Visualizza Inserisci Formato Strumenti Dati Finestra ? Digitare una domanda.

100% Arial 10

	A	B	C	D	E	F	G	H	I	J	K	
1	ID	language	interviewer	self-complete	sector	profile	sell	keep	lease	corebusiness	developer	pi
2	1	english		yes	private	no	n/a	n/a	n/a	n/a	n/a	n/
3	2	italian	e	yes	private	no	n/a	n/a	n/a	n/a	n/a	n/
4	3	english	f	no	private	yes	yes	no	no	yes	yes	n/
5	4	english	f	no	private	yes	yes	yes	no	yes	yes	n/
6	5	english	e	no	private	yes	yes	no	no	yes	yes	n/
7	6	english	e	no	private	no	n/a	n/a	n/a	n/a	n/a	n/
8	7	english	f	no	private	yes	yes	no	no	yes	yes	n/
9	8	english	e	no	private	yes	yes	no	yes	yes	yes	n/
10	9	english	e	no	npo	no	n/a	n/a	n/a	n/a	n/a	n/
11	10	italian	e	no	private	yes	yes	yes	yes	yes	yes	n/
12	11	english	e	no	private	yes	yes	no	no	yes	yes	pi
13	12	english	f	yes	private	yes	no	yes	no	yes	no	pl
14	13	english	f	no	govt	no	n/a	n/a	n/a	yes	yes	n/
15	14	italian	f	no	govt	no	n/a	n/a	n/a	n/a	n/a	lo
16	15	english	e	no	private	yes	yes	yes	n	yes	yes	n/
17	16	italian	e	no	private	yes	yes	no	no	no	yes	n/
18	17	italian	f	no	private	yes	yes	no	no	yes	yes	n/
19	18	italian	f	no	private	no	n/a	n/a	yes	no	no	pi
20	19	italian	f	no	private	no	n/a	n/a	yes	no	no	fi

Foglio1 Foglio2 Foglio3

Pronto

Start Eu... riu... MI... A... pr... be... Mi... 11.42

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Descriptive statistics

Company characteristics	Complete sample (293 respondents)
Average number of employees	3,733
Average land area of project	232,000 m ²
Median revenue of project	€ 7 million
Experienced with contaminated sites	47%
Primary activity of firm:	
Commercial projects	28%
Office projects	25%
Residential projects	18%
Industrial projects	15%
Other projects	14%

Analysis of the responses: Conditional Logit Model. Cleaned Sample.

(8 subjects with “reversals” excluded; N=2239) [* = sign. At 10%; ** = sign at 5%; *** = sign. At 1%]

Attribute	Coefficient	T statistic
CONTAM_P (Contaminated)	-0.9994**	-2.124
CONTAM_C (Cleaned Up)	0.2848	0.603
CONTAM_A (No contamination)	0.2524	0.538
HIGHWAY	-2.2667*	-1.685
PORT	0.4095***	4.627
RAILROAD	1.8187	1.453
AIRPORT	0.3117***	3.638
CITYPRES (City within 20 km)	1.0562***	14.124
INCENT (Financial Incentive)	0.0274***	6.258
CERTIFIC (Certification w/ liability relief)	0.5740***	7.835
OVERS (Max months for response from agency)	-0.0423***	-10.560
FLEXSTDS (Flexible cleanup standards)	0.2895***	4.119

Analysis of the responses: Conditional Logit Models with Interactions between attributes and experience with contaminated sites. N=2239

	Coefficient	T statistic
<i>Site characteristics</i>		
CONTAM_P	-1.2102	-2.532
CONTAM_C	0.2171	0.462
CONTAM_A	0.1968	0.424
HIGHWAY	-2.4220	-1.802
PORT	0.2164	4.658
RAILROAD	2.0647	1.650
AIRPORT	0.3186	3.697
CITYPRES	1.0657	14.159
<i>Policies</i>		
INCENT	0.0119	2.177
CERTIFIC	0.5836	5.771
OVERS	-0.0471	-8.765
FLEXSTDS	0.3513	3.543
<i>Interaction terms</i>		
INCENT×experienced with contaminated sites	0.0335	4.600
CONTAM_P×experienced with contaminated sites	0.2654	1.642
CERTIFIC×experienced with contaminated sites	0.0145	0.099
OVERS×Experienced with contaminated sites	0.0085	1.151
FLEXSTDS×Experienced with contaminated sites	-0.1444	-1.053
Log likelihood function	-1552.36	

Probability of selecting the contaminated site vis-à-vis a pristine site
 Site A=contaminated site with policy incentives
 Site B=pristine site with no policy incentives

Probability of selecting A over B (Percent)					
Policy incentive offered at site A	(1) All	(2) Developers with contaminated site experience	(3) Developers with NO contaminated site experience	(4) Large firms	(5) Small firms
10% financial assistance	27.33	33.43	21.62	25.00	28.74
20% financial assistance	33.10	44.19	23.70	27.75	36.33
Liability relief alone	33.67	36.74	30.50	32.37	34.35
20% financial assistance + liability relief	46.76	59.01	35.77	38.87	51.16
Flexible cleanup standards	27.64	28.19	25.81	28.23	27.39
20% financial assistance + flexible cleanup standards	39.79	49.33	30.62	34.32	34.32
20% financial assistance + liability relief +flexible cleanup standards	53.98	63.91	44.17	46.39	46.39

Marginal Price of the Attributes and Policies, based on the median project value (€ 7 million)

	Complete Sample	Experience with contaminated sites	No Experience with contaminated sites	Larger Firms	Smaller Firms
CONTAM_P	€2.549 (1.267)*	€1.455 (0.702)*	€7.119 (4.310)	€5.029 (3.306)	€2.081 (1.015)*
CERTIFIC	€1.464 (0.302)*	€0.921 (0.209)*	€3.433 (1.743)*	€2.521 (1.384)	€1.240 (0.271)*
OVERS	€0.108 (0.019)*	€0.059 (0.010)*	0.277 (0.127)*	€0.164 (0.076)*	€0.096 (0.016)*
FLEXSTDS	€0.738 (0.222)*	€0.318 (0.164)	€2.066 (1.172)	€1.540 (1.029)	€0.572 (0.204)*

Conclusions I

- Developers appreciate...
 - Financial incentives
 - Fast-track review of re-development and cleanup plans
 - Flexible cleanup standards
- Which site characteristics are important?
 - Presence of contamination
 - Availability of transportation network
 - Presence of a city within 20 km

Conclusions II

- Developers' preferences do not provide support for the existence of contamination stigma, but...
- Contamination does deter investments
- Contrary to claims by Meyer et al. (1997), liability does matter
- Developers with experience with contaminated sites are less deterred by contamination issues
- Larger firms do not seem different from others, but keep in mind our sample tends to have large developers