

Does Community Eco-Certification Attract Business? Costa Rica's Blue Flag Program

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Outline

- Motivation
- Blue Flag Program (Costa Rica)
- Research question
- Methodology and data
- Results
- Discussion

VEPs

- Fast, unplanned, environmentally aggressive coastal development threatens Costa Rica's coasts.
 - Communities need to take a stronger pro-environment position
- Latin America ➔ is starting to turn into voluntary approaches to address environmental problems
 - Provide incentives, but not mandates
- In Costa Rica the government had implemented a voluntary environmental program (VEP) to address this coastal development
 - Collective VEP ➔ Blue Flag Program

Collective VEPs

- *Collective* VEPs seek to promote enhanced environmental protection of entire geographic areas
 - join efforts of business and other organizations (NGOs, government agencies, etc.)
- Little is know about the use of *Collective* VEPs in developing countries
- To our knowledge have yet to be rigorously evaluated in either industrialized or developing countries.

Differences in countries

- Industrialized countries vs. developing countries (Blackman and Sisto 2006)
 - Industrialized countries used VEP to over comply with mandatory regulations
 - Developing generally use it to help poorly performing mandatory regulation

Literature review - CSR

- Link between corporate social responsibility (CSR) and corporate profits in industrialized countries (Reinhardt et al. 2008; Margolis et al. 2007; Portney 2008).
 - CSR → actions taken to improve environmental quality, worker health and safety, and/or community welfare that are not required by law
 - CSR does not usually entail significant losses, neither does it generate significant profits.

Certification benefits

- Certificate of Sustainable Tourism for hotels in Costa Rica (Rivera, J. 2002)
 - suggest certified hotels are able to charge higher prices
 - provides clear and credible indications of superior environmental performance
- Would a *collective* VEP have the same effect?
 - Tourists value the overall environmental quality of beach communities (Frampton 2010)
 - BFP provide a credible independent signal of environmental quality
 - Hotels should attract more customers and/or higher price premiums

Counterfactuals

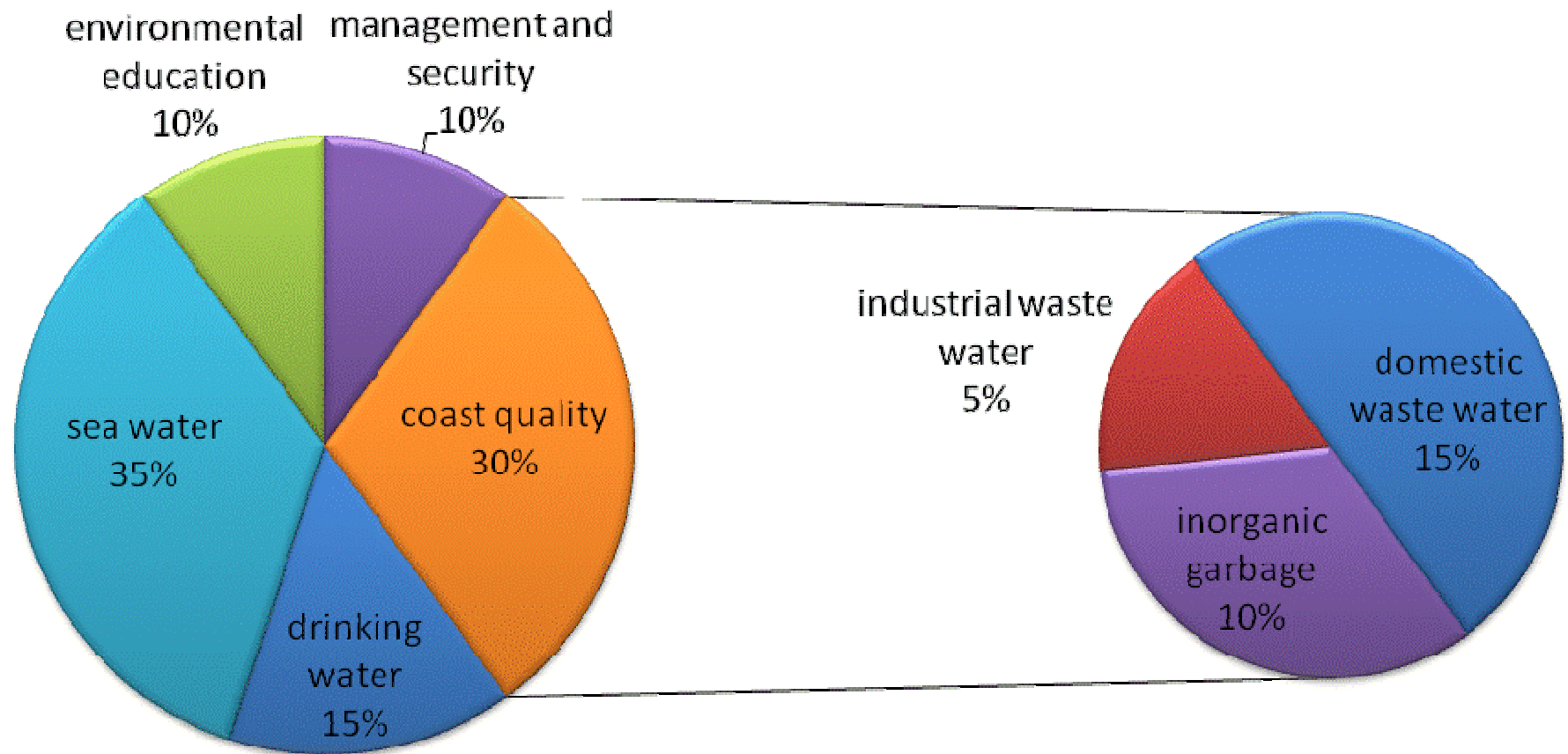
- To be credible evaluations must construct a reasonable counterfactual
- Literature review on sustainability certification Blackman and Rivera (2011)
 - limited evidence of the economic benefits of certification
 - 46 out of 210 studies; 11 developed a credible test; 4 found economic benefits of certification (1 bananas, 2 coffee, 1 tourism)

Blue Flag Program (BFP)

- International self-regulatory initiative (40 countries)
- In Costa Rica started in 1996
- Objective: to provide incentives to communities in costal areas to protect the sea water and beaches from environmental pollution.
- Inter-institutional commission with main responsible → National Water Laboratory
- Collective VEP for Communities



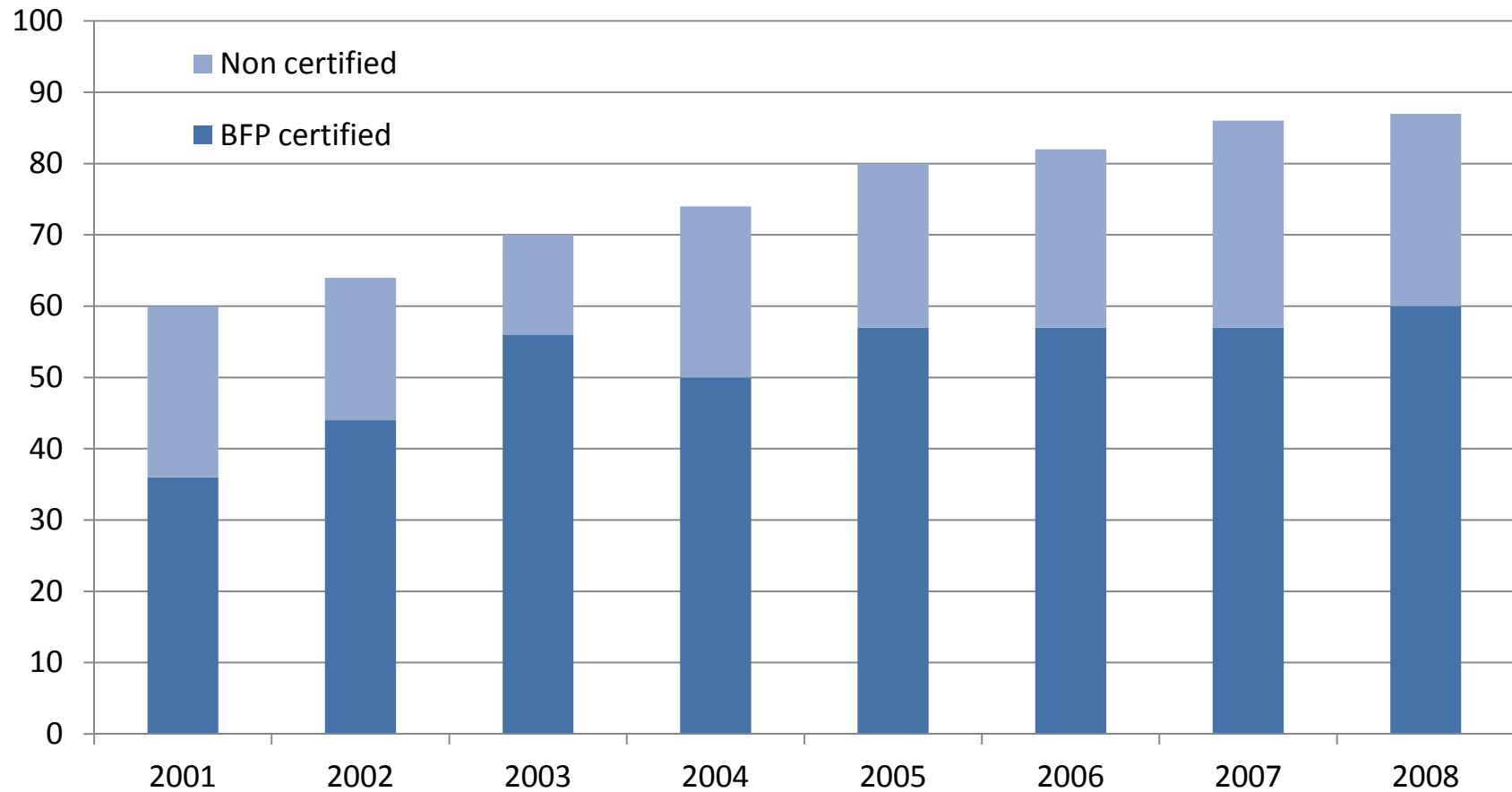
BFP evaluation parameters



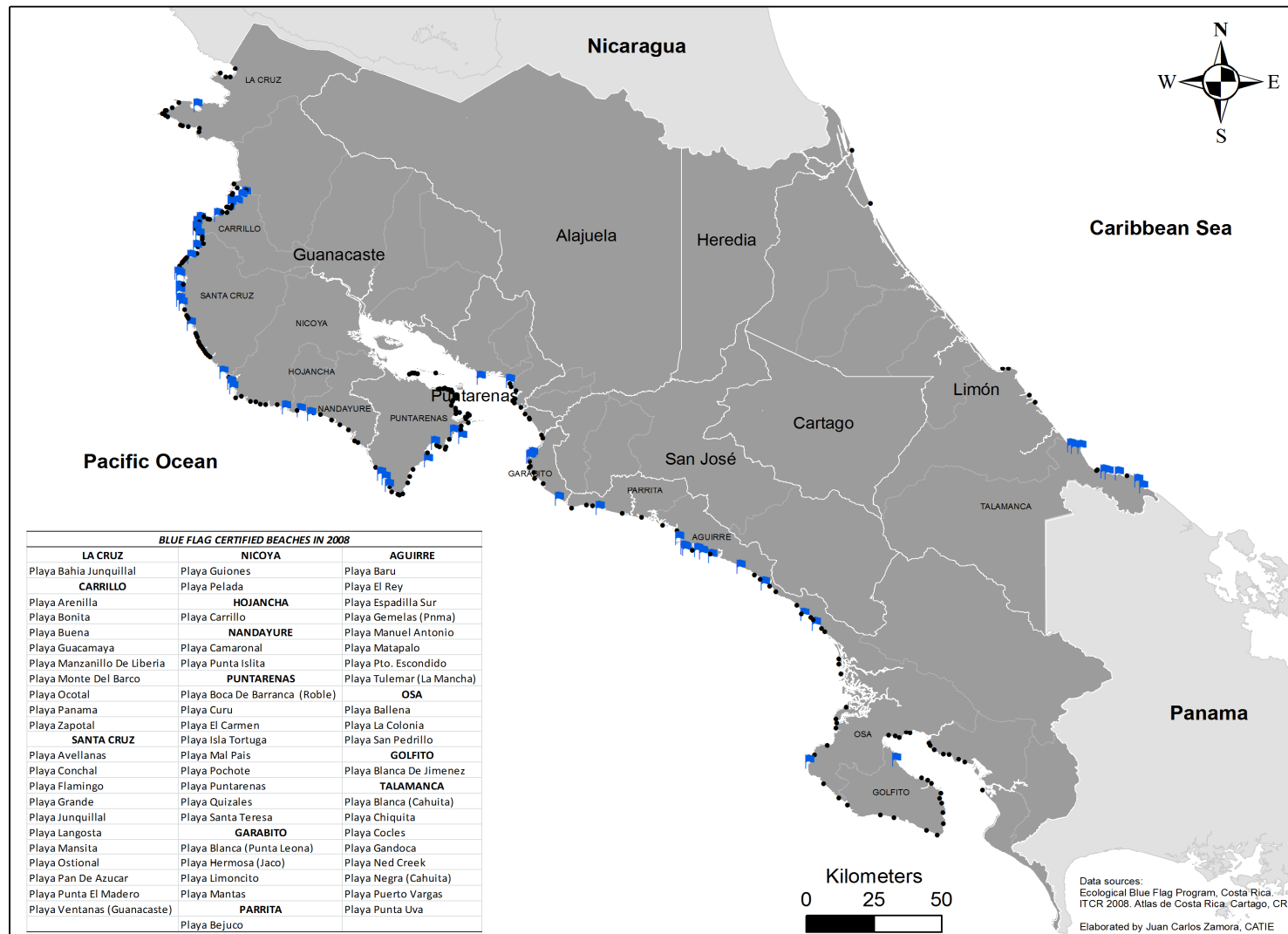
Source: LNA, AyA

Blue Flag Program (BFP)

Beach community participation in Blue Flag Program, 2001-2008



Blue Flag certified beaches, 2008



Research question

- Does Costa Rica's Blue Flag Program attract hotel investment?



Methodology: matching

- What would have been a community's number of new hotels without BFP certification?
 - Compared with the estimated **counterfactual**
 - **Control group** of communities with similar characteristics as certified communities – **the treated group**- (Dehejia & Wahba, 1999; Hill, Walfogel, & Brooks, 2002)
 - Propensity score matching (Rosenbaum and Rubin, 1983)

Methodology– selection bias

- Control selection bias of observable variables (Caliendo and Kopeinig, 2008; Ho et al., 2007)
 - Beach communities self-select into the BFP
- Propensity scores for each community
 - predicted probability of treatment (BFP certification) from a probit regression
 - Nearest neighbor 1-to-4 matching method with a caliper of 0.01 to identify up to four non-certified matches for each certified community
- Fixed effects
 - control for unobserved fixed effects of communities, including those fixed effects generated by self-selection

Methodology - Data

- **281 beaches** open for tourism in Costa Rica (GIS located)
 - Blue Flag **certification status** (1996-2008) from the National Water Laboratory
 - **Registered hotels** in Costa Rica between 2001-2008 at Costa Rican Tourism Institute (GIS located)
 - Community **socioeconomic characteristics** from the 2000 Costa Rican Population Census
 - Beach **geographic data** from the 2008 Atlases of Costa Rica
- ➔ Panel database with **2,248 observations**

Results: Matching balance

Variable	BFP certified (n=417)	Unmatched uncertified (n=1,831)		Matched uncertified (n=822)	
	Mean	Mean	Difference	Mean	Difference
Geophysical					
Distance national parks (km)	14.85	15.80	-1.91	14.94	-0.09
Distance river (km)	2.34	2.63	-0.27	2.10	0.24
Secondary roads (km)	10.27	12.49	-3.80***	11.15	-0.88
Primary roads (km)	0.91	0.38	0.50**	0.91	-0.00
Rainfall (mm)	2,917.56	2,844.28	2.66	2,880.33	37.20
Rainfall squared (mm)	9,200,763.7	9,205,269.53	-362,941.83	9,148,457.15	52,306.55
Socioeconomic					
Foreign population	19.32	12.13	10.69**	19.02	0.30
Income inequality	0.48	0.49	-0.01***	0.48	0.00
Population. density	41.73	33.51	90.57***	40.11	1.62
Poverty	17.96	23.36	-6.45***	17.99	-0.027
Safety	0.62	0.61	0.04*	0.63	-0.00
Study average years	7.52	6.71	1.12***	7.33	0.19
Political participation	0.60	0.58	0.02	0.61	-0.00

Results – hotel investment

Ordinary least squares fixed effect regression models

Variable	Model 1 Full sample (Hotels)	Model 2 Matched sample (Hotels)	Model 3 Full sample (Hotel rooms)	Model 4 Matched sample (Hotel rooms)
BFP certification (t-1)	0.01 [0.03]	-0.01 [0.04]	-1.97 [3.33]	-2.53 [3.16]
BFP certification (t-2)	0.10*** [0.03]	0.07* [0.04]	5.45* [3.28]	5.35* [3.11]
Fixed effects	yes	yes	yes	yes
Observations	1,686	822	1,686	822
Prob > F	0.00	0.09	0.00	0.00
Number of beaches	281	137	281	137

Standard errors in brackets ; *** p<0.01, ** p<0.05, * p<0.1

- No significant effects in the first year period
- Positive and significant results for hotel investment in two year period
- New hotels are more likely to locate in BFP certified communities

Ordinary least squares fixed effect regression models for matched sample using alternative dependent variables—hotel and hotel rooms of different quality

Variable	Model 5 <i>(0-1 star hotels)</i>	Model 6 <i>(2-3 stars hotels)</i>	Model 7 <i>(4-5 stars hotels)</i>	Model 8 <i>(0-1 star hotel rms)</i>	Model 9 <i>(2-3 stars hotel rms)</i>	Model 10 <i>(4-5 stars hotel rms)</i>
BFP certification (t-1)	-0.04 [0.03]	0.03* [0.02]	0.00 [0.02]	-0.83 [0.60]	-0.47 [0.50]	-1.23 [3.08]
BFP certification (t-2)	-0.00 [0.03]	0.03 [0.02]	0.05* [0.03]	0.01 [0.47]	0.34 [0.59]	5.01* [3.02]
Observations	822	822	822	822	822	822
R-squared	0.016	0.019	0.034	0.021	0.047	0.028
Number of beaches	137	137	137	137	137	137

Standard errors in brackets ; *** p<0.01, ** p<0.05, * p<0.1

- 4-5 stars hotels and hotel rooms generate positive and significant coefficients for BFP certification lagged two years
- Additional support for our finding that BFP attracts new hotel investment
- In particular new luxury hotel investment

Discussion

- We found that past BFP certification is positively and significantly—albeit weakly—correlated with new hotel investment, particularly investment in luxury hotels.
- Findings suggest that BFP has significant private benefits for local hotels.
 - We assume that the causal mechanism for the correlation has to do with signaling (not tested directly)
 - BFP certification provides a credible signal of overall environmental quality of beach communities to tourists, and therefore increases demand for hotel rooms in certified beaches

Discussion – Policy implications

- Results suggest that collective VEPs can generate private benefits for local businesses
- VEPs apt to attract participants and at least have the potential to improve environmental quality
- Boost local economies
- Cautionary note:
 - Collective VEPs may attract new businesses, they also will put additional pressure on the environment and presumably on the VEPs themselves.



Thank you!

Extra slides

Number of hotels and hotel rooms in 281 beach communities, 2001-2008

Year	Hotels	Hotel rooms
2001	63	2097
2002	63	2205
2003	64	2741
2004	65	2877
2005	70	3141
2006	70	3012
2007	72	2891
2008	75	3553

Average number of hotels near beach community centroid, by distance and Blue Flag certification status (s.d.)

Variable	BFP certified (n=417)	Uncertified (n=1,831)	Differences ^{1,2}
Segment	0.90 (1.59)	0.45 (0.98)	***
Within 5 km	29.14 (22.53)	17.42 (18.40)	***
Within 10 km	48.61 (26.72)	32.22 (25.83)	***
Within 15 km	63.82 (26.86)	47.22 (26.67)	***
Within 20 km	79.15 (30.47)	66.01 (34.53)	***

* prob<0.10 ; ** prob<0.05; *** prob < 0.01

¹ t –test where Ho: equal means.

² Satterthwaite’s nonparametric approximation generates results that are qualitatively identical.

Results: Probit model (BFP certification)

Variables	Coefficient	Marginal effect
Geophysical		
Distance national parks (km)	-0.02** [0.01]	-0.01*** [0.00]
Distance river (km)	-0.11* [0.06]	-0.03* [0.02]
Secondary roads (km)	-0.02* [0.01]	-0.00* [0.00]
Primary roads (km)	0.16** [0.07]	0.04** [0.02]
Rainfall (mm)	0.00 [0.00]	0.00 [0.00]
Rainfall squared (mm)	-0.00 [0.00]	-0.00 [0.00]
Socioeconomic		
Foreign population	0.03*** [0.01]	0.01*** [0.00]
Income inequality	-10.14* [5.45]	-2.81* [1.49]
Population. density	0.00** [0.00]	0.00** [0.00]
Poverty	-0.02** [0.01]	-0.01** [0.00]
Safety	1.03* [0.61]	0.29* [0.17]
Study average years	0.06 [0.07]	0.02 [0.02]
Political participation	2.94* [1.58]	0.81** [0.42]
Intercept	0.94 [2.83]	
N	281	
Log-Likelihood	-119.7615	
Likelihood Ratio X Square	78.15	
Pseudo R-Squared	0.2460	

Dependent variable: BFP certification (unmatched smaple)

*** p<0.01, ** p<0.05, * p<0. Standard errors in brackets

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	[0.03]	[0.04]	[3.33]	[3.16]
BFP certification (t-2)	0.10***	0.07*	5.45*	5.35*
	[0.03]	[0.04]	[3.28]	[3.11]
d2003	-0.02	-0.07***	-6.94***	-8.91***
	[0.02]	[0.03]	[1.83]	[1.95]
d2004	-0.05***	-0.06**	-3.86**	-6.46***
	[0.02]	[0.03]	[1.82]	[1.96]
d2005	-0.02	-0.03	-3.03*	-4.96***
	[0.02]	[0.02]	[1.82]	[1.80]
d2006	-0.03	-0.04	-3.78**	-5.37***
	[0.02]	[0.02]	[1.82]	[1.84]
d2007	-0.04**	-0.04	-10.94***	-11.42***
	[0.02]	[0.03]	[1.81]	[3.03]
Constant	0.55***	0.74***	31.94***	43.76***
	[0.01]	[0.03]	[1.53]	[1.98]
Fixed effects	yes	yes	yes	yes
Observations	1,686	822	1,686	822
Prob > F	0.00	0.09	0.00	0.00
Number of beaches	281	137	281	137

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BFP certification (t-2)	-0.00 [0.03]	0.03 [0.02]	0.05* [0.03]	0.01 [0.47]	0.34 [0.59]	5.01* [3.02]
d2003	-0.01 [0.02]	-0.02 [0.02]	-0.04*** [0.01]	-0.32 [0.42]	-2.26*** [0.72]	-6.33*** [1.79]
d2004	-0.01 [0.02]	-0.03 [0.02]	-0.02 [0.02]	-0.37 [0.33]	-2.24*** [0.73]	-3.85** [1.81]
d2005	-0.02 [0.02]	-0.01 [0.02]	-0.01 [0.01]	-0.54 [0.36]	-1.89*** [0.72]	-2.53 [1.64]
d2006	-0.01 [0.02]	-0.02 [0.02]	-0.01 [0.01]	-1.07** [0.50]	-1.96*** [0.71]	-2.34 [1.65]
d2007	-0.00 [0.02]	-0.01 [0.02]	-0.03* [0.01]	-0.18 [0.32]	-3.38*** [0.99]	-7.86*** [2.86]
Constant	0.12*** [0.02]	0.42*** [0.02]	0.20*** [0.01]	1.94*** [0.39]	11.96*** [0.74]	29.86*** [1.83]
Observations	822	822	822	822	822	822
R-squared	0.016	0.019	0.034	0.021	0.047	0.028
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