



UvA-DARE (Digital Academic Repository)

Explaining the enforcement gap in China: Local government support and internal agency obstacles as predictors of enforcement actions in Guangzhou

Lo, C.W.H.; Fryxell, G.E.; van Rooij, B.; Wang, W.; Li, P.H.

DOI

[10.1016/j.jenvman.2012.07.025](https://doi.org/10.1016/j.jenvman.2012.07.025)

Publication date

2012

Document Version

Final published version

Published in

Journal of Environmental Management

[Link to publication](#)

Citation for published version (APA):

Lo, C. W. H., Fryxell, G. E., van Rooij, B., Wang, W., & Li, P. H. (2012). Explaining the enforcement gap in China: Local government support and internal agency obstacles as predictors of enforcement actions in Guangzhou. *Journal of Environmental Management*, 111, 227-235. <https://doi.org/10.1016/j.jenvman.2012.07.025>

General rights

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <https://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

UvA-DARE is a service provided by the library of the University of Amsterdam (<https://dare.uva.nl>)



Explaining the enforcement gap in China: Local government support and internal agency obstacles as predictors of enforcement actions in Guangzhou

Carlos Wing-Hung Lo^a, Gerald E. Fryxell^b, Benjamin van Rooij^c, Wei Wang^{d,*}, Pansy Honying Li^a

^a Department of Management and Marketing, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong

^b China Europe International Business School, 699 Hongfeng Road, Pudong, Shanghai 201206, People's Republic of China

^c Faculty of Law, Amsterdam University School of Law, Oudemanhuispoort 4-6, 1012 CN Amsterdam, Netherlands

^d Management School, Jinan University, 601 Huangpu Ave W, Guangzhou, Guangdong Province 510632, People's Republic of China

ARTICLE INFO

Article history:

Received 13 September 2011

Received in revised form

3 June 2012

Accepted 25 July 2012

Available online 30 August 2012

Keywords:

China

Environmental protection

Local government support

Local environmental protection bureau

Enforcement gap

ABSTRACT

This study investigates how local government support for enforcement and internal agency obstacles explain the enforcement gap in Guangzhou, China. It was found that agency obstacles associated with insufficient resources and job ambiguity, in particular, affect enforcement officials' perceptions of enforcement difficulty. Somewhat more surprisingly, however, local government support was *not* found to be a significant predictor of these perceptions. In addition, this study identified four significant relationships associated with specific enforcement actions. First and second, perceptions of enforcement difficulty appear to lead to fewer inspections, but also have a weak *positive* effect on the frequency of fines levied. Third, poor coordination within the bureau was found to be associated with fewer violations being processed. Fourth, and contrary to expectations, local government support was found to *suppress* the frequency of inspections while having no significant effect on violations or fines. Overall, these findings suggest that increased local government support for the enforcement of environmental regulation in China may not necessarily lead to more rigorous enforcement, at least if enforcement rigor is measured in terms of inspections, citations and fines.

© 2012 Elsevier Ltd. All rights reserved.

1. Introduction

The path to better regulatory control of industrial pollution in China has proven to be elusive, with a sizable “enforcement gap”—the disparity that persists between laws on the books and actual compliance (Lo et al., 2006). Paradoxically, this disparity appears to be well entrenched within the system of governance in spite of a period of increasing political verbiage emanating from the highest levels of government and an expanding regime of enlightened environmental laws and regulations. Local governments have also had imposed upon them an “environmental quality administrative leadership responsibility system” while, at the same time, local environmental protection bureaus (EPBs) have been instructed to prioritize regulatory enforcement over the collection of pollutant-discharge fees to finance their operations (Lo and Tang, 2006). All this raises a host of questions about why

these regulations have proven to be unenforceable. In particular, what factors are most responsible for undermining regulatory enforcement?

Given the size and urgency of this problem, there has been considerable speculation about its causes. Unfortunately, however, little of this speculation has been backed up with hard data, nor has the discourse been very well informed by the foot soldiers of enforcement—the environmental enforcement officials themselves. Accordingly, the purpose of this study is to attempt to address these shortcomings by empirically investigating a number of key relationships between the most common putative obstacles to regulatory enforcement and measures of enforcement officials' perceptions of how difficult it is to do their job, as well as their estimates regarding the frequency with which they engage in specific enforcement actions.

2. Literature review and conceptual development

The term “enforcement gap”, as used in this study, refers to a disparity between practices as specified by the government (the regulators) as legal requirements (the regulations) and the actual practices of the targeted group or groups (the regulated). In the

* Corresponding author. Tel.: +86 20 85220180; fax: +86 20 85220179.

E-mail addresses: mcarlos@polyu.edu.hk (C.W.-H. Lo), fryxell@ceibs.edu (G.E. Fryxell), b.vanrooij@uva.nl (B. van Rooij), wangw@jnu.edu.cn (W. Wang), mspany@polyu.edu.hk (P. Honying Li).

specific context of environmental protection in China, this gap refers to the well documented reality that the rather rigorous requirements that are currently on the books are ubiquitously being flouted, causing serious and often life-threatening accidents as well as a variety of more insidious outcomes (e.g., pollution, illness, resource scarcity). Obviously, these effects have enormous economic and human costs that lend considerable urgency to the question of how to reduce them.

As previously mentioned, regulatory enforcement in China—in the form of state reactions to violations of regulatory law in order to secure compliance—has attracted broad attention, including that of scholars from multiple disciplines. Unfortunately, given the huge social, environmental and economic costs of poor enforcement, the bulk of studies on the enforcement gap in China have not been sufficiently rigorous to provide much confidence in ascertaining its actual causes. Most have relied heavily on anecdotal evidence and/or been limited in scope (i.e., focusing on one specific issue in one location). Among the relatively few quantitative studies that have been undertaken, measurement problems have been difficult to surmount, thereby raising questions and doubts regarding key findings. Such concerns arise, for example, from the use of broad perceptual measures of overall enforcement effectiveness and/or the degree of respondents' candor and the intrusion of other desirability biases into such self reports.

Although research in China inevitably faces numerous methodological challenges, this study incorporates a number of features that either fully or partially address some of the most common shortcomings. For one, it integrates both quantitative (i.e., from surveys) and qualitative data (i.e., from interviews). Another feature is that it incorporates data about the frequency of specific enforcement actions (i.e., inspections, citations and fines). Although these are self-reported estimates provided by enforcement officials, they are at least anchored in specific behaviors provided by well-informed respondents. A more detailed description of the methodology of this study is reserved for its proper section.

2.1. Enforcement processes

Matland (1995) distinguished between two different processes related to regulatory enforcement. In the process of *political* implementation, insufficient power becomes the key obstacle to enforcement. In the process of *administrative* implementation, on the other hand, the obstacles emanate largely from within the agency itself (e.g., in the form of poor management or resource deficiencies). Of course, these processes are interdependent as, for example, weak power can result in political appointments to key management positions and/or fewer resources. Regardless, this distinction is useful in pointing out that environmental regulatory enforcement must inevitably embrace both of these processes and both types of obstacles.

2.2. Local government support

Up until the 11th five year plan (2006–2010), it was often asserted that a deficiency of governmental support at *all* levels of administration seriously undermined the overall regulatory effectiveness of local EPBs (Bachner, 1996; Ma and Ortolano, 2000; Lo and Fryxell, 2003). Consistent with evidence of a greater commitment to environmental protection by the central authorities in more recent times, scholars now uniformly focus on inadequate *local* government support as one of the main culprits behind the enforcement gap (e.g., Lo and Fryxell, 2005; Van Rooij and Lo, 2010). It must be emphasized at this point that “local government” in China is not monolithic but consists of a large number of bodies with varying levels of independence from the county or city government. Consequently, there

can be considerable unevenness in support for environmental regulatory enforcement and ample conflict regarding priorities. For the sake of convenience, we will continue to speak of “local government support” in the broader sense, but obviously such fragmentation adds complexity and richness to interrelationships.

In explaining the disconnect between central and local support for environmental protection, one common theme is that at the local level, EPBs continue to be highly disadvantaged in terms of legitimacy, authority and administrative rank vis-a-vis other government bodies (Chan, 1995; Jahiel, 1997, 1998; Ma and Ortolano, 2000; Tilt, 2007). This situation is exacerbated in that local EPBs are under-resourced “vertically” (i.e., from Beijing) and, as a consequence, must secure the bulk of their operating funds “horizontally” from various local government sources or raise funds on their own. Should these local sources be “pro-growth”, have economic priorities of their own (e.g., via participation in local state-owned enterprises), or be corrupted in any way, those resources will invariably have “strings attached” (i.e., be contingent on favoring economic interests). As if this wasn't sufficient to compromise regulatory enforcement, it has also been observed that other local functional departments may “pile on” to put the EPB in its place (Ma and Ortolano, 2000).

Indeed, this practice of so-called “local protectionism” (i.e., where local governments provide the bulk of EPB resources and, as a consequence, exert a direct influence on EPB leadership appointments) is often cited as the main reason for the enforcement gap. Recognizing this, higher levels of government have from time to time attempted to overcome the inertia from this practice through various programs including enforcement campaigns (Van Rooij, 2002, 2006; Economy, 2004), vertical management reforms, recentralizing budgets, and/or imposing authority over appointments (Mertha, 2005; Van Rooij, 2006). Overall, however, such efforts have proven ineffective because they fail to resolve more fundamental structural problems of resource dependency, weak agency capacity, and conflicting interests (Mertha, 2005; Van Rooij, 2006). Recognizing that insufficient local government support is a major obstacle to regulatory enforcement, it is hypothesized that:

H1: Local government support for enforcement will *decrease* perceptions of enforcement difficulty among environmental enforcement officials.

H2: Local government support for enforcement will *increase* the frequency of enforcement actions.

2.3. Internal agency obstacles to regulatory enforcement

The EPB, like any organization, is likely to encounter significant internal obstacles in pursuing its goal of regulatory enforcement (Sinkule and Ortolano, 1995; Tang et al., 1997; Ma and Ortolano, 2000; Tilt, 2007). Staff may be insufficiently trained, for example, thereby limiting their ability to detect violations or rendering them somewhat more “corruptible” in the event that they do (Sinkule and Ortolano, 1995; Jahiel, 1998; Swanson et al., 2001; Van Rooij, 2003, 2006). Outdated testing equipment, limited capacity for on-line monitoring and a shortage of vehicles are common problems associated with resource constraints. Poor management practices can result in poor delegation, confusing and/or conflicting objectives and/or coordination difficulties among units. Indeed, such internal obstacles were often cited as causes of the enforcement gap during our interviews with local enforcement teams in Guangzhou. Moreover, one might expect management-related obstacles to be especially prevalent to the extent that EPB administrators may be politically connected and/or have had relatively little management training; consequently, it is hypothesized that:

H3: Agency obstacles to enforcement will *increase* perceptions of enforcement difficulty among environmental enforcement officers.

H4: Agency obstacles to enforcement will *decrease* the frequency of enforcement actions.

2.4. Perceptions of difficulty and enforcement actions

While obstacles to enforcement will have a direct effect on the frequency of enforcement action, they will also be influenced by the enforcement officials themselves. This seems a reasonable assertion, as perceptions tend to inform behaviors. Thus, an enforcement official may, for example, be sufficiently worn down by their perception of job difficulty resulting, for example, from receiving ambiguous direction from superiors so that they are less motivated to conduct inspections. This is even more possible in that it is often a challenge for EPBs to know what their agents are actually doing when out in the field (Van Rooij, 2003, 2006). Consequently, enforcement officials have ample latitude to manifest their level of motivation and/or to choose an enforcement style that they feel is most appropriate to their task. Thus, it is hypothesized that:

H5: Perceptions of enforcement difficulty will *reduce* the frequency of enforcement actions.

Local government support and agency obstacles have been identified as the two key institutional factors that heavily shape enforcement actions. However, their joint effect has been rarely tested (e.g., Lo and Fryxell, 2005). Such effects seem likely as, for example, local government support would arguably combine with job clarity to give an additional boost to regulatory enforcement. Similarly, good interagency coordination would also appear to be a good candidate to interact with local government support to promote more effect regulatory enforcement. Therefore, we hypothesize that:

H6: Agency obstacles to enforcement and local government support will have joint effects on enforcement officials' perceptions of difficulty in enforcement.

H7: Agency obstacles to enforcement and local government support will have joint effects on the frequency of enforcement actions.

Taken together, these hypothesized relationships are depicted in the structural model shown in Fig. 1.

3. Methodology

3.1. Data collection

The data for this study are taken from surveys conducted among environmental officials in Guangdong Province in the Pearl River Delta (PRD) region of China in the year 2006. The PRD is an appropriate location for this study as it has been among the most rapidly developing areas in China and, with this development, faces some of the most serious environmental challenges as well as pro-growth local government “push-back” on environmental regulations. The surveys were administered with the endorsement and support of the Guangdong Provincial EPB in Guangzhou. To its credit, the Guangzhou EPB has gained some successes in battling emissions (Lo and Tang, 2006).

Before the administration of the survey, a briefing session was held with representatives at each field office. These representatives distributed the questionnaires to officials in their units, collected completed questionnaires, and returned them to the department in charge of the survey in Guangzhou. Surveys were obtained from 154 enforcement officials. Even though the survey was administered anonymously, a number of enforcement officials provided only partial information regarding their enforcement actions. Regardless, 118 officials provided data for the number of inspections per week, 101 for the number of fines they issued per month,

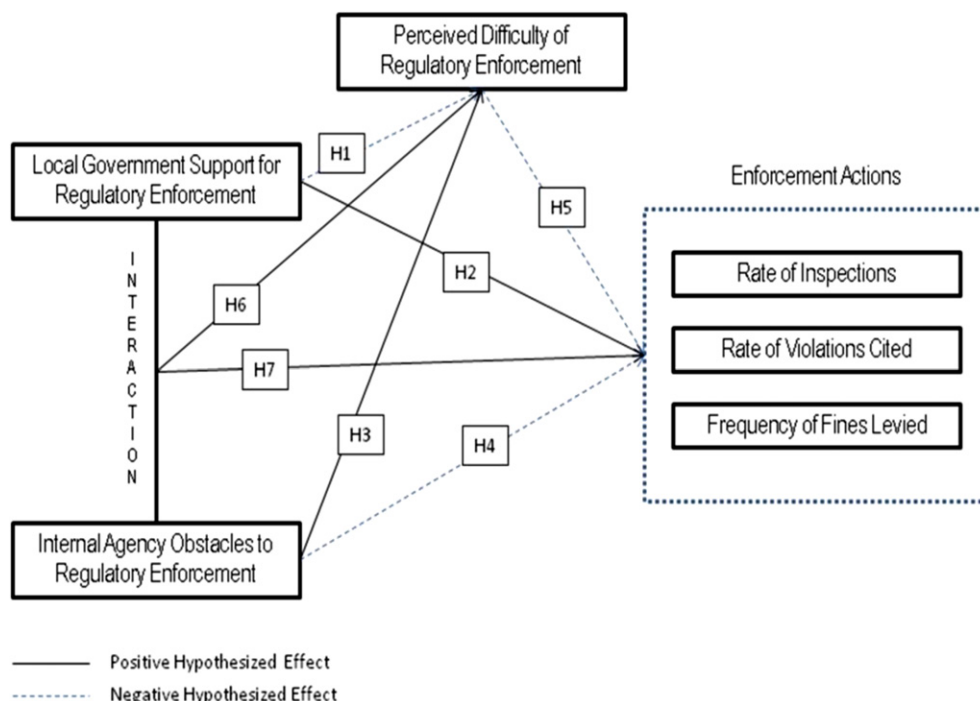


Fig. 1. Model of hypothesized relationships.

and 79 for the number of violations they processed per month. On the other hand, 33 respondents (~21%) provided detailed comments which not only indicated that they had given thoughtful responses, but which provided additional qualitative information that proved helpful in interpreting the findings.

To further strengthen the empirical basis of this study, in-depth interviews were also conducted with eleven of the twelve enforcement teams, both during and within several months of the time that the surveys were administered. Each interview included one superior (i.e., at the level of deputy team leader) and, in most instances, 2–3 additional team members. The interviews were semi-structured and covered seven aspects of regulatory control: major tasks of enforcement, regulatory strategies, enforcement difficulties, notable experiences, sources of influence/pressure, areas for improvement, and key stakeholder expectations. Overall, our strategy was to use the interview data primarily to validate the surveys and to assist us in the interpretation of our findings.

3.2. Measures

Three variables were included as controls: 1) The respondent's gender was recorded as a dummy variable (0 = males; 1 = females); 2) Age was recorded in years; and 3) The respondent's predisposition toward a set of values known as the "New Environmental Paradigm" (NEP) was measured using a 15-item scale developed by Dunlap and van Liere (1978). Cronbach's α statistic for this scale in this sample was .769.

The survey included 17 items that spoke to various obstacles to enforcement—nine within the agency and eight questions related to the support of local government for regulatory enforcement. These items were factor analyzed using PAF extraction and varimax rotation. Four factors with eigenvalues greater than unity were extracted that accounted for 64% of the variation among the items and provided a relatively simple structure. One factor included all of the local government support items; the other three were associated with agency obstacles. The items and factor loadings are given in Table 1. In addition, the wording for these items is given in Table 2, along with the response scales and their descriptive statistics. These items were then combined to form four scales.

Local Government Support. These questions inquired about the extent to which the environmental officials perceived that various local governmental bodies were adequately supportive of their

Table 1
Factor analysis of obstacles to enforcement.^a

Items	Factor			
	1	2	3	4
1) Insufficient resources	-.145	.068	.635	.124
2) Insufficient technical training and knowledge	-.072	.063	.607	.259
3) Inadequate administrative authority	-.162	.081	.580	.075
4) Poor communication and mutual understanding	-.060	.208	.238	.800
5) Poor interdepartmental coordination	-.057	.226	.259	.875
6) Ambiguous instructions and regulations	-.117	.516	.303	.171
7) Too many instructions and regulations	-.082	.761	-.028	.064
8) Conflicting instructions and regulations	-.089	.621	.037	.210
9) Instructions and regulations do not fit environment and needs in reality	-.158	.527	.452	.005
10) Provincial Government (Guangdong)	.817	-.110	-.213	-.039
11) Municipal Government (Guangzhou)	.907	-.125	-.170	.028
12) City Mayor (Guangzhou)	.836	-.093	-.112	.000
13) Local government offices (Guangzhou)	.800	-.011	-.068	-.142
14) Party Committee (Guangzhou)	.929	-.128	-.115	.006
15) Peoples' Congress of (Guangzhou)	.939	-.129	-.071	-.017
16) Consultative Committee of Guangzhou	.901	-.072	-.109	-.085
17) Local Courts	.669	-.079	-.123	-.063

^a Principal axis factoring; varimax rotation.

Table 2
Sample demographics and scale items.

Item	Mean	s.d.
<i>Demographic variables</i>		
Gender (0 = male; 1 = female)	.33	.47
Age (in years)	37.52	7.86
Educational attainment (1 = junior secondary; 2 = senior secondary; 3 = university; 4 = postgraduate)	2.85	.55
<i>New Environmental Paradigm</i> [5-point Likert scale (1, strongly disagree...5, strongly agree); $\alpha = .769$]	3.65	.432
Indicate how strongly you agree or disagree with the following statements		
We are approaching the limit for the number of people the earth can support	4.01	.728
Humans have the right to modify the natural environment to suit their needs ^a	2.75	1.079
When humans interfere with nature it often produces disastrous consequences	4.31	.589
Human ingenuity will ensure that we do NOT make the earth unlivable ^a	3.26	.906
Humans are severely abusing the environment	4.08	.813
The earth has plenty of natural resources if we just learn how to develop them ^a	3.12	1.112
Plants and animals have as much right as humans to exist	4.07	.740
The balance of nature is strong enough to cope with the impact of modern industrial nations ^a	2.08	.997
Despite our special abilities, humans are still subject to the laws of nature	3.95	.891
The so-called "ecological crisis" facing humankind has been greatly exaggerated ^a	2.40	.910
The earth is like a spaceship with only limited room and resources	3.90	.810
Humans were meant to rule over the rest of nature ^a	2.25	.975
The balance of nature is very delicate and easily upset	3.84	.852
Human will eventually learn enough about how nature works to be able to control it ^a	3.05	1.005
If things continue on their present course, we will soon experience a major ecological catastrophe	3.46	.857
<i>Local government support for enforcement</i> [5-point Likert scale (1, strongly disagree...5, strongly agree); $\alpha = .959$]	3.50	.707
Have the following units/departments provided you with adequate support for regulatory enforcement?		
Provincial Government (Guangdong)	3.51	.814
Municipal Government (Guangzhou)	3.52	.838
City Mayor (Guangzhou)	3.46	.831
Local government offices within the city	3.52	.796
Party Committee (Guangzhou)	3.51	.830
Peoples' Congress (Guangzhou)	3.51	.797
Consultative Committee (Guangzhou)	3.50	.738
Local Courts	3.45	.821
<i>Agency obstacles to regulatory enforcement</i> [5-point Likert scale (1, strongly disagree...5, strongly agree)]		
Do you agree or disagree that your organization has the following major problems?		
<i>Insufficient resources</i> ($\alpha = .662$)		
Insufficient resources	3.66	.580
Insufficient technical training and knowledge	3.84	.820
Inadequate administrative authority	3.33	1.004
<i>Poor coordination</i> ($\alpha = .894$)		
Poor communication and mutual understanding	3.83	.892
Poor interdepartmental coordination	2.99	.917
<i>Job ambiguity</i> ($\alpha = .742$)		
Ambiguous instructions and regulations	3.01	.990
Too many instructions and regulations	2.97	.939
Conflicting instructions and regulations	3.03	.727
Instructions and regulations do not fit the working environment and needs in reality	3.01	1.010
<i>Perceived enforcement difficulty</i> [5-point Likert scale (1, strongly disagree...5, strongly agree); $\alpha = .799$]		
Given various constraints, it is difficult for me to....		
Enforce fully most environmental regulations, rules and standards	2.79	1.004
Monitor all pollution enterprises under my jurisdiction	3.05	.913
Make polluting enterprises comply with environmental regulations, rules and standards	3.29	.998
Enforce fully most environmental regulations, rules and standards	2.84	.902
Monitor all pollution enterprises under my jurisdiction	2.91	.916
Make polluting enterprises comply with environmental regulations, rules and standards	2.59	.825

Table 2 (continued)

Item	Mean	s.d.
Make polluting enterprises actively reduce their pollution levels	2.70	.822
Make the public satisfied with our pollution control efforts	2.90	.912
Establish good working relations with the regulated enterprises	2.32	.687

^a Item reflected prior to forming scale.

efforts to implement laws and regulations. Thus, respondents were provided with a list of relevant local government bodies (e.g., City Mayor's office, Local Party Committee) and were asked to rate the adequacy of each body's support for regulatory enforcement. All items were measured on a 5-point Likert scale. This scale appeared to be internally consistent ($\alpha = .959$). This high level of internal consistency would indicate the respondents either didn't discriminate differences in support from various local government departments or that, in fact, that such support is highly consistent. Even in the event that our respondents provided a general sense of how much local government supported their work, we would contend that they should be good informants as they undoubtedly have a keen interest in news, sharing anecdotes and the views of more senior officials. In addition, more objective measures of local government support would have been either submerged in inter-departmental politics (e.g., especially actions taken to undermine regulatory enforcement) or confounded with internal agencies to enforcement (e.g., local government budgets for environmental protection).

Agency Obstacles to Enforcement. 1) *Insufficient resources*. Three items concerned whether or not the enforcement official perceived that there were insufficient resources, technical training and knowledge, and administrative authority to do their job well ($\alpha = .662$); 2) *Poor coordination*. Two items addressed insufficient communications leading to mutual understanding and poor inter-departmental coordination which, when considered jointly, address lateral integration with other units in the agency ($\alpha = .894$); and 3) *Job ambiguity*. Four items enquired about whether or not instructions and regulations were ambiguous, too numerous, conflicting, or did not fit the working environment ($\alpha = .742$).

Perceptions of Enforcement Difficulty. Respondents were asked a series of seven questions pertaining to how difficult they perceived it was for them to attain certain goals and implement specific regulations while, at the same time, appeasing the public and maintaining good working relations with the regulated enterprises ($\alpha = .799$).

Enforcement Actions. The actions an enforcement official may take vis-à-vis the regulated were self-reported as three distinct

variables: 1) *Inspections*—the average number of enterprises visited per week for the purpose of assessing adherence to regulatory requirements. Inspections are important in that they are the primary means for identifying regulatory violations; 2) *Violations*—the average number of deviations from regulatory requirements processed by the enforcement official per month; and 3) *Fines*—the average number of fine notices issued per month. An examination of these three measures indicated that they were all substantially skewed (ranging from +2.13 for inspections per week to +5.14 for fines per month). As a result, we took the natural logarithm of each variable, which resulted in distributions more amenable to the assumptions underlying structural equation modeling.

As a final step, interaction terms were created between the measure of local government support and each of the three internal agency obstacles. Each variable was centered prior to creating the interaction term, as suggested by Aiken and West (1991), in order to minimize potential problems associated with multicollinearity. The data were subsequently analyzed using SPSS for the descriptive statistics and AMOS, a structural equation modeling program, to obtain maximum likelihood estimates of the parameters for the purpose of hypothesis testing as indicated in Fig. 1.

4. Results

Pearson correlations among the items and scales are reported in Table 3. As is evident in this table, most correlations are fairly low, with the strongest being in the .30–.40 range. Two of these involve the NEP scale, which is negatively correlated with the respondents' perceptions of local government support ($r_{xy} = -.370$), but positively correlated with perceptions of insufficient resources ($r_{xy} = .396$). In addition, job ambiguity and perceptions of enforcement difficulty are positively correlated in this range ($r_{xy} = .347$). All the remaining correlations in this magnitude are among similar measures—three among agency obstacles ($r_{xy} = .322$ –.389) and one involving enforcement actions (i.e., frequency of handling violations and issuing fines— $r_{xy} = .339$).

The estimates for the structural model are reported in Table 4. The R^2 s of the four dependent (endogenous) variables range from 15.7% for violations per month to 26.9% for fines levied per month. As a group, the control variables have little observable effects on any of the dependent variables, as only gender is weakly significant twice at the .10 confidence level—these two coefficients suggesting that females report somewhat less difficulty in enforcement and also (possibly as a consequence) doing more inspections on average each week. The absence of significance for the other control variables here is surprising in that each was included with the intention of controlling for extraneous influences on the dependent variables, which were deemed likely, *a priori*. It seems rather surprising, for

Table 3

Pearson correlations of demographics, Indices of local government support and agency obstacle, and enforcement actions.

	1	2	3	4	5	6	7	8	9	10	11
1) Gender											
2) Age	-.017										
3) Education	.043	-.237**									
4) NEP	.059	-.152	.192*								
5) Local government support	-.105	.124	-.299**	-.370**							
6) Poor coordination	-.017	.079	-.031	.175*	-.130						
7) Insufficient resources	-.154	.056	.129	.396**	-.282**	.389**					
8) Job ambiguity	-.037	-.079	.049	.190*	-.275**	.380**	.322**				
9) Difficulty enforcing	-.175*	.001	-.002	.251**	-.216**	.209*	.391**	.347**			
10) Inspections per week (ln)	.279**	-.072	.205*	-.005	-.247**	-.076	-.008	-.017	-.233*		
11) Violations handled per month (ln)	.141	-.079	.100	.239*	-.218*	-.143	.058	.067	.085	.237*	
12) Fines per month (ln)	.160	-.158	.061	.143	-.209	-.135	-.029	.023	.123	.048	.339**

* $p < .05$, and ** $p < .01$.

Table 4
Regression models predicting the number of inspections, violations handled and fines levied.^a

	Difficulty enforcing			Inspections/week (Ln)			Violations handled/month (Ln)			Fines levied/month (Ln)		
	β	s.e.	Sig.	β	s.e.	Sig.	β	s.e.	Sig.	β	s.e.	Sig.
<i>Control variables</i>												
Gender	-.198	.107	*	.277	.148	*	.405	.308		.556	.473	
Age	.002	.007		-.003	.009		.000	.020		-.030	.030	
Educational attainment	-.049	.097		.197	.133		.085	.277		.002	.426	
NEP	.151	.125		-.174	.179		.507	.371		.174	.570	
<i>Main effects</i>												
Local government support for enforcement	-.067	.074		-.299	.106	***	-.168	.220		-.158	.338	
Poor coordination	.003	.056		-.086	.080		-.335	.165	**	-.297	.254	
Insufficient resources	.208	.080	**	.126	.116		-.121	.240		-.449	.369	
Job ambiguity	.206	.073	**	.021	.107		.255	.221		.324	.339	
Difficulty enforcing	–	–		-.330	.117	**	.202	.243		.665	.373	*
<i>Interactions</i>												
Govt. \times Poor coordination	-.040	.081		-.057	.115		-.074	.239		-.892	.368	**
Govt. \times Insufficient resources	.000	.103		.245	.151		-.186	.303		.019	.467	
Govt. \times Job ambiguity	.050	.077		.115	.110		.345	.228		1.266	.351	***
<i>Model information</i>												
R ²	24.7%			22.3%			15.7%			26.9%		

* $p < .10$, ** $p < .05$, *** $p < .01$.

^a Unstandardized coefficients.

example, that environmental values (i.e., the NEP scale) should not translate into more rigorous enforcement. Either these findings point to measurement problems with the scale or they may suggest that the incidence of enforcement actions is less of an individual prerogative than might be assumed.

Six main effects are significant at the .10 confidence level or better. Among those that are *not* significant is the coefficient for local government support predicting perceptions of difficulty in enforcement. This is at odds with our expectations given the strong emphasis in the literature on how critical local government support is for regulatory enforcement in China. This provides no support for the first hypothesis.

The second hypothesis, which posited that local government support would increase the frequency of enforcement actions, is also *not* supported. Indeed, the coefficient predicting the rate of inspections is highly significant ($p < .01$) and *negative* ($\beta = -.299$). In effect, what this seems to be suggesting is that increases in local government support for enforcement actually *decrease* inspection rates. On its face, this finding—in tandem with that for the first hypothesis—would appear to call into question much of the literature, which has uniformly emphasized the role of local government support in facilitating regulatory enforcement. Consequently, we will dwell on the implications of this finding at length in the discussion section.

The third hypothesis predicted positive relationships between agency obstacles and perceptions of enforcement difficulty. Two coefficients appear to significantly explain variation in perceptions of enforcement difficulty, as both insufficient resources ($\beta = .208$) and job ambiguity ($\beta = .206$) have significant coefficients. Such relationships are not surprising, in that both resources and clarity are important preconditions for effective regulatory enforcement. This was mentioned repeatedly in our interviews. Indeed, comments pertaining to inadequate resources and job ambiguity were most commonly mentioned among the written comments we received (29 of 33) as being the major obstacles to effective regulatory enforcement. What is much more interesting is that poor coordination appears to have little, if any, effect. It certainly seems possible—at least from the perspective of an enforcement official—that coordination implies a measure of additional effort that could attenuate its benefits in their eyes. In fact, poor coordination was seldom mentioned in the written comments (3 of 33). Taken altogether, two of three possible significant relationships

involving internal obstacles provide a measure of support for our third hypothesis.

The fourth hypothesis, which predicted that internal obstacles to enforcement would decrease the frequency of enforcement actions, receives somewhat meager support in that a single coefficient is significant. Poor coordination appears to reduce the number of violations handled per month ($\beta = -.335$). This is as hypothesized, although in light of the numerous internal agency obstacles that seem to have little or no direct effect on violations processed, one might pause momentarily to consider why poor coordination should stand out in any way. If we build off the possibility mentioned earlier that enforcement officials may have less individual discretion than might be assumed (i.e., based on very weak effects related to the control variables), enforcement officials (and their superiors) quite possibly need frequent signals regarding the advisability of issuing citations in order to be generally in line with what other units in the agency are doing and, therefore, use communication and coordination for reference points. It may also be that coordination simply improves the efficiency (and therefore the desirability) of reporting violations. Once again, because the derivation of this overall hypothesis was straightforward, it is the extent of “non-findings” that leaves the far greater impression here.

The final significant main effects are from perceptions of enforcement difficulty on the rate of inspections ($\beta = -.330$) and, less significantly, on fines levied ($\beta = .665$). The interpretation of the former would appear to be simply that difficulty in enforcement translates into less capacity (time) for enforcement in terms of inspections which would lend some support for our fifth hypothesis. The second significant effect is far more challenging to explain, in that perceptions of difficulty in enforcement appear to translate into a higher rate of fines which in turn would appear to seriously erode such support. Perhaps, when enforcement is particularly challenging, officials may resort to legalistic or coercive approaches by imposing heavier fines. Whether this is driven by a need for resources (as fines are a source of revenue) or a reaction to frustration is difficult to know. In some interviews, respondents did note having to conduct surprise inspections at night when dealing with certain enterprises (i.e., who released pollutants under the cover of night or who had a system in place to be notified of approaching inspectors). Perhaps fines are more likely to be levied in such cases due to the greater costs involved or by way of retaliation.

Another possibility for both of these findings would be associated with reverse causality. In other words, it is certainly conceivable that frustration related to a diminished capacity to conduct inspections and/or the unpleasantness of issuing fines creates heightened perceptions of enforcement difficulty. As our quantitative data is cross-sectional, causal direction cannot be established. In sum, however, these provide mixed and conflicting support for our fifth hypothesis.

Our sixth and seventh hypothesis spoke to a likelihood of joint (i.e., interaction) effects involving the levels of local government support and internal agency obstacles and their relationship to perceptions of enforcement difficulty and enforcement actions, respectively. The sixth hypothesis received no support whereas the seventh was partially supported as two significant interaction effects are observed related to the frequency of fines. In order to interpret these interactions, each has been plotted and is presented in Fig. 2 as Plots 1–2.

The first plot shows the interaction of local government support with coordination within the bureau. Here it can be observed that relatively high rates of fines occur when local government support is low and coordination within the agency is poor (predicted value = 1.21). If one assumes that support promotes interest (and quite possibly some meddling of local government bodies in agency affairs) when coordination is poor and local government interest is low, the enforcement officials may be relatively free to get on with

their jobs as they see fit. This would seem to be reinforced by the enforcement officials' responses to a question in the survey which asked them what they considered to be "the most important mission of your enforcement duty?", to which they were asked to rank six items in order of importance. Of these, the highest rated was "strict enforcement of environmental rules and regulations", and second was "reducing pollution". Sufficient autonomy of enforcement officials therefore seems likely to lead to fairly high frequency of fines.

The other combination in this plot associated with a higher frequency of fines is when local government support is seen as high and coordination adequate (predicted value = 1.12). In other words, with high levels of local government support, the agency probably needs coordination under two different scenarios. One would be to establish a coherent stakeholder strategy to sort out the assorted preferences and priorities emanating from different local government bodies in order to present a reasonably common front.

The second plot shows a pattern associated with the interaction of local government support for regulatory enforcement, but this time with job ambiguity. In this plot, we see that when there is low job ambiguity (i.e., a condition of clarity) and local government support is low, the number of fines levied per month is relatively high (predicted value = 1.38). If we continue to assume, as we have previously, that low levels of government support are something more akin to benign neglect (i.e., as opposed to more aggressive efforts to actually undermine the work of the enforcement official), then the official would be able to issue fines relatively freely and unencumbered. The high incidences of fines in the presence of high levels of local government support and job ambiguity are more difficult to account for, but interview comments suggest that local government support isn't always welcome by enforcement officials. Indeed, one fairly strong theme in the interviews was that local government support often led to complaints being referred through those bodies along with a request for "quick action". As a regular occurrence from different offices, such requests could easily promote ambiguous, conflicting or even irrelevant direction, leaving enforcement officials simply having to muddle through as best they can and presuming that the issuance of a fine is irrefutable evidence of responsiveness.

5. Discussion

As pointed out in the introduction to this study, China faces either a current or a looming environmental crisis, depending upon one's particular threshold for environmental degradation. In spite of many well-intentioned environmental regulations, most scholars and practitioners acknowledge that the problem is inherently one of ineffectiveness of regulatory enforcement. Accordingly, this study set out to determine what factors most account for this "enforcement gap". Given its prominence in the literature and insights from Matland's (1995) framework, we focused on the role of local government support and internal obstacles associated with poor coordination, job ambiguity and resource insufficiency.

For the dependent variables in our model, we used one broad perceptual measure related to difficulties in enforcement and three more measures associated with specific enforcement outcomes: the rate of inspections, the number of violations processed and the number of fines levied against violators. We also examined the relationship of how agency obstacles to enforcement and the support of local government officials influence enforcement actions—both directly and indirectly through perceptions of difficulty of enforcement and via interaction effects (as depicted in Fig. 1).

This study found that two internal agency obstacles were significant factors in influencing perceptions of difficulty in enforcement. Both of these findings are fairly straightforward and consistent with conventional understanding. First, insufficient

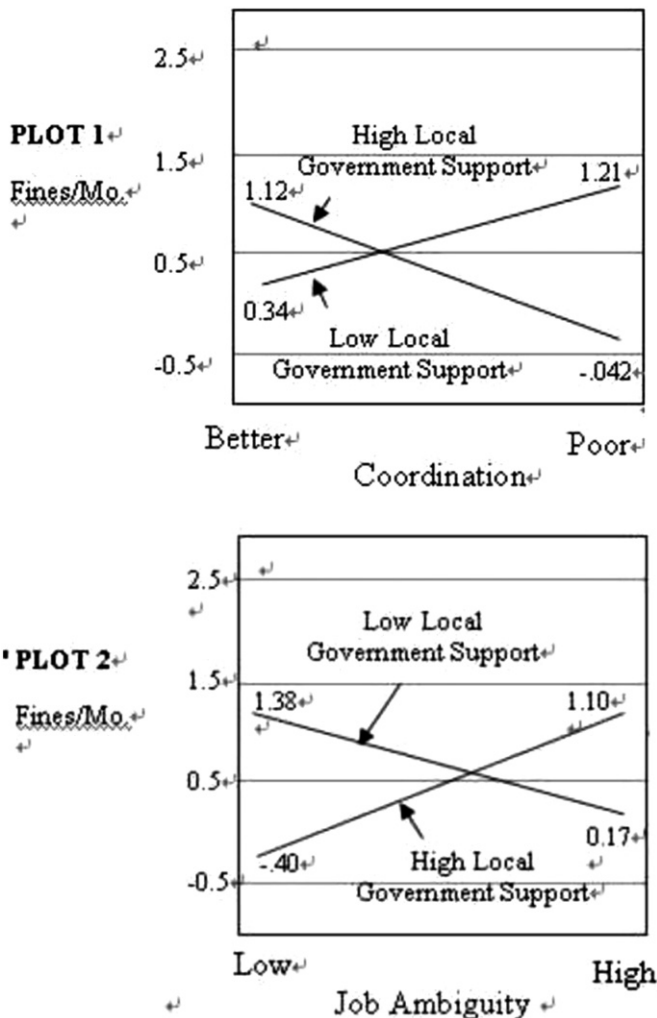


Fig. 2. Interaction plots of local government support with agency obstacles.

resources within the agency promote perceptions of difficulty; second, job ambiguity also increases perceptions of difficulty. While one should not normally dwell on non-findings, neither poor coordination within the bureau nor local government support for enforcement have significant direct effects on enforcement officials' perceptions of difficulty in enforcement. The latter instance of nonsignificance warrants some comment because it essentially says that from the perspective of the environmental enforcement official, the presence or absence of local government support does not matter much in terms of their ability to do their job. Indeed, many interviewees indicated that local government intrusions nearly always disrupted their working schedule and were often unwelcome distractions.

For the more specific enforcement actions—frequency of inspections conducted, violations processed, and fines levied—with one notable exception we again see much less influence of local government support than we anticipated, as there are no significant direct effects on either the rate of violations handled or fines levied. Quite likely, the most intriguing finding of this study is that local government support for enforcement has a significant *negative* effect on inspection rates. Taken all together, one might conclude from these results that instead of being essential to enforcement effectiveness, local government support is in reality relatively unimportant and possibly even somewhat disruptive. This could occur, for example, if local government support for enforcement is more about “style over substance” and in reality has little real enthusiasm for clamping down on violators. Another possibility is that local government support for enforcement is genuine; but leads to unwelcome meddling and/or diversions from actual enforcement duties (e.g., from urgent requests, additional bureaucracy or meetings). It was pointed out in our interviews, for example, that the Mayor had introduced a “hotline” through which citizens could directly lodge pollution complaints. This had, in turn, led to many requests for “urgent action”. To make matters worse, such complaints were often in response to visible pollution or noise which turned out to be within the prescribed limits. Often, it was then more time-consuming to have to explain why a violation was not issued! Finally, as mentioned earlier on, local government in China is not monolithic, such that local government support could result in inconsistent or possibly even conflicting approaches (having said this, the enforcement officials in this sample do not appear to reflect this as evidenced by the high level of internal consistency of the scale measuring this item). Any of these possibilities could render local government support for enforcement ineffective and account for a persistence of the enforcement gap in spite of it.

Alternative explanations for these findings could focus on our measures and the possibility that they poorly capture the construct of effective regulatory enforcement. Because regulatory compliance can be obtained through means other than inspections, citations and fines (e.g., rewards such as ease in obtaining permits), they only tell part of the story. This could happen, for example, if the targets of the regulations (enterprises) were to voluntarily “get on board” having realized that this is now important in order to be given favorable treatment. For example, during the period of this study the EPB was promoting the adoption of on-line monitoring programs which were meant to reduce the frequency of physical inspections. It is not inconceivable that larger enterprises or SOEs seeking to curry favor with the local government might be much more willing to adopt such systems if they felt environmental protection was becoming a bona fide priority.

Another possibility for these findings would focus on the enforcement officials themselves and argue that they are too insulated to properly evaluate the effect of local government support for enforcement and to experience and appreciate its consequences. As a result, the impact is grossly understated. While

it is probably true that the respondents in this study were not privy to the inner workings of local government and the more nuanced influences by which its support for regulatory enforcement would be exercised, it seems unlikely that they would not be in a position to generally and quite accurately know the “party line” and also to gauge the overall climate of support. As far as the frequencies of enforcement actions, one would be challenged to find a better source of information short of obtaining the data directly from EPB records.

Having found these alternative explanations lacking, we are somewhat uncomfortably left with the conclusion that local government support for the enforcement of environmental regulations is probably unlikely, at least in itself, to close the enforcement gap. In arriving at this point, however, it seems likely that the story is far more complex than this would suggest. For one thing, it is quite possible that these relationships may not be linear. As one progresses from obstruction through indifference to different levels of support, would the relationships to enforcement actions stay the same? It certainly seems possible that there could be thresholds at either extreme where the influence of local government could “break through” to really matter. It also seems likely that the form and substance of support may be quite varied. For example, we have already hinted at the prospect of various government bodies perhaps agreeing about the goal of regulatory enforcement, but disagreeing about the means to that end, and of course verbal support generally needs to be matched with tangible support. Indeed, in the interviews, a common complaint was that resources were not increased in proportion to extra duties. Contrast this situation with that where a charismatic leader unites local government behind a clear strategy and then matches that support with essential resources. In the former case, local government support could be dissipated; in the latter case, enforcement activities could be significantly energized. Finally, as previously mentioned, local government support may be well intentioned but misguided. In interviews, leaders of enforcement teams mentioned that local government prioritization of pollution resulted in their being put “on call” at all hours, and when called, required to appear on site for what they often saw to be trivial incidents or accidents. Overall, these findings indicate a move away from political processes toward administrative processes as was drawn from Matland's (1995) framework. However it is necessary to qualify that the transition is still under way, as supportive efforts for stricter regulatory control from other bureaucratic agencies have not been comfortably secured and the perception of inadequate enforcement power of the Guangzhou Environmental Protection Bureau is quite widely shared among enforcement officials.

This study further found that internal agency obstacles also have an effect on enforcement actions. Poor coordination, in particular, appears to have a negative effect on the frequency of violations handled per month. In addition, insufficient resources and job ambiguity may also weakly affect the number of inspections, but indirectly through perceptions that enforcement is difficult (i.e., by increasing it, which in turn decreases the rate of inspections).

Finally, this study also found evidence that external and internal obstacles to enforcement interact in influencing the rate at which fines are levied. Overall, this again points to a more complex role of local government support for regulatory enforcement than prevails in the literature, and again our interpretation of the interaction plots did not tend to portray a uniformly favorable image. Indeed, our speculations convey the impression of enforcement officials who simply want to get on with their jobs somewhat absent of outside interference, and who consider local government support for enforcement to be a mixed blessing at best.

A few limitations of this study warrant mention. One fairly obvious one is that it relies on self-reported measures of

enforcement effectiveness, which may have been subject to certain biases. Another limitation is that this study looks at enforcement style in a single Chinese city—Guangzhou, which has severely restricted our ability to generalize our findings. A final limitation is that this study focused only on local government support (or lack thereof) as the only major external source of support for environmental regulatory enforcement, whereas more scholars are contending that local communities, whether helped by civil society organizations or not, can positively influence pollution enforcement (Ho, 2001; Yang, 2005; Ho and Edmonds, 2007).

6. Conclusion

This study sought to make a contribution to the literature regarding the persistence of the enforcement gap in China by investigating the relationship between one often-mentioned impediment to regulatory enforcement in China—an insufficiency of local government support for environmental regulation—and several internal agency obstacles to enforcement. By including these in the same study, we were also in a position to examine more complex interaction effects. In addition to combining survey and interview data, we included both a broad perceptual measure of enforcement effectiveness and three more specific enforcement actions usually associated with formalistic or strict enforcement.

Overall, our findings raise important questions about some commonly-held assumptions about regulatory enforcement in China. First, our findings certainly call into question relatively simplistic views regarding the role of local government support for environmental regulatory enforcement in China, as it was found to be relatively inert with the exception of having a negative effect on inspection rates. Consequently, the role of local government is likely much more complex and nuanced than usually assumed. It would certainly not appear to be the case that in order to close the enforcement gap, China simply needs more of it. It is certainly possible that the relationship of local government support for enforcement to enforcement effectiveness is not linear, and that there are thresholds beyond which it matters, but within which it doesn't. Even then the ability of local government to close the enforcement gap probably depends on the quality of support. Clearly, support needs to go well beyond verbiage, but even then strong local support for enforcement could be ineffectual in the event of bickering and in-fighting about the means.

Hopefully, this study will stimulate further discussion and additional research that can shed more light on these issues. Given the degradation of the environment within China, regional issues such as acid rain and marine pollution, and the global implications related to climate change, it is imperative to identify, better understand and then overcome obstacles to environmental regulatory enforcement. The scale and urgency of these challenges further underscore the critical importance of this research.

Acknowledgement

The research for this paper is partially funded by the project "Effects of E-Government on Citizen's Trust in Government in China: The Guangzhou Experience" of the Departmental General Research Fund of the Department of Management and Marketing at

The Hong Kong Polytechnic University (Project Account Code: 4-ZZ72), and the grants from the Natural Science Foundation of China (No. 70971081, 71271102) and the Fundamental Research Funds for the Central Universities (No. 12JNYH005). The authors would like to thank the two anonymous reviewers for their constructive comments on earlier versions of the paper.

References

- Aiken, L.S., West, S.G., 1991. *Multiple Regression: Testing and Interpreting Interactions*. Sage, Thousand Oaks, California.
- Bachner, B., 1996. Regulating pollution in the People's Republic of China: an analysis of the enforcement of environmental law. *Colorado Journal of International Law and Policy* 7, 373–408.
- Chan, H.S., 1995. The implementation gap in environmental management in China, the case of Guangzhou, Zhengzhou, and Nanjing. *Public Administration Review* 55, 333–340.
- Dunlap, R.E., van Liere, K.D., 1978. The 'new environmental paradigm'. *Journal of Environmental Education* 9, 10–19.
- Economy, E., 2004. *The River Runs Black: the Environmental Challenge to China's Future*. Cornell University Press, Ithaca.
- Ho, P., 2001. Greening without conflict? Environmentalism, NGOs and civil society in China. *Development and Change* 32, 893–921.
- Ho, P., Edmonds, R.L., 2007. Perspectives of time and change: rethinking embedded environmental activism in China. *China Information* 21, 331–344.
- Jahiel, A.R., 1997. The contradictory impact of reform and environmental protection. *The China Quarterly* 149, 81–103.
- Jahiel, A.R., 1998. The organization of environmental protection in China. *The China Quarterly* 156, 757–787.
- Lo, C.W.H., Tang, S.Y., 2006. Institutional reform, economic changes, and local environmental management in China: the case of Guangdong Province. *Environmental Politics* 15 (2), 190–210.
- Lo, C.W.H., Fryxell, G.E., 2003. Environmental styles among environmental officials in China. *Journal of Public Policy* 23 (1), 81–115.
- Lo, C.W.H., Fryxell, G.E., 2005. Governmental and societal support for environmental enforcement in China: an empirical study in Guangzhou. *The Journal of Development Studies* 41, 558–589.
- Lo, C.W.H., Fryxell, G.E., Wong, W.W.H., 2006. Effective environmental regulation with little effect: the antecedent of the perceptions of environment officials on enforcement effectiveness in China. *Environmental Management* 39 (3), 388–410.
- Ma, X.Y., Ortolano, L., 2000. *Environmental Regulation in China: Institutions, Enforcement, and Compliance*. Rowan & Littlefield Publishers, N.Y.
- Matland, R., 1995. Selections from synthesizing the implementation literature: the ambiguity-conflict model of policy implementation. *Journal of Public Administration Research and Theory* 5 (2), 145–155.
- Mertha, A.C., 2005. China's 'Soft' centralization: shifting *Tiao/Kuai* authority relations. *The China Quarterly* 184, 791–810.
- Sinkule, B., Ortolano, L., 1995. *Implementing Environmental Policy in China*. Praeger, London.
- Swanson, K.E., Kuhn, R.G., Wei, Xu, 2001. Environmental policy implementation in rural China: a case study of Yuhang, Zhejiang. *Environmental Management* 27, 481–491.
- Tang, S.Y., Lo, C.W.H., Cheung, K.C., Lo, J.M.K., 1997. Institutional constraints on environmental management in Urban China: implementing environmental impact assessment in Guangzhou and Shanghai. *The China Quarterly* 152, 863–874.
- Tilt, B., 2007. The political ecology of pollution enforcement in China: a case of Sichuan's rural industrial sector. *China Quarterly* 192, 915–933.
- Van Rooij, B., 2002. Implementing Chinese environmental law through enforcement: the *Shiwu Xiao* and *Shuangge Dabiao* campaigns. In: Chen, J., Li, Y., Otto, J.M. (Eds.), *The Implementation of Law in the People's Republic of China*. Kluwer Law International, The Hague, pp. 149–178.
- Van Rooij, B., 2003. Environmental law enforcement in Sichuan: organization and procedure in comparative perspective. *China Information* 17, 36–65.
- Van Rooij, B., 2006. *Regulating Land and Pollution in China, Lawmaking, Compliance, and Enforcement; Theory and Cases*. Leiden University Press, Leiden.
- Van Rooij, B., Lo, C.W.H., 2010. A fragile convergence: understanding variation in the enforcement of China's industrial pollution law. *Law and Policy* 32, 14–37.
- Yang, G., 2005. Environmental NGOs and institutional dynamics in China. *China Quarterly* 181, 46–66.