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How Does Enforcement Deter Gray Market Incidence?

Gray market activity has become increasingly prevalent. The prevailing wisdom in marketing is to use more severe enforcement to deter gray marketing. However, the certainty and speed of enforcement may also have a bearing on the incidence of violations. This article examines whether and how enforcement deters gray marketing. The results from a field survey of manufacturers and an experimental design suggest that, by itself, enforcement severity has no impact. Deterrence results only when the multiple facets of enforcement are used in combination.

In today's competitive markets, manufacturers increasingly rely on their authorized distributors to perform value-adding functions (Coughlan et al. 2001). To safeguard distributor incentives to perform these services, manufacturers typically deploy resale restrictions through explicit contracts or implicit agreements. By circumscribing to whom distributors may sell, resale restrictions limit intrabrand competition and maintain distributor margins. Gray market activity—that is, the sale of genuine trademarked products through distribution channels unauthorized by the manufacturer or brand owner—poses a direct and significant threat to manufacturers' deployed resale restrictions. Given free reign, gray markets create free-riding problems across distributors that provide customer service, make a selective distribution system more intensive, and harm distributors that have made specific investments in the channel of distribution. Gray marketing is problematic for manufacturers because it can have a negative impact on distributor relations and the manufacturer's brand equity, ultimately undermining the integrity of the distribution channel (Corey, Cespedes, and Rangan 1989; Myers and Griffith 1999).

Gray markets are endemic across, though not limited to, a wide variety of industries, ranging from heavy construction equipment, personal computers, and cellular phones to perfumes, watches, personal care, and other consumer products. Estimates of gray market activity range from $10 billion in economy-wide annual gray market sales (Cespedes, Corey, and Rangan 1988) to $20 billion in the information technology sector alone (estimate by the Alliance for Gray Market and Counterfeit Abatement; see www.agmaglobal.org). Surveys conducted by Michael (1998) and Myers (1999) confirm the increasing incidence and scope of gray market activity.

Most firms are keenly aware of the costs of allowing gray market activity to go unchecked (Bucklin 1993; Hwang 1999; Nelson 1999) and allocate significant resources to limiting the incidence of violations. In general, the prevailing advice from the academic literature is that increasing enforcement severity (i.e., raising the magnitude of the punitive response undertaken) lowers the incidence of gray market activity. For example, the enforcement literature in marketing (Banerji 1990; Dutta, Bergen, and John 1994) exclusively focuses on severity as the dimension of enforcement that firms should manage. Such a focus reflects the implicit assumption that the critical management variable for manufacturers seeking effective gray market deterrence is "the severity of the principal's disciplinary response to an agent's violation of a contractual obligation" (Antia and Frazier 2001, p. 67).

Although such advice may seem intuitively appealing and finds favor with those urging manufacturers to "get down to business" against gray market activity (Nelson 1999), to the best of our knowledge, there is no evidence of the efficacy of severe enforcement in the context of gray markets. A well-established literature spanning economics, law, sociology, and social psychology, which has come to be known as the deterrence doctrine, proposes that severe enforcement alone may not be enough to curb the incidence of violations. Instead, the doctrine advocates a broader notion of enforcement, comprising (in addition to severity) the certainty and speed of the response (Howe and Brandau 1988; Manson 2001; Posner 1985).

Understanding how these dimensions of enforcement work together is essential to managing gray market incidence more effectively. Yet to the best of our knowledge, no attempt has been made to incorporate the possible role of severity, certainty, and speed of enforcement together in curbing gray market incidence; severity remains the sole

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focus of any discussion of enforcement, both in the trade press (Hwang 1999; Nelson 1999) and in the relevant marketing literature (Antia and Frazier 2001; Bergen, Heide, and Dutta 1998). Accordingly, current enforcement-related advice to managers is limited.

In this article, we attempt to broaden our conceptualization of enforcement and explore the incidence of gray market violations as a function of the severity, certainty, and speed of the manufacturer's general enforcement behavior. In the interests of appropriate model specification, we also incorporate several context-specific determinants of incidence gained from multiple in-depth interviews and a review of the rich literature on gray markets (Ahmadi and Yang 2000; Cavusgil and Sikora 1988; Corey, Cespedes, and Rangan 1989; Coughlan and Soberman 1998).

We first test our hypotheses with data collected from a field survey of 104 manufacturers in the personal care products industry. The difficulty of obtaining such data is well acknowledged, given the sensitive nature of the phenomenon and its implications (Cavusgil and Sikora 1988; Myers 1999). Ours is the first study to bring evidence to bear on the relationship between enforcement and gray market incidence. We then complement the insights gained from the field study with an experiment that we designed to (1) provide the perspective of the target rather than the source of enforcement and (2) manipulate the facets of enforcement in a controlled setting. Together, both studies yield rich insights into the impact of enforcement on deterrence.

In the sections that follow, we introduce the deterrence doctrine as the lens through which we view the relationship between gray market incidence and enforcement. We then discuss hypotheses that link gray market incidence to the three facets of enforcement. We follow this with descriptions of the research method and a discussion of the results and implications of our studies. We conclude with the limitations of our study and provide avenues for further research.

Conceptual Framework

Gray Market Incidence, Enforcement, and the Deterrence Doctrine

The notion of deterrence has its roots in the seminal works of Bentham (1962) and Beccaria (1963) and refers to the preventive effect of actual or threatened punishment on potential offenders (Ball 1955). In the current context, the aim of deterrence is to minimize or preclude violations of deployed resale restrictions not only by the perpetrator but also by other potential offenders. Thus, we relate the incidence of gray market violations to the manufacturer's enforcement behavior in general rather than the punitive response to a particular violation (cf. Antia and Frazier 2001; Bergen, Heide, and Dutta 1998).

Within a gray market context, enforcement refers to the means by which the manufacturer ensures distributor compliance with resale restrictions, including fines, litigation, social ostracism, and termination. The manufacturer's ability to enforce stems from the legitimate authority bestowed by explicit or implicit agreements with its intermediaries (see French and Raven 1959), but this is not the only way to deter gray market activities or achieve dealer compliance. In addition to enforcement, manufacturers may also withhold ongoing benefits, such as promotional discounts, advertising support, and training, from noncompliant downstream intermediaries. Such influence attempts are related to, though distinct from, enforcement as we define it.

Severity is fundamental to the notion of enforcement and can be defined as the strength or intensity of corrective actions across detected violations (Gibbs 1975). The costs imposed on the violating party are a direct function of the severity of the punishment that is received. The magnitude of a fine affects the offending distributor's net payoff from a gray market violation (in this case, the profit captured by the violation less the fine). Other nonfinancial costs may also be important. The costs associated with litigation and termination include the time spent in legal consultation and/or in seeking alternative sources of supply. Gray market violations are also likely to have a negative effect on the relationship between the manufacturer and the supplier, thus increasing monitoring and surveillance costs. Overall, the potential gains from violating resale restrictions are eroded by nontrivial costs, which reduces the incentive to commit the violation (Becker 1968; Stigler 1970).

The marketing literature treats enforcement and its severity as essentially synonymous. Dutta, Bergen, and John (1994) and Bergen, Heide, and Dutta (1998) conceptualize enforcement in terms of termination. Antia and Frazier (2001) explicitly define enforcement in terms of severity. Moreover, as it currently stands, the preceding literature could be characterized as advocating (even taking for granted) a single-minded focus on severity. Such a focus rests on the assumption that the rigor of enforcement has a significant inverse relationship to the incidence of violations, notwithstanding variations in certainty or speed. Thus:

> H_1: The greater the severity of enforcement, the lesser is the likelihood of gray market incidence.

Interaction with Certainty

In contrast to the single-minded focus on severity as a determinant of deterrence in the marketing literature, work in other disciplines emphasizes the need to consider enforcement certainty (the likelihood that a violator will be punished) and speed (the time taken by the manufacturer to undertake corrective action). As originally conceptualized and specified, the deterrence doctrine emphasized the facets of severity and certainty (Andenaes 1971; Bailey and Smith 1972; Bentham 1962; Gibbs 1968). Subsequent augmentations acknowledge the potential role of speed and incorporate its impact on deterrence (Gray et al. 1982). Mirroring the development path of the literature, we first focus on the potential deterrent impact of severity and certainty and then incorporate the role of speed in our hypotheses.

Research in sociology conceptualizes deterrence as a joint function of severity and certainty (Antunes and Hunt 1973; Gray and Martin 1969). The severity of enforcement is posited to have significant deterrent value but only when it is matched with a high likelihood of action being taken.

The notion of matching facets of enforcement implies the need for high levels of each facet of enforcement in order to achieve deterrence.

By certainty, we mean the manufacturer's general propensity to undertake enforcement in response to violations (Gibbs 1975). To take corrective action, the manufacturer must be able to obtain information about violations once they occur (Dutta, Heide, and Bergen 1999) and have the motivation to enforce (Antia and Frazier 2001). This is our point of departure from the deterrence doctrine, as represented in the sociology literature. In the latter case, the motivation to eradicate or at least minimize crime is a given. In contrast, manufacturers that detect gray market violations may undertake selective enforcement for a variety of reasons (Banerji 1990; Bergen, Heide, and Dutta 1998; Coughlan and Soberman 1998). In the current context, therefore, certainty of enforcement is a function of the manufacturer's ability and motivation. The former is reflected in the manufacturer's detection ability because enforcement hinges on first knowing that a violation has occurred (Antia and Frazier 2001).

Unfortunately, gray markets raise three well-known problems with regard to inferring motivation. First, in contrast to sociology, the certainty of enforcement cannot be estimated conveniently from archival information on reported crime statistics and conviction rates (Gibbs 1975), because no such information exists for gray market violations. In the absence of archival information on the incidence of violations and manufacturers' enforcement responses, it is necessary to rely on microlevel, survey-based data to gain insights into this highly sensitive issue. Second, manufacturers do not know of all instances of violations (Wathne and Heide 2000), because detection is costly (Stigler 1970) and imperfect (Dutta, Heide, and Bergen 1999). Third, and perhaps equally important, no manufacturer would admit to selective enforcement, thus introducing social desirability bias (Fisher 1993).

Recognizing this potential for bias, survey-based studies on enforcement have not solicited informant evaluations of their own likelihood of taking action. Instead, motivation is inferred from the reported enforcement response to particular instances of violations (for recent examples of this approach, see Antia and Frazier 2001; Bergen, Heide, and Dutta 1998). Moreover, previous studies have hypothesized and found evidence of a direct and strong relationship between detection ability and likelihood of enforcement (Antia and Frazier 2001; Dutta, Bergen, and John 1994; Dutta, Heide, and Bergen 1999; Ghosh and John 1999). Given the preceding difficulty and in light of the strong relationship between the two constructs, we represent certainty in terms of detection ability. Our approach is consistent with and builds on the existing marketing literature on enforcement.

The rationale for matched and high levels of severity and certainty suggests that when perpetrators decide whether to engage in gray market activities, they consider not only the previously discussed costs imposed by severe enforcement but also the likelihood of severe enforcement. If detection ability and, consequently, the certainty of an enforcement response are low, potential miscreants are likely to discount the costs imposed by severe enforcement (Luckenbill 1982). Severity poses no threat to the offender if the offence remains undetected by the manufacturer. Similar discounting of negative outcomes occurs if, for example, high detection capabilities are accompanied by less severe enforcement behavior. In this case, potential violators may reason that though the likelihood of apprehension is high (as a result of well-honed detection capabilities), their offenses are likely to incur nothing more serious than a "slap on the wrist" (Stafford et al. 1982). Proponents of this perspective argue that the credibility of sanctions hinges on both detection ability and severity (Gray et al. 1982; Hollinger and Clark 1983). The interaction perspective is also known as the "credibility of severe sanctions hypothesis" (Grasmick and McLaughlin 1978) and suggests the following:

> H_2: Severe enforcement deters gray market incidence when the certainty of enforcement is high.

The Augmented Deterrence Doctrine

Early empirical work on deterrence (Silberman 1976) focused exclusively on the certainty and severity of enforcement. Only in later studies (Gray et al. 1982) did scholars acknowledge and incorporate a third, additional dimension of enforcement: speed. The speed of enforcement refers to the time elapsed between the detection of violations and the corrective actions taken in response. Similar to severity and detection ability, our notion of speed is the time taken to respond to detected violations.

Although the relationship between enforcement speed and deterrence is not as well specified as it is for detection ability and severity, our interdisciplinary literature review yields some insights into the effects of variation in enforcement speed. First, swift (slow) corrective action reduces (increases) the length of time over which the party committing the violation may enjoy its payoff (Tedeschi 1976). Second, delay in applying sanctions allows the violating party "room to maneuver," that is, to undertake actions to avoid (or at least minimize) bearing the brunt of the costs imposed by corrective action (Hufbauer, Schott, and Elliott 1990). Third, research in psychology (Diver-Stamnes and Thomas 1995) and law (Manson 2001) suggests that temporal proximity of the violation and the consequent corrective enforcement action reinforce the punitive consequences to the perpetrator, as well as the group at large.

In contrast to the well-documented interaction between severity and detection ability, there has been little, if any, attention focused on explicating the interactions involving speed and severity (for a notable exception, see Gray et al. 1982). The logic underlying this interaction mirrors that which we proposed in H_2, that the deterrent impact of enforcement is deemed to reside in high levels of speed combined with severity. It is plausible that severe enforcement may do little to deter violations if the enforcement response is inordinately delayed. Because a slow response allows the perpetrator time to enjoy a longer payoff from the violation, gives the perpetrator room to maneuver to avoid bearing the full brunt of enforcement, and/or weakens the causal link between violation and enforcement, delayed enforcement could dampen the deterrent impact of severity. By extension, severity should have a significant effect on deterrence when both the likelihood of detection and the speed of enforcement are high. An enforcement strategy that involves high levels of all three components serves to emphasize the manufacturer's commitment to maintaining system integrity by presenting a unified, unambiguous deterrent. Thus:

> H_3: Severe enforcement deters gray market incidence when the speed of enforcement is high.
>
> H_4: Severe enforcement deters gray market incidence when both detection ability and the speed of enforcement are high.

Context-Specific Determinants of Gray Market Incidence

Scholars of deterrence agree that any examination of deterrence must account for contextual variables that have a bearing on the incidence of violations, independent of enforcement (Gibbs 1975; Meier and Johnson 1977). Our review of the academic literature on gray markets yielded five factors that emerged most frequently: price differentials, premium brand positioning, product scarcity, free-riding potential, and customer heterogeneity on services demanded.

According to Onkvisit and Shaw (1989, p. 205), "price differential is the only true reason for the gray market to exist." In attempting to price optimally for local conditions (Bucklin 1993; Duhan and Sheffet 1988), manufacturers facilitate arbitrage, whereby the diverter may source product from the low-priced market and sell it in the high-priced market without the manufacturer's authorization (Assmus and Wiese 1995). A related driver of gray market violations is the extent to which the product has a unique and differentiated brand name (Bucklin 1993). The ability to obtain a product with brand name cachet at significantly lower prices is a powerful motivator of consumer purchase (Assmus and Wiese 1995), which in turn drives the occurrence of gray marketing. Gray market violations are also likely to be high when the authorized distributors in a market are unable to satisfy demand for the product. Pent-up demand for a product creates the incentive necessary for arbitrage to occur, and goods are diverted from markets in which the product is readily available (and usually lower priced) to the markets in which the product is in short supply (Banerji 1990).

The potential for some distributors or unauthorized third parties to free ride off full-service distributors' market development efforts (Mathewson and Winter 1984; Rubin 1990; Telser 1960) also facilitates the development of a gray market (Cross, Stephan, and Benjamin 1990). Although services such as advertising, pre- and postsales service, and warranty servicing (Coughlan et al. 2001) no doubt add value to the product, the revenue streams accruing to authorized distributors from their marketing efforts are vulnerable to appropriation (Anderson and Weitz 1986). Customer heterogeneity on services also is likely to foster gray markets. Some customers may value and even require services, whereas others may not be willing to pay for perceived "frills." Enterprising diverters would be quick to provide the actual product with little or no augmentation to those unwilling to pay the high price for the "bundled" product or service offering, thus realizing incremental (albeit unauthorized) sales to an additional, hitherto ignored customer segment (Ahmadi and Yang 2000; Yang, Ahmadi, and Monroe 1998). The preceding discussion leads to the following hypothesis:

> H_5: The greater the (a) price differential, (b) premium positioning, (c) product scarcity, (d) free-riding potential, and (e) customer heterogeneity on services in a market, the greater is the likelihood of gray market incidence.

Research Method

Study 1: Field Survey of Gray Marketing of Personal Care Products

Our sampling frame comprised U.S.-based manufacturers of branded personal care products (e.g., skin toners, hair and nail care products, medicated soap) that distribute through wholesaler distributors in the professional salon industry. The reliance on external (non-company-owned) distribution intermediaries and the high value-to-weight ratio of the products in this study make this a particularly appropriate context in which to test our hypotheses. According to the Beauty and Barber Supply Institute, the association representing personal care product manufacturers and distributors, more than half of its members had experienced gray marketing of their products in some form or other. Thus, the phenomenon of gray markets is well known to most industry participants.

We defined the term "gray marketing" for informants, and then we asked them to focus on a geographic market in which they had experienced, or were likely to experience, gray marketing. After they identified such a market, we asked them to report their enforcement behavior (i.e., severity, certainty, and speed) in general rather than in response to a particular violation. We did this to assess deterrence attributable to a general propensity for enforcement rather than a particular response. Consistent with previous channel-related research in marketing (Anderson, Hakansson, and Johanson 1994; Anderson and Weitz 1992; Antia and Frazier 2001; Cavusgil and Sikora 1988; Dutta, Heide, and Bergen 1999; Dwyer, Schurr, and Oh 1987), we solicited manufacturers' evaluations of their own severity, detection ability, and speed of enforcement behavior. We developed and refined the survey instrument on the basis of a literature review, interviews with channel management personnel from the personal care products industry, and a mailed pretest.

Measures. Our dependent variable of interest, incidence (INCID), is a dichotomy that describes whether gray marketing occurred during the previous two years. We coded INCID as 1 if the informants indicated that they were aware of diversion of any product from their product line within the specified time period and 0 if otherwise.

We measured the independent variables with multi-item summated scales. The final item sets, response formats, individual item loadings, composite reliability, and average variance explained (AVE) for each scale appear in Appendix A. The preceding metrics provide evidence that the psychometric properties of our measures are satisfactory. Table 1 displays the correlation matrix and descriptive statistics for the variable set. In the following sections, we describe the measurement approach for each variable.

The manufacturer's enforcement severity (SEV) consists of a four-item Likert scale. We derived the items that constitute the scale from the work of Antia and Frazier (2001), but we modified them to ground the measure in our research context. Detection ability (DETECT) reflects the extent to which the manufacturer is able to evaluate the extent and nature of instances of product diversion. We derived the scale for this construct from the work of Dutta, Heide, and Bergen (1999) and, again, adapted it to our research context. The final scale is composed of four reverse-coded Likert items. Enforcement speed (SPEED) refers to the time elapsed between detection of the violation and the manufacturer's undertaking of corrective action. We developed the four specific items that constitute the scale using prior research in sociology and social psychology (Erickson, Gibbs, and Jensen 1977; Howe and Brandau 1988; Howe, Brandau, and Loftus 1996) and modified them on the basis of field interviews.

Price differential (PRDIFF) refers to the extent to which the manufacturer charges different prices for the product across markets. Our scale for this variable consists of a three-item Likert measure. Premium positioning (PREM) describes the extent to which the manufacturer positions the specific product as a high-end "premium" brand. On the basis of our literature search and field interviews, we developed a four-item Likert scale for this variable. Product scarcity (SCARCE) reflects the manufacturer's inability to supply the relevant market with enough product to satisfy demand. We measured the extent of product scarcity with a four-item Likert scale.

Potential for free riding (FR) reflects the extent to which the manufacturer believes that other authorized distributors or unauthorized third parties can gain from the sales efforts of its authorized distributors in that market. During the interviews we conducted, it became clear that we needed to capture the risk of both types of free riding. This corresponds to a second-order confirmatory factor model, in which the observed six items (three items reflecting each first-order factor) are hypothesized to originate from the two first-order factors (AUTHFR and UNAUTHFR), and in turn, the first-order factors originate from a second-order factor.

Customer heterogeneity (HETER) reflects the extent to which the specific market is characterized by distinct customer segments, in which each segment values services differently. We measured this variable with a three-item Likert scale, which we developed and refined on the basis of pretests.

Data collection. The Beauty and Barber Supply Institute agreed to send out a letter on our behalf that explained the purpose of the study and informed each of its members to expect further communication from us. A week later, we contacted each firm by telephone to introduce ourselves, ascertain the willingness to participate, and identify suitably qualified key informants. The modal designation of the informants was general manager; sales and channels managers were also well represented. Of the 581 firms called, we were unable to contact 21, 26 expressed their unwillingness or inability to participate, and another 41 had open lines or used company-owned distribution channels, leaving us with a final sample of 493.

We then sent out a survey packet by mail to the identified key informants at the remaining 493 manufacturer firms. We dropped an additional 20 informants from the study because they indicated that the study did not apply to their current business context. Two further rounds of callbacks and two subsequent mailings yielded a total of 104 usable questionnaires, representing a 22% response rate. Of the 104 responding firms, 40 reported experiencing at least one incidence of gray marketing, and 64 reported otherwise. Nonsignificant differences between early and late respondents (Armstrong and Overton 1977) on the focal variables of the study suggest that nonresponse bias is unlikely. Post hoc checks indicate acceptable levels of involvement (M = 3.92 on a five-point scale; SD = 1.37) and knowledge (M = 4.34; SD = .97) with respect to their firms' dealings in the specific product-market.

Measure validation. Given our sample size and the number of constructs, we conducted confirmatory factor analyses (CFAs) on groups of maximally similar constructs (see Moorman and Miner 1997), namely, the enforcement characteristics (severity, speed, and detection ability) and the contextual variables (price differences, customer heterogeneity, premium positioning, and supply shortage). The higher-order construct conceptualization of free-riding potential necessitated the estimation of 14 additional parameters, thus requiring us to conduct a separate CFA for this construct to meet sample size requirements. The CFA model diagnostics (see Table 2) suggest unidimensionality of the reflective scales. All items loaded on their prespecified constructs and had t-values significant at .05, providing evidence of convergent validity. Discriminant validity of the scales is further supported by the Lagrange-multiplier tests; none of the possible cross-loadings exceeds the critical value of the chi-square with one degree of freedom (Speier and Venkatesh 2002).

Given the significant correlation between enforcement severity and its speed, we undertook a rigorous test of the discriminant validity of these constructs in particular. We asked three academics with expertise in the area of enforcement to sort the eight items that purported to measure severity and speed. All three experts were able to perform the item-sorting task with full accuracy. Interitem correlations among the items measuring severity (average $\rho_{severity} = .68$, $p < .0001$) and speed (average $\rho_{speed} = .73$, $p < .0001$) are at a significantly higher level than cross-construct item correlations (average $\rho_{speed,severity} = .53$, $p < .0001$); t-tests of differences further suggest that the differences in correlations are significant. We also found that the AVE for each construct was greater than the squared correlation between the constructs (Fornell and Larcker 1981), thus providing further evidence of discriminant validity between severity and speed of enforcement. In all, the preceding tests suggest

TABLE 1
Study 1: Descriptive Statistics

	Correlation Matrix												
	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Incidence (INCID)	—												
2. Enforcement severity (SEV)	.08	.89											
3. Enforcement speed (SPEED)	.07	.68*	.92										
4. Detection ability (DETECT)	–.14	.28*	.29*	.85									
5. Price differential (PRDIFF)	.08	–.07	–.15	–.09	.79								
6. Free-riding potential (FR)	.38*	.15	.11	–.31*	–.11	—							
7. Product scarcity (SCARCE)	.08	–.04	–.24*	–.01	–.02	.08	.87						
8. Premium positioning (PREM)	.15	.13	.11	–.00	–.01	.26*	–.02	.89					
9. Customer heterogeneity (HETER)	.26*	.26*	.20*	–.02	–.06	.22*	–.10	.12	.77				
10. SEV × DETECT	–.28*	–.01	–.07	.23*	–.02	–.28*	–.02	–.05	–.04	—			
11. SEV × SPEED	–.10	–.33*	–.47*	–.05	–.09	–.14	.09	.07	–.09	.31*	—		
12. SPEED × DETECT	–.19	–.07	–.10	.31*	–.06	–.23*	.01	.08	–.05	.80*	.27*	—	
13. SEV × SPEED × DETECT	–.12	.38*	.36*	.59*	–.06	–.14	.09	.11	–.11	–.03	–.12	–.07	—
Number of items	1	4	4	4	3	6	4	4	3	—	—	—	—
Minimum	0	4	4	4	3	6	4	4	3	—	—	—	—
Maximum	1	20	20	20	14	30	20	20	15	—	—	—	—
M	.38	13.46	13.57	9.67	5.78	20.45	7.66	14.27	9.34	.68	.28	.29	–.07
SD	.49	4.27	4.31	4.14	2.63	5.02	3.37	4.24	2.7	1.29	1.02	1.02	1.54

*r is significant at $p < .05$.
Notes: Diagonal entries represent alpha reliability values, where applicable.

TABLE 2
Study 1: CFA Results for Reflective Measures

Construct Groups	χ^2	*p* Value	Average Off-Diagonal Squared Residual	Comparative Fit Index	Incremental Fit Index	Tucker–Lewis Index	Lowest t-Value of Loading
SEV, SPEED, DETECT	$\chi^2_{51} = 90.03$	.001	.07	.96	.96	.94	5.81
FR	$\chi^2_{8} = 16.61$	.03	.10	.98	.98	.96	7.36
PRDIFF, SCARCE, PREMIUM, HETER	$\chi^2_{71} = 89.9$	.07	.05	.97	.97	.96	5.26

that severity and speed of enforcement have adequate discriminant validity.

Model specification. We test our hypotheses using a maximum likelihood estimation–based logistic regression model, first specifying the main effects only (Equation 1) and then adding the two- and three-way interactions among the enforcement characteristics (Equation 2) as follows:

$$(1)\qquad P(INCID_i = 1) = \frac{\exp\left(\beta_0 + \sum_{1}^{8} \Sigma\beta_j X_{ij}\right)}{1 + \exp\left(\beta_0 + \sum_{1}^{8} \Sigma\beta_j X_{ij}\right)}, \text{ and}$$

$$(2)\qquad P(INCID_i = 1) = \frac{\exp\left(\beta_0 + \sum_{1}^{12} \Sigma\beta_j X_{ij}\right)}{1 + \exp\left(\beta_0 + \sum_{1}^{12} \Sigma\beta_j X_{ij}\right)},$$

where INCIDi = 1 if firm i reports at least one gray market violation and 0 if otherwise, and

X_{i1} = SEV,
X_{i2} = DETECT,
X_{i3} = SPEED,
X_{i4} = PRDIFF,
X_{i5} = FR,
Xi_6 = SCARCE,
Xi_7 = PREM,
Xi_8 = HETER,
X_{i9} = SEV × DETECT,
X_{i10} = SEV × SPEED,
X_{i11} = SPEED × DETECT, and
X_{i12} = SEV × SPEED × DETECT.

To reduce the potential multicollinearity arising from multiplicative interaction terms (Aiken and West 1991) and to yield coefficient estimates within the observable range of the independent variables (Friedrich 1982; Jaccard, Turrisi, and Wan1990), we mean centered all the explanatory variables and interactions created as the product of the mean-centered components (see Brown, Dev, and Lee 2000; Jaccard, Turrisi, and Wan 1990; Rokkan, Heide, and Wathne 2003).[1]

Table 3 displays the estimation results for both equations. The likelihood ratio for the main effects vector of coefficients is not significantly different from zero ($\chi^2_{(3)}$ = 1.58, p = .66). In contrast, the likelihood ratio is significantly different from zero for the two-way ($\chi^2_{(3)}$ = 6.69, p = .08) and three-way ($\chi^2_{(1)}$ = 2.82, p = .09) interactions. Furthermore, the interaction model (χ^2 = 35.71, p = .0004) gives us confidence that the null hypothesis of all the coefficients being zero can be rejected. The model correctly classifies 80% of the observations, suggesting that the inclusion of the interaction terms is warranted. Therefore, we discuss the findings of this study as inferred from the estimation of the interaction model.[2]

Study 1 results. None of the three enforcement characteristics (severity, detection ability, and speed) has a significant impact on deterrence (incidence) in isolation (b_1 = .11, b_2 = –.04, b_4 = .01). However, our examination of the full model coefficients requires us to separate the main effects from the interaction terms (for a full explanation, see Aiken and West 1991, p. 38; for a recent application in a channels context, see Brown, Dev, and Lee 2000). We do this by differentiating Equation 2 with respect to each of the three enforcement characteristics. Equation 3 shows how INCID varies as a function of SEV (for derivation and details on obtaining simple slopes, standard errors, and t-values, see Appendix B; for the results, see Table 4).

$$(3)\qquad \frac{\partial INCID}{\partial SEV} = b_2 + b_3 DETECT + b_5 SPEED + b_7 SPEED \times DETECT.$$

[1]Main effects in this case represent the conditional effects of each enforcement characteristic on incidence at moderate (mean) levels of the other two facets. This interpretation is distinct from the "constant effect of one variable over all values of another variable" (Aiken and West 1991, p. 38) interpretation, as is the case with uncentered (raw) data. However, both approaches are consistent in that estimates of the latter may be recovered as a special case of the mean-centered approach, if required (Freidrich 1982).

[2]Table 1 shows evidence of considerable multicolinearity between the interaction variables and their components; such multicolinearity is known to inflate the standard errors of the parameter estimates, though the estimates themselves remain unbiased (Jaccard, Turrisi, and Wan 1990). The statistical significance of the higher-order interactions in the presence of the lower-order terms indicates that the imprecision due to multicolinearity does not pose a threat to validity (Buvik and John 2000). Parameter estimates and significance levels remain robust across both model specifications (the main effects–only and the fully specified interaction model), thus lending further confidence in our findings.

TABLE 3
Study 1: Parameter Estimates

Independent Variable	Main Effects Only: Coefficient	Main Effects Only: t-Value	Full Model: Coefficient (Interactions Included)	Full Model: t-Value	Full Model: Hypothesis Supported?[a]
Constant	–.661	–2.73***	–.519	–1.8**	
DETECT (b_1)	–.012	–.19	.109	1.20	H_1 (No)
SEV (b_2)	–.042	–.53	–.041	–.49	
SEV × DETECT (b_3)			–.055	–2.04**	H_2 (Yes)
SPEED (b_4)	.065	.81	.010	.11	
SEV × SPEED (b_5)			–.009	–.59	H_3 (No)
SPEED × DETECT (b_6)			–.008	–.30	
SEV × SPEED × DETECT (b_7)			–.007	–1.68**	H_4 (Yes)
PRDIFF (b_8)	.147	1.60*	.145	1.51*	H_{5a} (Yes)
FR (b_9)	.190	3.01***	.206	2.89***	H_{5b} (Yes)
PREM (b_{10})	.035	.58	.056	.84	H_{5c} (No)
SCARCE (b_{11})	.094	1.31*	.121	1.45*	H_{5d} (Yes)
HETER (b_{12})	.201	2.08**	.194	1.82**	H_{5e} (Yes)
	$\chi^2_8 = 25.44$; $p = .0013$		$\chi^2_{12} = 35.71$; $p = .0004$		

*$p < .10$ (one-tailed test).
**$p < .05$ (one-tailed test).
***$p < .01$ (one-tailed test).
[a]Based on interaction model estimates.

TABLE 4
Study 1: Impact of Enforcement Characteristics on Incidence

Enforcement Characteristic	Estimated Impact on Incidence (Simple Slope)	SE	t-Value
Main Effects			
SEV	.098	.145	.67
DETECT	.246	.152	1.61
SPEED	–.046	.127	–.36
Interaction Effects			
Impact of SEV on INCID at various levels of DETECT (H_2)			
$DETECT_{low}$	.187	.137	1.35
$DETECT_{moderate}$	–.041	.084	–.49
$DETECT_{high}$	–.269	.137	–1.96*
Impact of SEV on INCID at various levels of SPEED (H_3)			
$SPEED_{low}$	–.028	.127	–.224
$SPEED_{moderate}$	.010	.091	.110
$SPEED_{high}$	.048	.087	.556
Impact of SEV on Incidence at various levels of DETECT and SPEED (H_4)			
$DETECT_{high}$ and $SPEED_{high}$	–.43	.157	–2.85*
$DETECT_{high}$ and $SPEED_{low}$	–.11	.157	–.70
$DETECT_{low}$ and $SPEED_{high}$	.27	.157	1.80
$DETECT_{low}$ and $SPEED_{low}$	.10	.157	.65

*Significant at the .05 level (two-tailed test).

The t-value of .098 is not significant at the .05 level. Therefore, we are unable to reject the null hypothesis for SEV, which in turn enables us to reject the main effect we hypothesized in H_1. We evaluate the main effects of DETECT ($\partial INCID/\partial DETECT = .246$) and SPEED ($\partial INCID/\partial SPEED = –.046$) similarly (for estimates, see Table 4); in each case, the main effect is not significantly different from zero. We now proceed to examine the interaction coefficients.

We find that just one two-way interaction is statistically significant: SEV × DETECT ($b_3 = –.055$, $p < .05$). On further probing (see Table 4), we find that strict enforcement behavior has a significant inverse relationship to gray market incidence when it is combined with high detection ability (∂INCID/∂SEV = –.269, $p < .05$). Note that no such deterrent impact occurs under low (∂INCID/∂SEV = .187, $p > .10$) or even moderate (∂INCID/∂SEV = –.041, $p > .10$) levels of detection ability. The preceding result underscores the importance of matched and high levels of severity and detection ability, in support of the interaction we hypothesized in H_2. We fail to find support for the exploratory hypotheses with respect to SPEED's pairwise interaction with SEV (b_5 = –.009). That is, SPEED does not seem to confer any deterrent impact in combination with SEV or with DETECT.

In Table 3, we find that the three-way interaction among SEV, SPEED, and DETECT is statistically significant (b_7 = –.007, $p < .05$), in support of H_4, suggesting that the combination of all three facets of enforcement has a deterrent impact. Post hoc probing of this significant interaction reveals that increasing SEV results in deterrence only when SPEED and DETECT both have high levels (the simple slope of SEV on INCID is negative and significant). As can be seen in Table 4, if either SPEED or DETECT is low, the simple slope of SEV on INCID is not significant.

The significant and inverse relationship between SEV × DETECT and INCID suggests that the combination of high levels of SEV and DETECT is sufficient to exert a deterrent impact on gray market activity. Furthermore, the significant three-way interaction suggests that when SPEED is added to the combination of SEV and DETECT, deterrence is enhanced. Our inability to find similar effects for the pairwise combinations involving SPEED or for a main effect of SPEED suggests that speed must be accompanied by severe action and high detection ability to achieve incremental deterrence. Swift enforcement provides an additional deterrent "boost," but not by itself.

Our hypothesis with respect to the gray market–specific determinants of incidence finds significant support for four of the five contextual variables. The presence of price differentials among markets has a significant, though marginal, effect on gray market incidence (b_8 = .145, $p < .10$). Free-riding potential has a strong, significant, direct relationship to gray market activity (b_9 = .206, $p < .01$). We do not find any support for the hypothesized relationship between premium positioning and gray market incidence (b_{10} = .056). However, we find that product scarcity is positively related to the likelihood of gray market violations, though marginally so (b_{11} = .121, $p < .10$). We also find a strong positive relationship between customer heterogeneity on services and gray market incidence (b_{12} = .194, $p < .05$).

To summarize, our examination of the main and interactions effects suggests that none of the characteristics of enforcement has any significant deterrent impact in isolation. Matched and high levels of detection ability and severity are prerequisites for achieving deterrence, and swift enforcement boosts the preceding interaction.

Study 2: Experiment

We conducted Study 2 to replicate and extend the results of Study 1 with an alternative methodology, context, and measures. First, we conducted Study 2 as an experiment because the dimensions of enforcement severity, detection ability, and speed are likely to be naturally associated in field contexts. Manufacturers that are concerned with gray market activities tend to design detection systems that enable them to identify problems accurately and then react both quickly and severely against the offending firm. In contrast, manufacturers that are not affected by gray market activities are likely to be relatively lax on all three enforcement facets. Given this logic, some combinations of enforcement strategies are unlikely to occur naturally in field settings, such as high severity but low speed and certainty of detection or low severity and low speed but high certainty. The coincident use of these enforcement characteristics is evident in our first study with significant correlations between severity and speed (r = .68, $p < .05$), severity and detection (r = .28, $p < .05$), and detection and speed (r = .29, $p < .05$). Therefore, Study 2 uses an experimental design to examine the full range of possible enforcement strategies and to use orthogonal manipulations that enable us to assess the independent effects of severity, detection, and speed on deterrence.

Second, Study 2 assesses the robustness of the results of Study 1 by examining deterrence from the perspective of the dealer rather than the manufacturer. Given that it is dealers' evaluations of the effectiveness of the enforcement facets that affect their willingness to engage in gray market activities, it is important to understand their perceptions. Study 2 also differs from Study 1 in its use of a continuous rather than dichotomous measure of deterrence, thus enabling us to estimate the psychometric properties of the dependent variable.

Procedure. Participants were 112 MBA students who were recruited by student representatives of an on-campus exchange program at a major university. A donation of $10 was made toward the program on behalf of each participant who completed the study. Sixty-four percent of the participants were male, their average age was 29 years, and they had an average of three years of management experience. Seventy-seven percent of participants had at least one year of experience as "a supplier or dealing with suppliers in a business situation."

After a brief introduction to a study on manufacturer–distributor relationships, participants were randomly assigned to one condition in a 2 (severity: high versus low) × 2 (certainty: high versus low) × 2 (speed: fast versus slow) full-factorial between-subjects design. Participants read a scenario that explained that an electronics components dealer had violated its agreement with a manufacturer by selling $100,000 of integrated circuits outside its territory. The scenario included manipulations of the severity, certainty, and speed of the manufacturer's response. The method assumes that participants project themselves into the hypothetical situation and provide answers that reflect how dealers would actually respond to the situation outlined in the scenario. Evidence suggests that projective methods can accurately represent participants' underlying attitudes and behaviors (e.g., Fisher 1993) and that the judgments of individual managers can provide important insights into organization-level strategies (e.g., Chandy, Prabhu, and Antia 2003). The scenario and manipulations appear in Appendix C. Participants then responded to a series of questions.

The dependent variable was a three-item measure that reflected the degree to which the offending dealer would be deterred from engaging in future gray market activities by the manufacturer's enforcement activities. The items included the following: "In future, the offending dealer would definitely comply with the manufacturer's regulations governing unauthorized sales," "In future, the offending dealer would not dare [to] disregard the resale restrictions of the manufacturer," and "In future, the offending dealer would be deterred from selling the manufacturer's products in an unauthorized manner." The items were measured on a five-point Likert scale, anchored by "very unlikely" and "very likely." The mean of the summated scale items was 2.74, with a standard deviation of .97 and a coefficient alpha of .86.

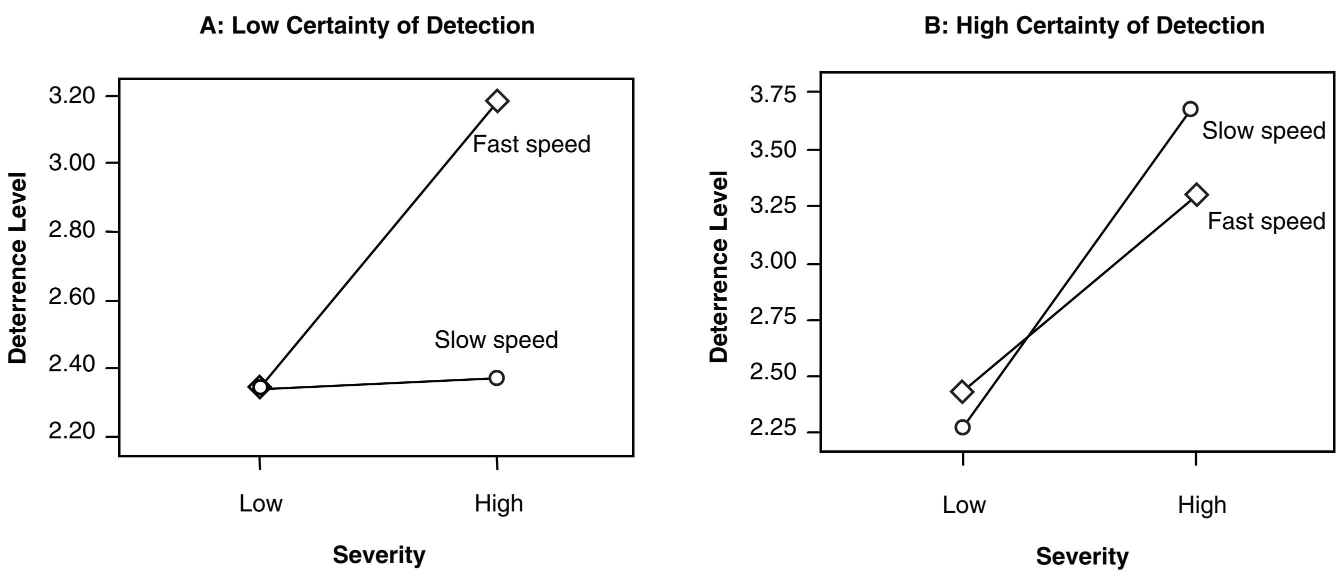
Analysis. We used a full-factorial analysis of variance to examine the manipulation checks and to test the hypotheses. We found a significant effect of the detection manipulation on the item "The manufacturer is very likely to catch dealers who undertake gray market activities" ($F(1, 111) = 131.51$, $p < .01$), a significant effect of the severity manipulation on the item "The manufacturer's response to gray market transactions is severe" ($F(1, 111) = 76.10$, $p < .01$), and a significant effect of the speed manipulation on the item "The manufacturer punishes gray market activity immediately" ($F(1, 111) = 122.77$, $p < .01$). The manipulations had no unintended main or interaction effects.

In terms of the hypotheses, we found significant main effects of certainty ($F(1, 111) = 5.20$, $p < .05$) and severity ($F(1, 111) = 22.81$, $p < .01$) on deterrence. In terms of interactions, the two-way interaction between certainty and severity was significant ($F(1, 111) = 5.23$, $p < .05$), as was the three-way interaction effect ($F(1, 109) = 4.17$, $p < .05$). Examination of the simple effects reveals that severity has a positive effect on deterrence in three of four possible instances: high certainty/high speed ($F(1, 27) = 10.32$; $M_{low\ severity} = 2.43 > M_{high\ severity} = 3.29$, $p < .01$), low certainty/high speed ($F(1, 27) = 3.48$; $M_{low\ severity} = 2.38 > M_{high\ severity} = 3.15$, $p < .10$), and high certainty/low speed ($F(1, 27) = 19.97$; $M_{low\ severity} = 2.31 > M_{high\ severity} = 3.62$, $p < .001$). As we predicted, severity has no effect on deterrence when both certainty and speed are low ($p > .90$). Note that when certainty and severity are high, speed has no effect on deterrence ($p > .30$). We included participants' gender and years of supervisory experience as covariates, but they were not significant ($p > .20$). The analysis of variance interaction results appear in Figure 1.

Study 2 results. The results are consistent with those of Study 1 in three of four possible effects of severity on deterrence. Consistent with Study 1, the results of Study 2 support the view that severity of response alone is insufficient to reduce gray market activities. Increasing the severity of the punishment for gray market violations had no effect when dealer violations were unlikely to be detected and when violators could expect a long period of time before they would be punished. It seems logical that the threat of even the most severe punishment will be ineffective if it has a low likelihood of imposition and if it will only take place in the distant future.

Increasing the severity of the manufacturer's response to gray market activity was effective when it was used in concert with systems that ensured a high likelihood of detection, immediate responses to violations, or both. Consistent with Study 1, participants indicated that future gray market activities would be reduced when the likelihood of detection was high, regardless of whether enforcement speed was fast or slow. The results support the view that deterrence is a function of both the severity and the likelihood of punish-

FIGURE 1
Study 2: Certainty × Speed × Severity Interaction Effect



ment. In contrast to the Study 1, Study 2 found that severity had a deterrence effect when speed was high but the likelihood of detection was low. By implication, speed appears to compensate for detection certainty in some conditions. Despite a low probability of detection and, thus, punishment, participants believed that dealers would be less likely to reoffend if severe punishments were meted out quickly.

Discussion

The results of the two studies are consistent in their support of the deterrence doctrine, despite varying dramatically on various dimensions, including methodology (field survey versus experiment), perspective (manufacturer versus distributor), and measurement of the dependent variable (dichotomous measure of actual incidence versus multi-item measure of future recidivism). Both studies indicate that the severity, certainty, and speed of enforcement interact in their effects on deterrence. The results have important implications for both research and practice in the area.

Research Implications

Prior research in marketing has implicitly taken the relationship between enforcement severity and deterrence to be an article of faith. So well entrenched is this assumption that there has been no attempt to test the efficacy of enforcement in a marketing context. Our central finding is that, by itself, enforcement severity does not deter gray market incidence. As a result, an expanded conceptualization of enforcement is necessary. Our study also sheds light on how the facets of enforcement work together to minimize gray market violations. Across both studies, none of the three characteristics of enforcement (i.e., severity, certainty, and speed) has deterrent value alone. Rather, deterrence is most likely to occur when the penalties for gray market violations are severe, when manufacturers are able to detect violations or mete out punishments in a timely fashion, or both.

The introduction of speed of response further extends knowledge of the subtleties of enforcement. Specifically, we find that swift enforcement bolsters the deterrent impact of high levels of detection ability and severity. The ability to increase the effectiveness of the latter combination is particularly interesting considering that, by itself, enforcement speed has little to contribute to deterrence objectives. This finding is of great importance to the marketing literature on enforcement; it emphasizes the dual imperative for an expanded conceptualization of enforcement, and it forces us to examine the deterrent impact of enforcement rather than take it for granted as research has done to date.

In examining the deterrent impact of enforcement, this study also links the evolving marketing literature on opportunism (Brown, Dev, and Lee 2000; Dahlstrom and Nygaard 1999; John 1984; Wathne and Heide 2000) and enforcement (Antia and Frazier 2001; Bergen, Heide, and Dutta 1998; Dutta, Bergen, and John 1994). The preceding literature bases have tended to develop along distinct paths, despite the obvious linkages. To the best of our knowledge, ours is the first study to test the assumed deterrent efficacy of enforcement. Our findings set the stage for a synthesis of these still disparate research streams.

Our choice of empirical context facilitates an additional important contribution. To date, the literature on gray markets has tended to develop along two lines: analytical models (Ahmadi and Yang 2000; Banerji 1990; Bucklin 1993; Coughlan and Soberman 1998) and descriptive case studies (Antia and Everatt 2000; Cespedes, Corey, and Rangan 1988). By their very nature and design, the preceding efforts emphasize deeper understanding of a select few issues relevant to gray markets. What is needed is an integration and subsequent large-sample validation of the commonly suggested drivers of gray market activity. We address this crucial gap in the understanding of gray markets by developing an integrative model of gray market incidence and by validating this model with both field data and an experiment. Our study represents an attempt to "take stock" of received thought on gray market incidence.

Managerial Implications

Until now, the vocabulary and emphasis of the business and academic press have been limited to enforcement severity. Yet our results suggest that current prescriptions calling for stricter measures against gray market participants are likely to be ineffective. Managers who want to make progress against gray market incursions must invest in systems that increase the ability to both detect and quickly punish violators. It is only when severe enforcement behavior is combined with certainty and/or speed that gray market incidence is significantly curbed.

Our work points out the need to use an integrated approach to the management of distribution channel relations. In addition to devoting attention to enforcement, manufacturers should provide adequate incentives to authorized distributors for the continued provision of valued services in the right mix to the right targeted segment. Due consideration should also be given to pricing and supply issues, in acknowledgment of their potential impact on gray market activity. The combination of all the preceding measures is more likely to lead to desired deterrence objectives.

Limitations and Future Research Directions

Although the two studies we reported herein provide several contributions to academics and managers alike, much work remains to be done. The term "gray marketing" encapsulates a variety of unauthorized sales, including cross-border parallel importation, diversion, and domestic bootlegging, to name but a few. Although cognizant of these subtle distinctions, we were unable to control for the location and specific type of gray market activity because of nonresponse on the particular items in our survey. We have taken initial steps toward understanding the degree to which the deterrence doctrine is generalizable by testing it from both the manufacturer's (Study 1) and the dealer's (Study 2) perspective, but a variety of other industry and violation contexts remain unexamined.

Our empirical context imposed certain constraints on our construct operationalizations. First, the absence of archival data on gray market incidence and the steps taken by manufacturers in response forced us to restate our conceptual framework in terms of detection ability rather than the notion of certainty, as originally conceptualized by the deterrence doctrine. Second, in Study 1, we measured gray market incidence as a binary response in an attempt to strike a balance between examining gray markets in a meaningful manner and minimizing the potential for nonresponse attributable to what could be perceived as excessive probing of a "hot-button" channel issue. In Study 2, we were able to replicate the findings of Study 1 using a continuous measure of deterrence in an experimental context. We consider our studies a stimulus for more sophisticated attempts to capture the intricacies of channel violations and manufacturers' subsequent responses.

Consistent with a well-established body of channels research, we asked manufacturer informants to report their own behavior. In Study 2, we considered the dealer's perspective and found similar results. It would be useful for research to incorporate the simultaneous views of both manufacturers and dealers to understand this issue further.

APPENDIX A
Measures

Enforcement Severity (Composite Reliability = .90; AVE = .69)	
We have a policy of full enforcement of our sales agreements.	.75
We are well known for our strict policy on product diversion.	.75
We have a tough stance on product diversion.	.95
We (would) take strict action against unauthorized sales.	.85
Enforcement Speed (Composite Reliability = .92; AVE = .73)	
Our response to violations is (would be) instantaneous.	.88
We (would) take immediate action against violations.	.83
Very little time (would) elapse between detection of violations and our response to them.	.87
Our enforcement response process is (would be) very timely.	.85
Detection Ability (Composite Reliability = .87; AVE = .63)	
At a given time, it would be difficult to evaluate the extent of product diversion. (R)	.82
Determining compliance with resale restraints requires a great amount of effort on our part. (R)	.56
It would be difficult for us to evaluate the extent to which our product is diverted. (R)	.95
Our evaluation of the extent of unauthorized sales is based on very "fuzzy" information. (R)	.78
Price Differential (Composite Reliability = .80; AVE = .58)	
We maintain a uniform pricing policy between markets. (R)	.88
In general, we try to keep price differences between markets to a minimum. (R)	.80
The price we charge for the product in each market varies considerably.	.57
Free-Riding Potential	
Unauthorized Free Riding (Composite Reliability = .85; AVE = .65)	
Customers may learn about our product from our distributors and purchase it from unauthorized sources.	.91
Our distributors' presales services might stimulate unauthorized sales of the product.	.80
Unauthorized distributors could benefit from the market development efforts of our authorized distributors.	.70
Authorized Distributor Free Riding (Composite Reliability = .92; AVE = .80)	
Our authorized distributors' sales efforts increase sales of other authorized distributors of this product.	.84
The services provided by one authorized distributor may help other authorized distributors' sales.	.92
Authorized distributors could benefit from the market development efforts of other authorized distributors.	.92
Product Scarcity (Composite Reliability = .88; AVE = .64)	
We have trouble keeping up with demand for this product.	.61
Order fulfillment for this product is frequently delayed due to production constraints.	.82
We frequently experience stock-outs of this product.	.93
We do not produce enough product to satisfy demand.	.82
Premium Positioning (Composite Reliability = .89; AVE = .67)	
Our brand name commands a significant price premium in this market.	.74
Our company is considered a market leader in this product category.	.86
We are able to leverage our strong brand name to a great extent in this market.	.87
Our products have a strong reputation in this market.	.80
Customer Heterogeneity (Composite Reliability = .78; AVE = .54)	
Customers in this market require very different service levels.	.61
Our customers have very dissimilar product preferences.	.71
Customers in this market differ considerably in their preference for service.	.60

Notes: All items are measured on a five-point Likert scale, anchored by "strongly agree" and "strongly disagree." (R) = reverse-scored items.

Appendix B
Post Hoc Probing of Interactions

Two-Way Interaction Between SEV and DETECT

The objective of this post hoc probing is to ascertain the impact of severity on incidence for different levels of detection ability. Accordingly, we rearrange the terms of Equation 2 to obtain the simple regression of INCID on SEV at plus and minus one standard deviation of DETECT, respectively (Aiken and West 1991, p. 13). This yields two simple slope coefficients, indicating the impact of SEV on INCID at each level of DETECT.

From Table 3, Equation 2,

$$INCID = -.519 - .041SEV + .109DETECT - .055SEV \times DETECT.$$

If we rearrange the terms,

$$INCID = (-.041 - .055DETECT)SEV + (-.519 + .109DETECT).$$

At $DETECT_L$($DETECT = -4.1447$),

$$INCID = (-.041 - .055 \times -4.1447)SEV + (-.519 + .109 \times -4.1447),$$

or

$$INCID = .187SEV - .971.$$

We obtain the simple slope coefficients similarly for each two-way interaction (see Table 4). Using the variance–covariance matrix of the beta estimators, we then obtain the standard error and t-value for each simple slope.

Three-Way Interaction Among SEV, SPEED, and DETECT

We rearrange the terms of Equation 2 yet again, this time replacing SPEED and DETECT with values plus and minus one standard deviation to represent high and low values of SPEED and DETECT, respectively.

From Table 2, Equation 2,

$$INCID = -.519 + -.041SEV + .010SPEED + .109DETECT - .055SEV \times DETECT - .009SEV \times SPEED - .008SPEED \times DETECT - .007SEV \times SPEED \times DETECT.$$

If we rearrange the terms,

$$INCID = (-.041 - .055DETECT - .009SPEED - .007SPEED \times DETECT)SEV + (-.519 + .010SPEED + .1095DETECT - .008SPEED \times DETECT).$$

We then obtain the simple slopes of SEV for the four combinations of SPEED and DETECT:

At $SPEED_H$ and $DETECT_H$ ($SPEED = 4.3051$, $DETECT = 4.1447$), $INCID = -.355SEV - .167$;

At $SPEED_L$ and $DETECT_H$ ($SPEED = -4.3051$, $DETECT = 4.1447$), $INCID = -.183SEV + .032$;

At $SPEED_H$ and $DETECT_L$ ($SPEED = 4.3051$, $DETECT = -4.1447$), $INCID = .351SEV - .785$; and

At $SPEED_L$ and $DETECT_L$ ($SPEED = -4.3051$, $DETECT = -4.1447$), $INCID = .023SEV - 1.157$.

Using the variance–covariance matrix of the beta estimators, we obtain the standard error and t-value for each simple slope (see Table 4).

Appendix C
Study 2 Scenario and Experimental Manipulations

Avon is a company that manufactures integrated chips (ICs) for use in laptops and personal computers. Avon dealers are expressly prohibited from selling their ICs outside their territory (called gray market activity). Nevertheless, one of Avon's dealers recently sold a large order of Avon ICs (approximately $100,000 in sales) outside its authorized territory to get rid of excess inventory. Avon has the following procedures and policies related to gray market activities by its dealers:

Detection Manipulation

High: The dealer has a high probability of being caught. Avon is able to identify unauthorized sales *over 90% of the time* because of its sophisticated inventory management system.

Low: The dealer has a low probability of being caught. Avon is able to identify unauthorized sales *only 10% of the time* because of an unsophisticated inventory management system.

Severity Manipulation

High: The penalties are significant. If Avon identifies an unauthorized sale, it levies a fine equal to twice the value of the sale (in this case $200,000). If caught, dealers *lose a significant amount of money* on the gray market transaction.

Low: The penalties are not very significant. If it identifies an unauthorized sale, it levies a fine equal to 15% of the contract's value. If caught, dealers *still make a small profit* on the gray market transaction.

Speed Manipulation

Fast: Avon's inventory management system is able to detect gray market activities *immediately*. After a violation is identified, the dealer is notified that [it is] being fined within 24 hours. Consequently, dealers are notified and punished *before* they make any additional gray market sales.

Slow: Avon requires a dealer audit before it can confirm a suspected gray market activity, so contract violations are detected *six months after the fact*. After a violation is identified, the dealer is notified that [it is] being fined within 24 hours. Consequently, many dealers are notified and punished after they have made additional gray market sales.

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