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RISK MANAGEMENT FOR TARGETING CUSTOMS CONTROLS IN DEVELOPING COUNTRIES: A RISKY VENTURE FOR REVENUE PERFORMANCE?

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Summary

Customs authorities in developing countries are often reluctant to forgo systematic inspections for fear of risking revenue loss. Such physical inspections, however, impede rather than facilitate trade. Control selectivity is therefore a key issue in customs administration reform. This paper shows how a sophisticated risk management method can facilitate trade by automatically and rationally selecting transactions, with the end result of actually enhancing revenue performance.

Résumé

Les contrôles physiques des marchandises importées, opérés souvent de façon systématique par les administrations douanières, constituent l'une des entraves les plus importantes à la facilitation du commerce dans les pays en développement. La sélectivité des contrôles est pour cette raison considérée comme un élément-clé des réformes des administrations douanières. Cependant, très souvent, les autorités hésitent à mettre en place cette sélectivité par peur de perdre des recettes. Cet article explique et vérifie empiriquement que, si une méthode sophistiquée d'analyse de risque est utilisée pour sélectionner automatiquement et rationnellement les opérations, la sélectivité des contrôles ne compromet en rien les performances de recettes, bien au contraire.

Key words: customs controls, moral hazard, risk management, fiscal revenues, trade facilitation

I. INTRODUCTION

The easing of constraints on international trade is a key factor in globalization. This is especially the case for developing countries if they are to obtain their fair share of the benefits of globalization. Among these constraints, the problems in customs administrations are the most significant. Thus many developing countries have undertaken ambitious modernization and reform in customs administration to combat corruption and encourage good governance. The challenge is to facilitate trade while safeguarding government revenue. In fact, even though trade liberalization in recent years has encouraged a decline in tariff rates, external trade taxes still account for an average of over 25 percent of government revenues in developing countries, and a sizable proportion of domestic indirect taxation is collected at border areas.

Developing countries still inspect most of the goods physically and systematically during their customs clearance process. Targeted inspections prior to the release of merchandise would minimize the burden of this process. Customs administrations nonetheless tend to view control selectivity with skepticism even when the authorities themselves have embarked upon a modernization program. This is mainly because targeted inspections are perceived as jeopardizing customs revenues.

The purpose of this paper is to show that with the careful design and operational implementation of an appropriate targeting method, there is no risk of jeopardizing revenue performance—quite the contrary, in fact.

II. WHY TARGET CUSTOMS CONTROLS?

Failure to apply customs controls in developing countries: a chronic problem of uncertain, asymmetrical information and moral hazard [1]

Information is a critical factor in customs control issues. If information were perfect with respect to both the reputations of the various importers and the characteristics of the goods imported, customs inspections could be successfully targeted: there would be no point in attempting to inspect the entire volume of merchandise. Customs fraud would then eventually disappear. However, information is imperfect, in the sense that it is uncertain and asymmetrical. [2] To resolve this problem, the customs administration must implement mechanisms to collect information and minimize moral hazard.

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[1] For greater detail regarding these issues, see Macho-Stadler and Pérez Castrillo (2001).

[2] At the time of a customs transaction, the customs officer cannot know in advance if the importer's declaration is fraudulent (thus he cannot know for certain the characteristics of the imported goods—type, quality, value, etc.). At the same time, the customs administration cannot know in advance if the customs control personnel are

In the interest of safeguarding customs revenues, the customs administrations of developing countries have relied upon systematic inspection of all transactions to determine the characteristics of imported merchandise. Unfortunately, the effect of this costly procedure has been limited as it has neglected the importance of moral hazard; customs administrations have been unable to control the behavior of their own personnel. In developing countries, moral hazard has taken the form of widespread corrupt practices (collusion, pressuring, racketeering, etc.). Implementing a system of incentives (compensation, bonuses, promotions, recognition, etc.) can certainly encourage customs officers to conduct themselves in an ethical fashion. Moreover, the customs administration can set up a contract which encourages the customs officer to act in the interest of the community and not in his or her own interest. These kinds of contracts do not, however, effectively limit moral hazard unless the benefits available compensate for the kickbacks anticipated by the customs officers, weighted by the risk of penalty (notably disqualification from civil service employment). In this connection, Eskeland and Thiele (1999) have shown that increasing incentives without implementing significant penalties is ineffective in combating corruption. However, such policies seldom go side-by-side in developing countries.

Frequently, encouraged by international institutions, developing countries[3] have resorted to private inspection companies to remedy the authorities' shortcomings in customs controls. These firms physically inspect (generally prior to shipment[4]) most of the goods and thus identify information on the characteristics of the imported goods (type, quality, etc.). The firms also provide customs with valuations of the merchandise and the amounts of duties and taxes to assess. Each assessment is relatively high because it falls within a range of 0.8–1.5 percent of the f.o.b. value of the import transaction, depending upon the companies and contracts concerned; it is paid for by importers in most cases. However, because in most countries the customs authorities reserve the right to inspect the merchandise physically upon arrival and question the information provided by these firms, moral hazard is endemic and revenue flows suffer (Dutz, 2000; Johnson, 2001).

Consequences of the ineffectiveness of systematic physical inspections of goods prior to their release

The ex ante, systematic, and inefficient inspection of merchandise encumbers customs procedures unduly and undermines the goal of facilitating trade; furthermore, it does nothing to secure revenue.

Mobilizing customs personnel to conduct prior inspection operations could undermine the effective implementation of World Trade Organization (WTO) customs valuations. The WTO "transaction value" is now legally the major method for the valuation of goods. The

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acting ethically (i.e., whether they are making every effort to detect fraud, and whether they are refusing to profit from the professional position for personal gain at the expense of the community).

[3] According to a survey conducted with these companies in June 1999, 37 developing countries were using this type of service.

[4] This means a double inspection for transactors.

direct references which the WTO Agreement makes to the various aspects of the commercial transaction—in particular, the price paid—means that visual examination of goods for valuation purposes is barely relevant. The price paid should thus be the primary criterion in the initial inspections. Except in cases of blatant fraud, the customs authorities at the physical inspections prior to the release of the goods possess neither the data nor the know-how required to dispute this valuation on sound and well-reasoned foundations. Given the reduced role for prior inspections since the adoption of the new valuation system, these inspections unjustifiably obstruct the international trade. Furthermore, using customs personnel for routine inspections takes them away from in-depth post release controls, which alone are capable of ensuring effective verification of the value—and hence of the taxable base— in today's changed environment.

The systematic retention of prior customs inspections—which are exceptionally burdensome for economic agents[5]—serves to entrench practices responsible for the persistence of fraud and corruption. Such inspections foster collusion between importers and customs personnel, who misappropriate (and share out among themselves in the form of rent) a portion of the potential customs revenues.

Targeted customs inspections: a vital step forward

Thus strong arguments —trade facilitation, the need to redeploy personnel more effectively, and the change in mindset needed to make the switch to an up-to-date customs system—exist for limiting the physical inspections carried out prior to the release of goods This shift in policy reflects the spirit of the revised Kyoto Convention, which is intended to standardize and harmonize customs procedures at the international level under the principles of simplification, automation, and efficiency.[6]

As corruption is a major impediment to efficient customs inspections in developing countries, one priority objective must be to minimize the opportunities for collusion between importers and customs personnel. Now, customs officers wield the most bargaining power before the merchandise is cleared—hence the need to minimize prior customs customs inspections and defer most inspections ex post facto.[7] This is especially important because, quite apart from jeopardizing revenue performance, corruption is a major source of economic inefficiency. Collusion between the importer and the customs inspector can mean that products of lower cost and/or of doubtful quality end up on the market. Local producers and importers who are not guilty of fraudulent behavior are thus confronted with unfair

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[5] In the sense that they are costly in terms of time wasted, the financing of inventories, insecure supply, and delays in production.

[6] The revised Kyoto Convention was adopted by the World Customs Organization (WCO) in June 1999.

[7] Needless to say, such a shift must be supported by appropriate personnel training. Such activities are a key component of plans to modernize customs administrations (cf. Keen, 2003).

competition. "Good products" (good importers) are accordingly driven out of the market by "bad products" (bad importers).[8]

Even if limiting physical inspections prior to the release of merchandise—and by extension, selectively targeting transactions for inspection—is both desirable and unavoidable, this change in policy is hampered by the reluctance on the part of (1) personnel, who will have to undergo retraining and who anticipate a sharp drop in their personal income, and (2) authorities, who—in developing countries in particular—must operate under severe budgetary constraints and who are reluctant to release (without inspection) merchandise that they view as collateral for taxes and duties. These are serious concerns at both the microeconomic and the macroeconomic level. To allay these concerns and overcome the skepticism of the authorities, it is essential to identify the best way to target customs inspections without sacrificing budget revenue.

III. ORGANIZING TARGETED INSPECTIONS

Traditional method for targeting operations

Most developed countries and some developing countries, select customs transactions for inspection using traditional targeting techniques. In principle, customs transactions fall into three levels of control: (1) "green channel," with no controls; (2) "orange channel," with in-depth documentary examination; and (3) "red channel," with in-depth documentary control and physical inspection of goods.

Apart from the inspections performed systematically in response to information gathered on particular, fraudulent trade flows, customs transactions are targeted using risk criteria. Customs administration personnel monitoring transaction records usually identify risk criteria on the basis of judgment and experience. This method poses problems at two levels: the process is highly dependent on human intervention and judgment, and keeping abreast of the latest fraudulent practices requires a great deal of effort. The results obtained from this targeting technique are better in developed countries where implicit contracts entered into by the customs administration and customs personnel (incentives/penalties) are broadly complied with. In the developing countries, excessive dependence on the human factor encourages corruption and fraud. The lingering presence of this moral hazard makes it impossible to get at the facts, and adversely affects the efficiency of the inspection process itself. In addition, beyond rendering targeting ineffective, it may also have the perverse effect of favoring fraudulent importers (adverse selection) who thanks to collusion utilize the "green channel" as a matter of course, thereby penalizing honest importers.

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[8] Here we are once again confronted with the problem of adverse selection identified by Akerlof (1970) based on the example of the second-hand car market, in which good-quality vehicles are crowded out by poor-quality models.

Accordingly, the only effective means of targeting customs inspections in developing countries would be to minimize the involvement of customs officers so as to limit moral hazard. To ensure efficiency and to eliminate customs officers' discretion in choosing which transactions to inspect, the method should be based on statistical inference methods of risk analysis of the kind developed by the financial sector.[9]

More sophisticated method(s): automatic and rational targeting of transactions

The goal is to prepare a system to support decisions concerning which transactions to target for verification. Simple risk assessment criteria coupled with a thorough examination of the databases for commercial transactions should determine the selection of transactions. Moreover, private firms engaged in pre-shipment inspections of import transactions are currently offering new targeting techniques designed using their own historical records. A system for the targeting of transactions must be suitably powerful to predict the risk of fraud. For each transaction, the risk assessment—in common with a traditional targeting method— should help arrive at the different levels of customs control (for example, green, orange, or red).

The transaction targeting system should focus on the salient features of an international trade transaction, namely the origin of the goods and the trade routing, the goods traded, and the economic agents involved.

The source and routing of the merchandise are important because they reveal anomalous trade channels. Anomalies are identified on the basis of data for the most customary and normal commercial transactions: the country of origin and country of last export for the merchandise are key factors in assessing any presumption that rules and regulations have been complied with. The place where the invoice was issued and the port (or airport) of embarkation (misapplication of trade flows, intermediary compensated, etc.) are also key factors. The nature of the goods (liability for taxation, restrictions, prohibitions, restrictive measures, quality controls, preferential tariff arrangements) and valuation are two key factors for determining fraud. The transactors concerned are the final piece in the puzzle: the importer may be the primary transactor, but other operators are also involved in the sequence of operations (the exporter, the shipper, the banker, the freight forwarder, etc.). On the basis of these components, it is possible to design a targeting system which identifies information by combining four different approaches:

The first approach consists in checking all new transactions, to the extent that they affect one transactor, one type of merchandise or one routing on which the database provides no information, and which must therefore be viewed in isolation from the historical record. This systematic inspection process should encourage transactors to identify themselves correctly. Correct identification is essential for the customs administration (but also for the tax

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[9] See Freixas and Rochet (1997).

administration) inasmuch as post release controls are expected gradually to take over from prior inspections of merchandise.

The second approach derives from examining the documents included in the importation file and statistically reviewing comprehensive series and background information in order to draw conclusions regarding the risks of fraud. For each transaction, this second approach determines the likelihood of fraud on the basis of objective risk criteria determined by statistical inference methods (rational method). The initial step involves determining the fraud criteria using an ex post analysis of the trade database. A database is thus a prerequisite for carrying out any ex post analysis of fraud. Each characteristic of an international trade operation (concerning the routing, the merchandise, and the transactors) constitutes a potential « fraud criterion ». Each criterion receives a notation between 0 and 1, a basic score which reflects the frequency of fraud associated with the criterion in question. An econometric analysis selects and weights the relevant criterion.
The second step consists in applying the weighted criteria to each new transaction in order to determine the likelihood of fraud (final score) for that particular transaction, and ultimately the level of custom control.

The third approach—which is more radical—focuses on the systematic inspection of a transaction (i.e., blocking the release of shipment pending inspection) on the basis of factors linked to certain of the transaction's characteristics (e.g., operations involving an amount exceeding x units of value, the fact that the economic agent in question has undergone no inspections in the last x weeks, etc.).

The fourth approach involves a purely random selection. This method ensures that the inspections are not allowed to follow a predictable pattern, while making it possible to adjust the rate of inspection.

In conclusion, the general system determines the likelihood of fraud for each new transaction and accordingly—since the proportion of transactions chosen for inspection has been determined by the competent authorities—selects the control channel for the customs transaction in an automatic and rational (i.e., not subjective) manner.

IV. EMPIRICAL VERIFICATION OF THE EFFECTIVENESS OF THE AUTOMATIC AND RATIONAL TARGETING OF TRANSACTIONS FOR INSPECTION

In developing countries, the ineffectiveness of systematic customs inspections and frequent collusion between customs officers and importers mean that historical records on customs reassessments fail to paint a representative picture of true or actual customs fraud. The poor quality of the data obstructs the implementation of a system, as well as delaying trade facilitation and modernization efforts.

The approach described in the preceding section may help target transactions for inspection without jeopardizing revenue, however, irrespective of the initial quality of the historical data used to design the system.

Method

This approach is tested here for two African countries, A and B, which do not use selective inspection of import transactions, with the result that their customs administrations perform poorly. Country A has for several years been implementing a program for inspecting import transactions by working with a private pre-shipment inspection company. Country A thus theoretically possesses high-quality historical data on customs fraud and the magnitude of the potential reassessments associated with them. Country B has never used the services of a private pre-shipment inspection pre-shipment company. Country B has, however, recorded in its computer system all the reassessments deriving from systematic inspections conducted by customs officers prior to releasing the goods. Intuitively, the "control selectivity" system ought to pose greater risks in Country B than in Country A, because the initial information upon which this approach is based is of poorer quality.

The databases made it possible to calculate 18 criteria for Country A and 28 criteria for Country B. The scores assigned to each criterion were calculated differently for Country A and Country B, reflecting the specific characteristics of each database. The database for Country A covers the entire period of one year but not the full range of transactions, inasmuch as the task of inspecting import transactions has been entrusted to a number of private inspection companies. Country B's database encompasses all the import transactions for one quarter. For Country A, the calculated scores were determined on the basis of the 10 most recent operations for the criterion in question preceding each transaction; using this method, the econometric adjustment of the weights is better than when all the prior transactions are taken into account. For Country B, the short period covered by the database has not made it possible to use the same procedure, and the scores were calculated on the basis of the full set of transactions without taking account of the timing of their appearance. For Country A, there is fraud when the private pre-shipment inspection company records a reassessment of over US$200, and for Country B when customs administration opens a reassessment dossier.

Results

Fraud criteria

Estimating a PROBIT [10] model for each country helps identify the key fraud criteria shown in Table 1.

Table 1 – Econometric adjustment determining the weights for the risk criteria

Endogenous variable: fraud (0/1)	Country A	Country B
Exogenous variables		
C1: Country of last export/product	1.56	1.03
C2: Importers	1.61	
C3: Importers/country of last export		1.01
C4: Importers/products	2.33	5.03
C5: Importers/customhouses		1.15
C6: Rate of taxation	1.33	
C7: Value of transaction	1.57	
Constant	- 3.09	-3.11
Pseudo-R²	0.66	0.77

Note: all the coefficients are significant at 1 percent level.

For Country A, the criteria "rate of taxation" and "value of transaction" may introduce a bias in the estimates because these two variables may not be exogenous. In the absence of an effective test to assess the problem of exogeneity in a PROBIT estimate, these two variables have been retained because the estimates present a better pseudo-R² on a with-or-without basis, and because the predictive power of the method is improved when they are included.

Coupled with the country of last export and with the importer, the "product" appears to be the main yardstick for fraud in both countries. There are thus opportunities for fraud for certain products, and certain importers who specialize in availing themselves of those opportunities.

The two countries have different fraud criteria. Accordingly, the rate of taxation and the value of transaction are the yardsticks in Country A, although not in Country B. That is partly accounted for by the tariff structure of the two countries. Country A has a complex tariff structure with rates that are both numerous and high, whereas Country B has a reformed, simplified tariff structure with a comparatively modest maximum rate.

Finally, the relative degree of virtuous behavior of customs officers is clearly demonstrated for Country B because the customhouse—coupled with the importer—is a source of fraud.

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[10] $P(Y_i=1)=\phi(\sum_j c_j.x_{ij})$; $P(Y=1)$: likelihood of fraud for transaction i; ϕ: normal distribution function; x_{ij}: basic notation j assigned to transaction i.

The predictive power of the method

Using these estimates concerning fraud criteria, the predictive power of the method can be assessed. In fact, the aim is to recalculate on an ex post facto basis the total score that would have been assigned to each transaction, taking account of its characteristics and the notations assigned to each of the criteria,[11] and then determine whether the transaction was actually fraudulent.

Tables 2 and 3 present the results for Countries A and B respectively. The transactions are grouped together by final score in Column (1); Column (2) shows the number of transactions which have a "calculated" final score falling between the upper and lower limits of each category; Column (3) steadily accumulates the number of transactions starting with the highest category (expressed as a percentage); Column (4) indicates the number of transactions in each category that have been the subject of some form of customs reassessment; Column (5) presents the rate of reassessment by category;[12] Column (6) shows the number of reassessments for the category relative to the total number of reassessments; Column 7 steadily accumulates the number of reassessments starting with the highest category (expressed as %).

Table 2 makes it possible to verify the ability to predict the risk of fraud for Country A by comparing Columns (3) and (7). Accordingly, by inspecting all those transactions which have a score higher than 0.1—i.e., 25 percent of transactions—this method captures 93 percent of the reassessments performed by the private inspection firm.

For Country B, the results are just as significant (Table 3). By inspecting 2.3 percent of the transactions (i.e., those transactions with a total score greater than 0.1), this method captures 83.8 percent of the reassessments. These results suggest that in Country B, most of the reassessments currently being performed are concentrated on a very small number of transactions, virtually all of which possess the same characteristics.

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[11] Thus, for Country A, the likelihood of fraud (final score), indicated as PF, is obtained using the following formula:

$$PF = \phi(-3.09 + 1.56\ C1 + 1.61\ C2 + 2.33\ C4 + 1.33\ C6 + 1.57\ C7)$$

And for Country B:

$$PF = \phi(-3.11 + 1.03\ C1 + 1.01\ C3 + 5.03\ C4 + 1.15\ C5)$$

[12] Column (4) divided by Column (2) expressed as a percentage.

Table 2 – Country A: Predictive power of the system for selecting transactions for inspection

category by final score	Number of transactions in the category	Cumulative percentage of transactions	Number of transactions subject to reassessment	Rate of reassessment by category	Percentage reassessment rate in the category relative to the entire amount of reassessments	Cumulative percentage rate of reassessment
(1)	(2)	(3)	(4)	(5)	(6)	(7)
[0.9; 1]	3546	9	3455	97	54	54
[0.8; 0.9]	530	11	411	78	6	60
[0.7; 0.8]	457	12	314	69	5	65
[0.6; 0.7]	429	13	259	60	4	69
[0.5; 0.6]	494	14	256	52	4	73
[0.4; 0.5]	552	16	274	50	4	77
[0.3; 0.4]	678	17	272	40	4	81
[0.2; 0.3]	1005	20	335	33	5	87
]0.1; 0.2]	2165	25	403	19	6	93
[0; 0.1]	28797	100	455	2	7	100
Total	38653		6434	17		

Table 3 – Country B: Predictive power of the system for selecting transactions for inspection

category by final score	Number of transactions in the category	Cumulative percentage of transactions	Number of transactions subject to reassessment	Rate of reassessment by category	Percentage reassessment rate in the category relative to the entire amount of reassessments	Cumulative percentage rate of reassessment
(1)	(2)	(3)	(4)	(5)	(6)	(7)
[0.9; 1]	870	1.3	843	96.9	62.5	62.5
[0.8; 0.9]	29	1.4	19	65.5	1.4	63.9
[0.7; 0.8]	49	1.4	24	49.0	1.8	65.7
[0.6; 0.7]	51	1.5	26	51.0	1.9	67.6
[0.5; 0.6]	81	1.6	33	40.7	2.4	70.1
[0.4; 0.5]	56	1.7	34	60.7	2.5	72.6
[0.3; 0.4]	87	1.9	46	52.9	3.4	76.0
[0.2; 0.3]	113	2.0	36	31.9	2.7	78.7
]0.1; 0.2]	196	2.3	69	35.2	5.1	83.8
[0; 0.1]	146856	100	219	0.1	16.2	100
Total	148388		1349	0.9		

The quality of the econometric adjustment for Country A seems better than for Country B. In Country A, the rate of reassessment by category(5) declines with the calculated likelihood of fraud (1): this is not the case for Country B. This would tend to demonstrate that the pre-inspection carried out by a private company in Country A is better able to identify the risk of fraud. However, given the low number of transactions included in the intermediate category for Country B, that does not undermine the validity of the method nor does it pose a real prediction problem for that country. Furthermore, the improvements in the quality of the inspections carried out by the inspectors and the customs declarations filed by economic agents—as the expected consequences of implementing a targeting system—should make it possible to bring the database gradually up to the required standard and thus enhance the overall effectiveness of the system for the rational and automatic selection of customs transactions for inspection.

The PROBIT-type estimates are based on the assumption of a normal distribution of the error term (Gauss rule). In the case of a distribution not in conformity with the Gauss rule, the coefficients for the exogenous variables (fraud factors) are biased and the predictions of fraud are erroneous. The relevance of the model can nonetheless be determined by calculating the number of false predictions. For each observation where the likelihood of fraud is 1, one looks to see whether an instance of fraud has actually been found. Thus, for those transactions included in the [0.9; 1] score category—i.e., those which have a likelihood of fraud of almost 1—only 2.5 percent of the transactions were incorrectly predicted for Country A and 3.1 percent for Country B. In addition, for each observation where the likelihood of fraud is close to 0 [0; 0.1]), the incorrect predictions represent 1.6 percent for Country A and 0.1 percent for Country B. By themselves, these upper and lower categories represent 83.6 percent and 99.5 percent of transactions for Country A and Country B, respectively (Tables 2 and 3).

Likely impact on revenues

If one postulates a significant relationship between the number of cases of fraud identified and the anticipated amounts of tax and duty reassessments resulting from these fraudulent transactions, the additional revenue in the two countries may be deduced.

In Country A: The revenue impact will depend on the extent to which the customs administration and the private inspection company can work together effectively. If this cooperation is negligible, then the direct impact on revenues (following the targeting of inspections conducted by the company) will be zero. In fact, the situation should not be expected to change significantly. If the customs authorities use the information provided without questioning it, then the revenue performance will be maintained thanks to the optimal predictive power of the method. If the customs administration in Country A carries out its own inspections without regard for the information generated by the company, then the targeting will show no improvement in revenues and the private company's efforts will continue to have zero effect on revenues. In short, the targeting of customs inspections in both examples will change neither the moral hazard nor the quality of the information.

Conversely, provided the targeting of inspections is accompanied by meaningful cooperation between the company and the customs administration (which initially doubts the information provided to it), the quality of the information used will improve and the moral hazard will fade. In this case, the revenue impact will be positive.

In any event, the overall cost of the pre-shipment inspection company's services can be expected to decline significantly over time as the number of inspections performed by the company diminishes. The reduction in costs, however, is not expected to be too great at the outset in view of the costs entailed by the design and operational implementation of the targeting system, if operated by the pre-shipment inspection company, and not by the customs administration itself.

In Country B: The satisfactory predictive power of the method ensures revenue stability in the short term. At the same time, the fact that this method is rational and automatic—while minimizing moral hazard—will help to raise revenues in the medium term. In fact, the state can expect to recoup a sizable portion of the rents formerly shared out among customs officers and economic agents. Furthermore, the redeployment of personnel previously engaged in physical inspections of merchandise to post release controls (in which the moral hazard is reduced), can be expected gradually to enhance the quality of the latter controls. This will improve the quality of the database, and thus of the available information. This enhancement of the information will in turn have a beneficial impact on revenue.

V. CONCLUSION

Targeted customs inspections (previously relatively uncommon in developing countries) are now a prerequisite for facilitating trade as well as for safeguarding customs revenues. Such inspections must therefore be a priority in programs for modernizing customs administrations. The results of the analyses presented in this paper show that provided the targeting method is well chosen, selectively targeted inspections do not jeopardize revenue performance, and may have a positive impact on revenue levels. These beneficial effects will be enhanced if the selectively targeted inspections go hand-in-hand with the customs administrations' efforts to achieve meaningful progress in related areas (computerization, personnel training, and management, in particular).

In the two cases described in this paper, the automatic and rational targeting of transactions for inspection ensures at least the same level of revenue as systematic inspections. Furthermore, it is interesting to note that the use of a private company—supposedly a guarantee of good-quality historical data—is not essential for developing such a system without sacrificing revenue.[13] Conversely, if they wish to use these methods, customs

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[13] Conversely, the use of a private company may be justified for other reasons (for example, because there is too much resistance within the customs administration to the implementation of selectively targeted inspections).

administrations must ensure that their computer systems incorporate data on customs reassessments.

Paradoxically, it is in those countries where customs administrations are least effective that the authorities must swiftly begin using the most sophisticated techniques to minimize moral hazard. The greater the initial moral hazard is, the greater the beneficial impact on revenues will be. Also paradoxically, it is in those countries where the data are initially poorest that the greatest potential revenue gains are to be realized through the use of selective targeting. Reducing moral hazard makes it possible to improve the quality of information—and consequently improve the results of the inspections—thereby building a kind of momentum ensuring effective customs inspections.

Developing country governments need not hesitate about implementing systems for the targeting of transactions for inspection for fear of losing revenue. This change in attitude ought to encourage them rapidly to incorporate appropriate risk analysis—a key factor in trade facilitation—into their overall strategies for modernizing their customs administrations.

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