

**Trade Liberalization and Bribes**  
**Liberalización Comercial y Sobornos**

Bonnie J. Palifka

**ABSTRACT**

In this article I examine the relationships between (tariff and non-tariff) trade barriers and bribery among customs agents, taking into account the incentives of each of the agents involved: importers, customs officials, their supervisors, and the central government. This examination consists of three parts: (1) a game-theoretic analysis of the decisions of the agents, (2) a statistical method for measuring the "level of corruption" in customs, defined as the proportion of customs agents who accept bribes, and (3) an econometric model to estimate the effects of various factors on the monetary value of these bribes. Application of the model requires the use of data that are not in the public domain; it may be of interest to governmental agencies interested in this topic. The case of Mexican customs on the border with the United States is presented as an example of the effects of changes in tariffs and customs regulations on bribery.

**RESÚMEN**

Este artículo examina las relaciones entre las barreras comerciales (arancelarias y no arancelarias) y los sobornos en las aduanas, tomando en cuenta los incentivos mutuos de que gozan los agentes involucrados (importadores, oficiales, supervisores y el gobierno federal). El trabajo propone tres puntos: (1) analiza las decisiones de los agentes con base en la teoría de juegos; (2) considera un método estadístico para medir la "tasa de corrupción" en aduanas, definida como la proporción de oficiales aduanales que están dispuestos a aceptar sobornos entre la totalidad de estos; y (3) postula un modelo econométrico para estimar el efecto de distintos factores en el valor monetario de los sobornos. La aplicación del modelo requiere de datos que están fuera del dominio público, por lo que sería particularmente atractivo para instituciones gubernamentales que cuenten con los datos y se interesen en el tema. Se presenta el caso de las aduanas mexicanas en la frontera norte para ilustrar el impacto de la reforma comercial en los sobornos.

**I. INTRODUCTION**

A number of economic studies<sup>1</sup> have shown that corruption has negative effects on economic growth. There are two reasons for this relationship: bribes, in some cases, constitute an increase in costs for investors and importers; and corruption in general may introduce or increase uncertainty in the economic environment. With this knowledge in hand, many governments have tried to design policies aimed at reaching a "target level of corruption"<sup>2</sup> that is lower than the actual level. Such policies include higher wages, augmented monitoring, and stricter punishment, all of which inflict higher costs on the government. Since many of these governments are also undertaking austerity policies, there is a tradeoff between budget and anti-corruption enforcement. In addition, because corrupt practices are in many places reinforced through social institutions, policies designed to reduce corruption may be difficult to implement.

Free trade, lauded for the benefits accruing to specialization in one's comparative advantage, may have the secondary effect of reducing corruption among customs officials by reducing the opportunities for bribery. This paper lays out the theory supporting this assertion, and elaborates an econometric model designed for the purpose of testing it. The case of Mexican Customs Administration was chosen because the North American Free Trade Agreement (NAFTA) required the immediate elimination of many tariffs from a relatively high average.<sup>3</sup> Several factors will affect the measurement of the effect of these tariff reductions on bribes: since 1990, the Mexican Customs Administration has been modernized, reorganized, and computerized to increase efficiency and reduce corruption; the personnel have been replaced almost entirely; and non-tariff regulations have been introduced even in the wake of NAFTA. These factors can be accounted for econometrically. The role of the Mexican Customs Broker, however, must be considered outside the econometrics: the Broker may be capturing some of the rents that previously accrued to the Customs official in the form of bribes; in addition, increased competition among Mexican Brokers may have contributed to a reduction in bribes.

Economic and social theories provide us with a basis for predicting the effects of these administrative and commercial changes on both the type of corruption that will exist, and the level of bribes that will be received. Specifically, competition decreases the level of bribes, while monopoly increases it. High taxes lead to "corruption with theft", in which the customs agent or other bureaucrat take a bribe *instead of* charging the tax, so the government loses revenue; lower taxes lead the agent to raise false barriers in the form of

---

<sup>1</sup>Some examples are: Alam (1990), Mauro (1995), Shleifer and Vishny (1993).

<sup>2</sup>A recent example of such a policy design is presented in Bac (1996).

<sup>3</sup>The U.S. side of the border was not studied because U.S. tariffs were already relatively low, therefore the corruption that occurs there is related to drug trafficking rather than tax evasion.

queues and rejected paperwork, so that they can collect a "speed fee" *in addition to* the official taxes and fees. In this case, the government receives its revenue, and has less incentive to enforce anti-corruption laws, as long as the bribes do not raise costs to the point that imports are seriously diminished. Some of these bribes may actually be collected as fees by brokers, and distributed later to officials.

This paper both describes the theory and applies it to the special case of Mexican Customs Administration, in the following manner: definitions of bribery and the market determination of bribes are presented in Section II. Mexican Customs Administration and regulation since 1990, as well as the opportunities for bribery afforded by it, are detailed in Section III. The econometric model of Section IV provides a means for determining the factors that influence the monetary value of a particular bribe, information that may be useful to any entity that wants to reduce corruption by making it less lucrative. Section V offers some concluding remarks and extensions.

## II. BRIBERY

From a policy perspective, there are two types of graft, which Schleifer and Vishney (1993) categorize as "corruption with theft" and "corruption without theft".

*Corruption with theft* includes the policeman who accepts a bribe and lets the motorist go, or the customs officer or tax collector who accepts a bribe and falsely reports the value of goods imported or of the property to be taxed. The negative effects are clear: (1) the government budget suffers; (2) in the case of the motorist, illegal or dangerous behavior may not be deterred. The positive effects are lower costs to those engaging in commercial activity, whether that activity be trade or direct investment. The corrupt official may actually help consumers and investors get around excessive red tape and other official procedures that can bog down economic activity and impede growth.

In *corruption without theft*, the official accepts payment to overlook a failure of the client to meet regulations (*subversion*). "Officials can also create new sources of bribery, or increase the revenues from existing sources, by altering official regulations so as to increase the uncertainty associated with the supply of the controlled resources. Applicants may now be persuaded to offer bribes, or raise their previous offers of bribery, in order to have the added uncertainty reduced or eliminated."<sup>4</sup> In this case (*extortion*), the official introduces a source of inefficiency: a long waiting time or extra paperwork. In both types of corruption without theft, the payment is **in excess of** the official tax or fee. The state still gets its revenue, but the consumer, traveler, or investor faces higher costs. The overall

---

<sup>4</sup>Alam (1990), 93.

effect of such corruption may be to diminish these economic activities (if the bribes are costly enough to dominate any competitive advantage the country may have) and ultimately reduce the revenue collected by the state. In the short run, the higher costs are transferred to the consumer in the form of higher prices, effectively causing a transfer from the consumer to the official.

As long as the forms of corruption are known and the size of the correct bribe is fairly predictable, from the investor's point of view it should be considered nothing more than an extra cost to be taken into consideration, just as one automatically expects to pay an extra 20-25% in taxes and tips at restaurants. But if the bribes are a source of uncertainty or risk (if the bribe size is unpredictable or if many officials need to be bribed, any one of which may fail to cooperate), an investor or importer may find doing business in that country unattractive: how often would you go out for dinner if you didn't know whether the taxes and tip would be 10% or 200% of what you paid for the meal?

### ***Market Determination of Bribes***

We can imagine a market for "bent rules", in which the price of this "good" is a bribe. Equilibrium prevails where supply—determined by the government official—meets demand—in the case studied here, the demand by importers for "bent rules". Importers are willing to pay a bribe only insofar as it represents a lower cost than that imposed by not paying the bribe (and paying the tariff, or waiting for processing, or obtaining the appropriate paperwork).

The relationship between bribes ( $B$ ) and the proportion of transactions that involve "bending the rules" ( $q$ )<sup>5</sup> is shown in Figure 1.<sup>6</sup> The demand for bribes by importers ( $D$ ) is a function of profit relative to using domestic goods ( $P$ ), the tariff imposed ( $t$ ), and official regulations or extra-official inefficiencies ( $R$ ). The supply of bribes by officials ( $S$ ) is a function of the officials' wages, the probability of detection, and the punishment imposed if detected ( $X$ ). The equilibrium bribe ( $B^*$ ) and illicit transactions ratio ( $q^*$ ) are determined where supply and demand meet, as shown in **(a)**.

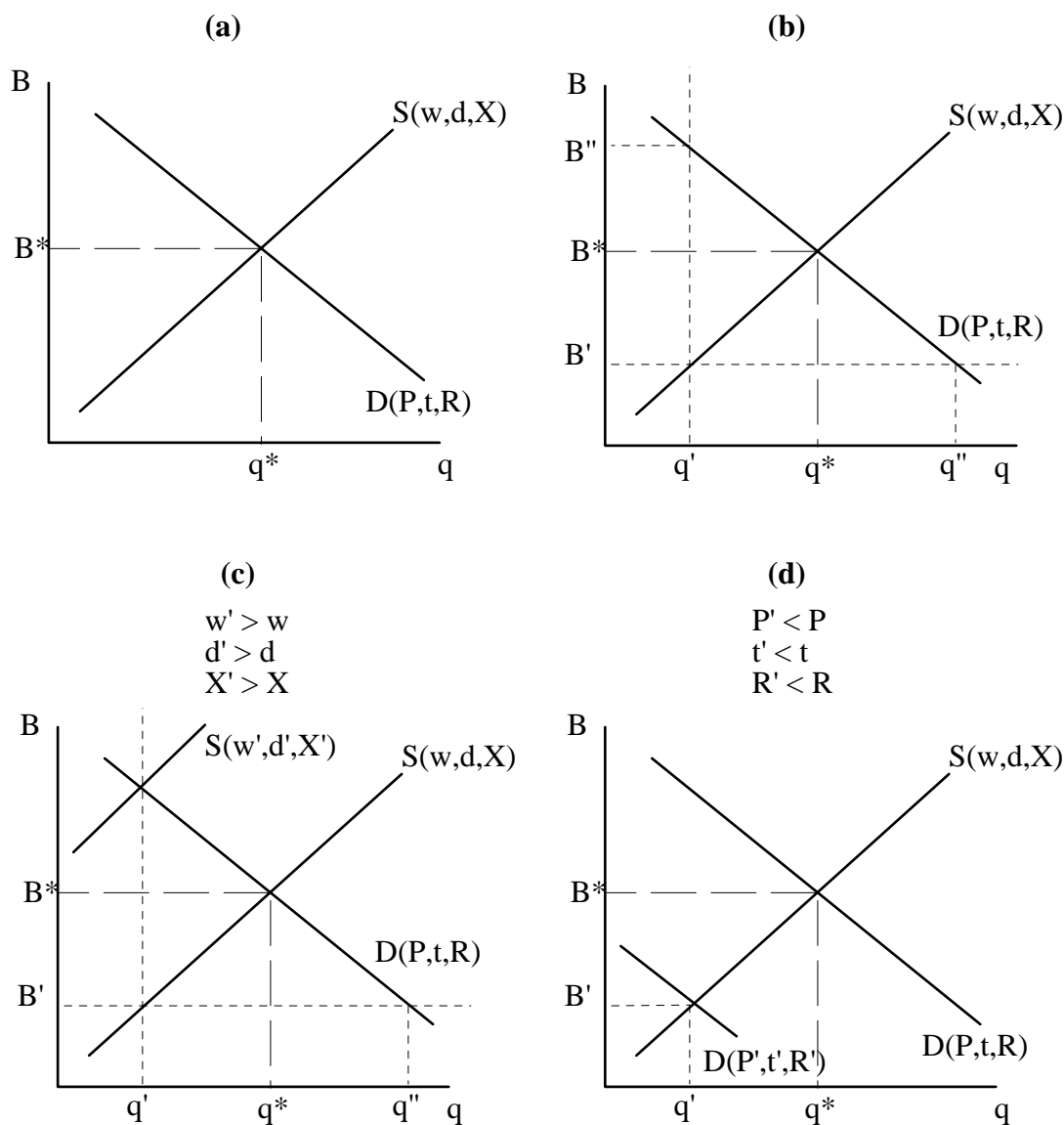
If the government decides to reduce corruption to some target,  $q'$  (**(b)**), the result is a transfer of surplus from importers (and, ultimately, consumers) to officials in the

---

<sup>5</sup> $q = (\text{number of transactions involving bribes}) / (\text{total number of transactions})$ . This is used instead of the number of transactions involving bribes because that may increase simply as a result of a higher number of transactions.

<sup>6</sup>This is a very simple model that ignores the monopoly power of the official and the possibility of collusion among officials or between the officials and their supervisors.

**Figure 1. The Market for "Bent Rules"**



amount symbolized by the rectangle demarcated by  $B'$ ,  $B''$ , and  $q^*$ : officials would supply  $q^*$  for only  $B'$ , but are able to charge  $B''$ . The dead weight loss is a result of the secrecy and extra precautions that must be taken by those who continue to engage in bribery. Should the government choose instead to prosecute any official observed to accept a bribe over  $B'$  (essentially a limit on illicitly-obtained wealth), the target level of corruption ( $q'$ ) is reached, but the presence of excess demand ( $q''-q'$ ) indicates that market inefficiencies remain.

An increase in wages (**c**) may<sup>7</sup> cause officials to reduce the supply of "bent rules" as they value continued employment more highly; this result, however, depends on the enforcement of anti-corruption laws. The equilibrium bribe in this case is higher than the previous bribe, and investment and/or imports may suffer. Furthermore, the wage increase required may be infeasible given budgetary constraints.

Anti-corruption campaigns, although often successful in the short-run, are usually unable to eliminate corruption (or reduce it to "acceptable" levels) in the long run: once the campaign is over, corruption returns.<sup>8</sup> Legislation may also be insufficient: Theobald (1990) indicates that anti-corruption legislation was passed many times in England during the 15th and 16th centuries, but with little effect; corruption was also a problem in England in the late 18th century. As in Mexico in the 1990s, for England these were "periods...of rapid commercial expansion and social change. The point is, however, that attempts at reform always ran up against the *dominant patrimonial ethos* which made any objective and systematic application of rules and laws impossible"<sup>9</sup> As long as officials expect to have the power to take bribes and the people expect to be able to get what they want or need through bribery, it will persist despite legislation against corruption.

On the other hand, when tariffs or non-tariff regulations are reduced (from  $t$  to  $t'$  or from  $R$  to  $R'$ , respectively) or domestic producers become more competitive internationally (represented by an decrease from  $P$  to  $P'$ ) as in (d), the demand for bribes is reduced, as indicated by the shift of  $D(\cdot)$ .<sup>10</sup> This has the natural result of reducing both the proportion of transactions involving bribes *and* the bribe itself, without the cost, political and social difficulty, and market efficiencies involved in anti-corruption campaigns. This constitutes, then, yet another argument in favor of free trade.

### III. MEXICAN CUSTOMS ADMINISTRATION

In Appendix I, I sketch the outlines of a game-theoretic, general equilibrium model for bribes in the Mexican Customs service. Nevertheless, I recognize that "...corruption cannot be combated...[by] localizing the individual decisions of specific functionaries."<sup>11</sup> In this section, I describe the principal actors, procedures, and regulations relevant to Mexican Customs Administration, as well as the socio-historical foundations of corruption in Mexico and in Customs, in particular, that are the basis for expectations formation where

---

<sup>7</sup>The effect is ambiguous. See Palifka (1997).

<sup>8</sup>See Lui (1986) for documentation of this phenomenon in China.

<sup>9</sup>Theobald (1990), 41.

<sup>10</sup>The shift may not be quite as large as indicated in the graph, especially if officials are able to introduce new extra-official requirements.

<sup>11</sup>Zinser (1996), 87.

bribes are concerned, and that may not be immediately changed with the issue of a regulatory decree, for "the persistence of cultural traits in the face of changes in relative prices, formal rules, or political status makes informal constraints change at a different rate than formal rules."<sup>12</sup>

### ***Mexican Customs Administration***

The participants in Mexican Customs Administration for cross-border imports are of four types: governmental, administrative, services, and the customer. Within government, the federal government and the local government are at odds, for the federal government dictates policy and requires tariffs and as much as eighty per cent of tolls to be sent to Mexico City, while the local governments are responsible for building and maintaining infrastructure. The administrative agents are the customs officials who man the booths, the inspectors, and the associated port authority. The services industry consists of the Mexican Customs Brokers, through whom all shipments are required to be processed, and the Brokers' Association; cross-border transport companies; and domestic Mexican carriers.<sup>13</sup> The customer is the importer.

All imports<sup>14</sup> into Mexico must be processed by a Mexican<sup>15</sup> broker or customs deputy before arriving at the Mexican Customs Administration. The goods arrive at the broker's storage facilities to be counted and recorded. The customs broker fills out the manifest electronically and sends it to the local Brokers' Association, which forwards it to the Customs Administration. Any required duties are paid by electronic deposit or transfer. The shipment is taken to a forwarder (border transport company), which carries it to Mexican customs. Once customs are passed, the goods are transferred either to storage facilities on the Mexican side, or directly to a Mexican carrying company,<sup>16</sup> which takes the goods to their final destination.

### ***Pre-NAFTA Customs Regulations***

Even before the NAFTA negotiations started, Mexico began liberalizing trade. Between 1984 and 1991, the average tariff for goods entering Mexico fell from 23.5% to

---

<sup>12</sup>North (1990), 87.

<sup>13</sup>Large companies may also contract a Customs Deputy, who completes all documentation before the shipment leaves the docks. The services of a Customs Broker are still required in this case, but the Broker's role is diminished. See Graham and Méndez (1997), 34.

<sup>14</sup>Shipments exceeding \$1,000 in value.

<sup>15</sup>Mexican national.

<sup>16</sup>NAFTA provides for national trucks to travel freely within the NAFTA block, beginning in January 1996, but organized labor has blocked the implementation of this law: Mexican drivers fear harassment by U.S. lawmakers, while U.S. drivers are wary of Mexican roads and bandits. See Graham and Méndez (1997), 16.

13.1%,<sup>17</sup> while the proportion of imported goods facing quotas fell from 87% in 1984 to 10% in 1992.<sup>18</sup>

Another aspect of the trade maximizing process included a concerted effort to improve the efficiency of customs administration and processing procedures. The customs system was reorganized during the Salinas administration: the General Customs Administration was given more autonomy in the determination of norms; those at the border were empowered to interpret these norms and regulations individually; new operation manuals were published, as well as a new regulatory decree (*reglamento*), in 1990. The Customs Brokerage industry was opened to competition to encourage efficiency, and the salaries of customs officials was increased to discourage corruption.<sup>19</sup>

In order to improve the efficiency and speed of customs processing, the paperwork requirements were incorporated into a computerized system. (This system is most complete at the Laredo/Nuevo Laredo/Colombia port.) Before the shipment reaches the bridge, the customs Broker fills out and submits the documentation electronically, and duties are deposited electronically to the designated bank account.<sup>20</sup>

Before the modifications, every vehicle stopped, paid duties and submitted documentation, and was questioned. Any suspicious cargo was inspected. This resulted in long lines at all the bridges. To alleviate the congestion, a stop-light system was implemented in conjunction with the computerized documentation. Upon reaching the customs dock, the forwarder presents the shipment's documentation and activates the light, which shows either green (pass) or red (inspect). Under this system only one in ten vehicles is required to stop for inspection, with the exception of certain high-risk goods categories, and also leaving the customs official the discretionary option to signal the red light for any vehicle that seems suspicious.<sup>21</sup> A vehicle receiving a green light is free to pass customs, being stopped again only at the end of the free border zone. Under the new system, any shipper found guilty of infraction against Customs Law faces a much higher penalty than before.

Any vehicle receiving a red light must move into the inspection area, where the cargo is inspected in detail by the Fiscal Police (customs agents). This usually involves opening random boxes to check them against the invoice, but may require that the entire cargo be unloaded, checked, and reloaded. Any detail in the paperwork—including

---

<sup>17</sup>Sources: SECOFI and U.S. Department of Commerce, In Pazos (1993), 314.

<sup>18</sup>Source: SECOFI, In Pazos (1993), 315.

<sup>19</sup>Graham and Méndez (1997), 11-12.

<sup>20</sup>For a more thorough description of this procedure, see Graham and Méndez (1997), 12-13.

<sup>21</sup>When the Customs Administration receives a tip that a problematic shipment is coming, the red light is activated for all shipments in that category for hours or days. See Graham and Méndez (1997), 17.

number of items, color, documentation, and labeling—that is not in order may result in further delays or a stopped shipment, as well as the possibility of a fine. If a vehicle passes this inspection, it proceeds to a second stop-light and goes through the same random process with a different inspection team. (The second checkpoint is managed by a private company, contracted by the government.) This two-light system is designed to increase the detection of corruption,<sup>22</sup> but it is possible for the various inspectors to communicate with each other. A third check may occur at the end of the free border zone. Again, there are cases of customs officials calling ahead to the border zone to ensure that a particular vehicle is allowed to pass.<sup>23</sup>

Any irregularity results in the shipment being seized and put into a Customs Administration storage facility. The broker, the Administration, and the head of the local Brokers' Association meet to determine the facts and any applicable fine. If an agreement is not reached, the matter goes to the courts.<sup>24</sup> Due to the variety of conflicting *reglamentos*, it is not difficult for a determined official to find an irregularity in the paperwork.

The opportunities for bribery before NAFTA were of both types: in order to evade taxes, and to avoid delays or paperwork. It is feasible that customs officials may have created queues to extract bribes, but the incentives for tax evasion were higher, so that queues may not have been necessary.

In 1992, the bridge and modern customs facilities at Colombia were opened up, providing a source of competition for the Nuevo Laredo facilities. This competition, theoretically, reduces the opportunity for bribes at both sets of bridges. Due to its distance from the Pan-American Highway, the facility has, in fact, had to exhibit higher efficiency of processing in order to justify deviation from the more-traveled path.<sup>25</sup>

### ***The NAFTA Provisions***

NAFTA imposes restrictions on tariffs and non-tariff regulations. It also dictates specific changes to some of the laws in each country. This section describes some of the most important changes dictated by NAFTA.

#### ***Tariffs***

First and foremost, the tariffs on thousands of goods are to be reduced or eliminated. Mexico was required to eliminate the tariffs on 5,900 categories of goods

---

<sup>22</sup>Graham and Méndez (1997), 17-18.

<sup>23</sup>Anonymous personal interview, 04/02/97.

<sup>24</sup>Graham and Méndez (1997), 18.

<sup>25</sup>Colombia Port Mexican Customs Administrator, personal interview, 03/97.

immediately, 2,500 more after five years, 3,300 after ten years, and finally, after fifteen years, the tariffs on corn (maize) and beans (frijoles).<sup>26</sup>

*Rules of Origin (Chapter 4)*<sup>27</sup>

In order for a good to be considered originating in the NAFTA region, materials from outside the region included in the final good may constitute no more than seven percent of the value of the good (Article 405), except for automobiles (Article 403), some food products (Article 405.3), spare parts (Article 407), indirect materials (Article 408), and packaging materials (Articles 409, 410).

*Certificate of Origin (Chapter 5)*<sup>28</sup>

Any good imported from one NAFTA country into another must be accompanied by a Certificate of Origin (CoO), unless the value of the good is less than \$1,000 (or a higher amount specified by the importing country) or unless this requirement has been waived for that type of good (Article 503). The CoO must be completed by the exporter. (The producer is not obligated to provide the exporter with a CoO; Article 501.4.) It is valid for four years, but the exporter is required "to notify in writing all persons to whom such certificate was given of any change that could affect its accuracy or validity." (Article 501.5b; also Article 504d.) In addition, any exporter or producer (if that producer provided a CoO to the exporter) in a NAFTA country is required to provide, on request of its own customs administration, a copy of the CoO for the goods it exports (Article 504a). False certification is punishable under the customs laws of the home country (Article 504b), unless written notification is voluntarily given to all persons who received the incorrect certification (Article 504e). The CoO may be verified through written questionnaires to the exporter, visits (by consent) to the production or export facility, or other means agreed to by the signatory countries (Article 506).

The possibilities for bribery surrounding this provision include: to falsely report that a Certificate of Origin was presented; to allow goods not meeting the country-of-origin requirements to pass with a Certificate of Origin; to allow goods to be undervalued, so that they may be exempted from the required Certificate, as provided in Article 503. These operations require the cooperation of the Customs Broker, who may charge a fee (a legal kind of bribe) for this special service.

*Standards-Related Measures (Chapter 9)*<sup>29</sup>

---

<sup>26</sup>Source: SECOFI, In Pazos (1993), 320.

<sup>27</sup>NAFTA text, <http://the-tech.mit.edu/Bulletins/Nafta/04.origin>.

<sup>28</sup>NAFTA text, <http://the-tech.mit.edu/Bulletins/Nafta/05.customs>.

<sup>29</sup>NAFTA text, <http://the-tech.mit.edu/Bulletins/Nafta/09.standard>.

Although each country is granted the right to adopt measures to protect its environment, consumers, and safety (Article 904.1), Article 904.4 prohibits the creation of "any standards-related measure with a view to or with the effect of creating an unnecessary obstacle to trade between the Parties." Any change in regulations must be published at least sixty days prior to its implementation, except for those relating to perishable goods, which should be published at least thirty days before implementation (Article 909.1).

### ***Post-NAFTA Regulations***

"In Mexico, customs administration has focused historically on restricting excessive importation and suppressing contraband."<sup>30</sup> Given that tariffs were reduced by NAFTA, the only way for the Mexican government to fill its historic role in customs administration has been through non-tariff regulations (despite Article 904.4). Many of the post-NAFTA changes have been heralded as efficiency-improving moves that, furthermore, demonstrate that Mexico deserves to be on the same playing field with the United States and Canada. Often these regulations are more stringent than those applied in either of these other countries.

In the wake of NAFTA, the customs system underwent further modification, culminating in the publication of a new customs law, effective April 1, 1996.<sup>31</sup> This law stipulates in close detail the responsibilities of the customs brokers and trans-shippers. In accordance with this law, imports must be accompanied by: a permit (*pedimento*), the commercial invoice; the validated (by the shipping company) loading document (for maritime transportation) or air waybill (for air transport); documentation proving compliance with any non-customs import regulations stipulated in the Official Daily Federal Register (*Diario Oficial*); documentation of the origin of the goods for the purposes of customs preferences, anti-dumping duties, quotas, or country of origin stamps; a document of guarantee when the value declared is less than that estimated by the Secretariat; and a certificate of weight or volume, which is issued by a company authorized for such certification. In addition, the serial number, part number, make, and model of any parts that may be individually identified must be supplied to the customs authorities, on any of the aforementioned documents or as a separate list, making reference to the permit number, and signed by the importer or the customs broker.<sup>32</sup>

In addition to the Certificate of Origin stipulated in the NAFTA, Mexico introduced a Survey Certificate (*Certificado de Encuesta*). This certificate is provided, for a fee, by

---

<sup>30</sup>Graham and Méndez (1997), 2.

<sup>31</sup>Graham and Méndez (1997), 13. Also Gantz (1996), 3.

<sup>32</sup>Gantz (1996), 13-14.

any of a number of companies offering the service, which includes visiting the plant specified on the Certificate of Origin to verify that the product is, indeed, produced there. The average cost for this Certificate is one per cent of the invoice value.<sup>33</sup>

In March 1997, a labeling regulation previously written was enforced suddenly (overnight). This regulation requires the packaging of all imported goods to be translated into Spanish, in the same size type as the original language, down to the ingredients (for edibles) and the exporting and importing companies. This represents an enormous cost, especially for small importers. Previously, a sticker bearing the merchandise type, importer, and exporter was placed inconspicuously somewhere on the imported item at little cost.<sup>34</sup>

These new non-tariff regulations open up a bounty of opportunities for customs officials whose bribes might have been reduced by lower tariffs. Not only do they impose costs on importers, they also leave sufficient room for interpretation that any ambitious customs official can always find something wrong, even when the manifests are prepared by the local Customs Administration.<sup>35</sup> In fact, one importer confirmed that problems with the Certificate of Origin are not uncommon.<sup>36</sup>

### ***Corruption in Mexico***

La corrupción tiene en México un continuo histórico, un hilo conductor que viene de muy atrás, de los vestigios combinados de nuestra civilización india, mestiza y criolla. Se manifiesta de múltiples maneras, unas ominosas y otras benignas; está en los actos más ruines de nuestros gobernantes y en los gestos más solidarios de la sociedad; el abuso del poder para fines de lucro, el tráfico de influencias, la "transa", se manifiestan en la ambición y soberbia de las autoridades, lo mismo que en la camaradería de los compadres y la solidaridad de los parientes; forma parte de las grandes decisiones públicas y también de las infinitas transacciones privadas.<sup>37</sup>

Corruption in Mexico is a social institution with a long history. It is so ingrained that, although "the Mexican government has committed itself to the fight against corruption..."<sup>38</sup> it is impotent in the face of political and personal opposition in all strata of society. Indeed, in the strictest sense of the word, *corruption* is not an accurate description of the payments that are made in the customs procedures, for these are payments that are

---

<sup>33</sup> Anonymous personal interview, 04/97.

<sup>34</sup> Anonymous personal interviews, 03/97 and 04/97.

<sup>35</sup> Graham and Méndez (1997), 18.

<sup>36</sup> Anonymous personal interview, 03/97.

<sup>37</sup> Zinser (1996), 85.

<sup>38</sup> *La Jornada* 30 March 1995, <http://serpiente.dgsca.unam.mx/jornada/1995/950330/brook.html>

*dictated* by (not breaking with) tradition and social norm.<sup>39</sup> Indeed, while a customs official is required by law to see that the regulations are met, I was unable to find a law prohibiting any payment to a customs official by an individual or firm.

### *Mexican Customs*

It is commonly asserted that "corruption is arguably due to the low wages paid to the rank and file employees in the Mexican customs administration...."<sup>40</sup> While wages may be a contributing factor, they are most likely a minor consideration in the case of Mexican customs officials, as will be demonstrated in Appendix I.

The incidence of corruption varies from one port to another: "institutional traditions, reinforced by geographic location, [are] an important explanatory factor in accounting for customs procedures in Tamaulipas. In contrast, Chihuahua and Nuevo Leon's actors tend to follow more modern patterns and have been much more flexible in permitting alternative ways of getting goods into and out of Mexico. In the latter case, unions tend to be less corrupt."<sup>41</sup>

The observation of changes in corruption levels in the Mexican customs service is complicated by several factors. First, the incidence of "irregularities" detected is, itself, a function of the flow of goods across the border. As more trucks enter Mexico, it is expected that more shipments per day will have some errant detail in the paperwork. This is, in fact, what has been observed.<sup>42</sup> The number of irregularities per shipment (or per thousands of shipments), however, is a variable that seems to elude officials on both sides of the border.

Second, trade liberalization and other, related policies began as early as 1991: "free trade" effects are not entirely cut-and-dry. The bridge at Colombia was opened in 1992, but only slowly developed the infrastructure and personnel necessary for it to realize its full potential. By early 1997, the formerly absent banks had been installed and the initial difficulties with licensing brokers<sup>43</sup> had been overcome.

---

<sup>39</sup>"La palabra corrupción viene del vocablo latino *rumpere*: romper, quebrantar un principio, una ley, una norma, un valor. En México la corrupción ha llegado a ser tan integral y abarcante, tan ilimitada que si bien constituye un gravísimo quebranto social, ocurre de maneras tan sagaces que en muchos ámbitos no es ya la transgresión a la norma, sino la consecuencia perversa de su cumplimiento. En efecto, en México se puede ser infinitamente deshonesto dentro de los confines de la ley; se puede robar legalmente, lícitamente." Zinser (1996), 87.

<sup>40</sup>Graham and Méndez (1997), 37.

<sup>41</sup>Graham and Méndez (1997), 45.

<sup>42</sup>Assistant Administrator of Nuevo Laredo, personal interview, 3/97.

<sup>43</sup>See Graham and Méndez (1997).

Third, within a year after NAFTA took effect, Mexico entered a deep economic crisis, with strong repercussions in cross-border trade. With the devaluation, the Mexican market shrank and imports to Mexico dropped considerably, including imports of contraband goods, while exports soared. Since the market for contraband diminished, the rather immediate effects observed should be a decrease in extortion, as a direct result of the reduced number of illicit shipments.

Lastly, a high-profile anti-corruption campaign has been undertaken by the Mexican government. This campaign has included replacing the old, entrenched personnel with new, young teams<sup>44</sup> who have been indoctrinated with a high-productivity mentality. These new teams at least put on a show of combating corruption and being proud of the cleanliness and transparency of their operations. Furthermore, they profess ignorance about the levels and types of corruption that existed before NAFTA. Another facet of the campaign has been a publicity campaign including posters at customs offices and booths, providing a central telephone number (in Mexico City, with a toll-free number for other parts of the country) for the registration of complaints against customs personnel. (See Figure 2.) This number has been posted since Spring of 1996. As a result, the number of denouncements must have grown in 1996-1997, independent of the level of corruption: Customs personnel face the very real possibility of false accusation.<sup>45</sup>

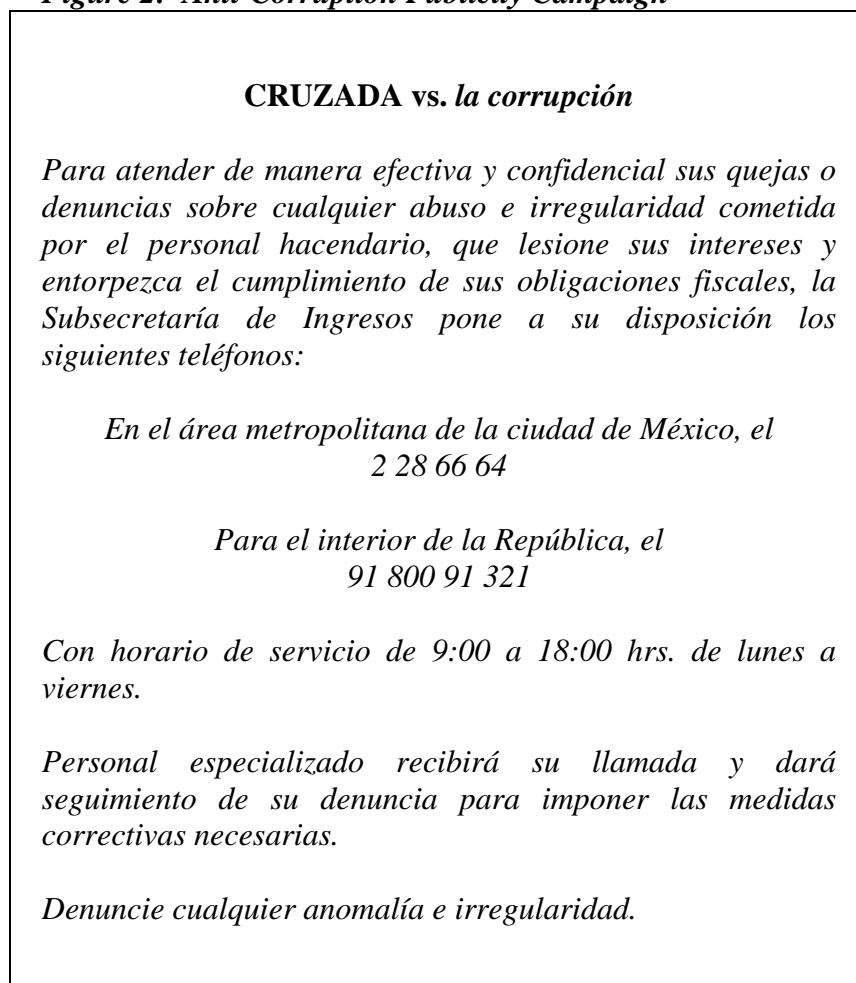
In sum, the change in observed corruption levels due to NAFTA will be exacerbated by the anti-corruption efforts and the increase in trade, diminished by pre-NAFTA trade liberalization and the Mexican crisis, and confounded by the new personnel's professed ignorance.

---

<sup>44</sup>The average age of administrative team members and customs officials (*policía fiscal*) is less than thirty. Personal interview, 03/97.

<sup>45</sup>An anonymous *policía fiscal* claims to have been falsely accused four times in the past year. Personal interview, 3/97.

**Figure 2: Anti-Corruption Publicity Campaign**



Source: Poster at the "Aduana Vieja" in Nuevo Laredo.

#### **IV. ECONOMETRIC MODEL**

Despite growing interest in corruption among economists, very few econometric studies have been published,<sup>46</sup> leaving corruption to the theorists only. The principal reason for the lack of empirical articles is that the only data "available" are subjective indices which rank countries according to the responses of interested parties (usually multinational investors) on surveys. Transparency International offers one such survey. Their disclaimer is as follows: "Keep in mind, that all surveys measure corruption by gathering data about the subjective perception of corruption. This is due to the fact that objective data about corruption cannot be obtained."<sup>47</sup> Such data does, however, exist. I have designed a model to use objective, quantitative data in the determination of the factors that influence the

<sup>46</sup>One notable exception is Mauro (1995).

<sup>47</sup><http://www.gwdg.de/~uwvw/icr.htm> 13 April 1997.

monetary value of a given bribe. This model may be useful for a government agency interested in reducing corruption by making it less lucrative (by reducing the average bribe amount) rather than through overt enforcement. With this model, we can begin to identify those variables whose modification will most affect bribe levels in Customs Administration.

### **Data**

This model is designed for use with court records of cases resulting in convictions of customs officials for bribery. Such cases should contain the details of the crime, including the amount of the bribe, the type of merchandise involved, the date, the port of entry, and the importer who either paid the bribe or reported attempted extortion. The other variables necessary can be derived from the type of merchandise and the date.

Alternatively, the data could be obtained from a survey of importers, cross-border transporters, and Customs Brokers, if these agents know very well the standard bribe for different kinds of merchandise and service, or if they keep records of bribes and allow access to those records. An exit survey of cross-border transporters (just after passing customs) would be ideal, but possibly infeasible due to the time constraints these face.

### **Model**

The basic model is as follows (all lower-case letters represent variables in logarithmic terms):

$$b_{i,pym} = w_{i,pym} + g_{pym} + t_{pym} + X \quad (1)$$

where the following definitions are used:

- $b$  (log of) bribe accepted or demanded by the individual
- $p$  port (identifier)
- $y$  year (identifier)
- $m$  month (identifier)
- $w$  (-) wage received by the official ( $i$ ) or on average at the port in the month and year of the bribe ( $pym$ )
- $g$  (-) government outlays either locally or nationally for combating corruption (spending on monitors and a central phone number for reporting irregularities)
- $t$  (+) tariff (rate) applied to the merchandise
- $X$  vector of dummy variables, including:

- R* (+) merchandise that must be inspected by law (red light goods)
- CO* (+) Certificate of Origin regulation in effect
- CE* (+) Certificado de Encuesta regulation in effect
- SIC* vector of two-digit Standard Industrial Classification industry dummies<sup>48</sup>
- L* (+) labeling regulation in effect
- C* (+) contraband goods
- D* (?) domestic importer<sup>49</sup>

The expected sign of each coefficient is given in parentheses. These are based on economic and sociological theory. The most important variables from the policy maker's viewpoint are those which are controlled by policy: the wage rate, government outlays, tariffs, and the various non-tariff regulations. The sign of each of these is almost purely intuitive: anything that raises the cost of importing also raises the bribe the importer is willing to pay. More instructive than the sign, however, will be the magnitude of each coefficient, for these will indicate the policy variables to which bribes are most responsive. Since the entire function (except the dummies) is in logarithmic terms, the coefficients represent the elasticities of bribes with respect to the explanatory variables. A higher (lower) absolute value of a coefficient means that bribes are more (less) affected by the variable in question.

It may be desirable to test for fixed port effects to identify ports to target for enforcement. In addition, fixed month effects may indicate months in which to be on special alert, while fixed year effects may (or may not) verify an exogenous improvement over time in the level of bribes, a change in informal institutions.

## V. CONCLUDING REMARKS AND EXTENSIONS

The purpose of this paper was to study the relationships between tariff and non-tariff restrictions on trade and the equilibrium bribe and level of corruption in Customs Administration, using the Mexican Customs Administration as a case study. Due to lack of data, the hypotheses—tariffs and non-tariff regulations are positively related to bribes—could not be tested. Nevertheless, the theory elaborated here supports the hypotheses.

---

<sup>48</sup>This assumes homogeneity of industries, an assumption that is far from the truth; however, the inclusion of these dummies allows us to discover how much of a bribe is due to goods belonging to a certain broad industry. The results may show this effect to be negligible.

<sup>49</sup>This dummy is intended to reveal any discrimination between domestic importers and multinationals.

## **Extensions**

This work, and the study of corruption in general, would benefit greatly from a more thorough, quantitative survey of those involved in customs: the importers, brokers, and trans-border carriers, in particular. (It is not immediately clear which of these bears the direct costs of extortive bribery; ultimately, the costs are passed on to the consumer.) This might lead to an analysis similar to, but more profound than, that carried out by Winston (1979) in the case of investment decisions in Nigeria. It might also provide sufficient data—if such data can be deemed reasonably accurate—for an econometric study of the sort proposed in Section IV of this paper.

The econometric model, itself, might be improved by specifying supply and demand equations to be estimated simultaneously, rather than the log-linear single-equation model proposed here.

The Mexican Customs Brokers exercise monopoly power over the import of goods into Mexico. It is quite possible that here lies the key to discovering corruption: a broker may bribe the customs official and bury the cost of bribes in prices. Even so, the heavy competition between Mexican Brokers since the new regulations has reduced Brokers' fees; equilibrium bribes should also be reduced, according to the logic developed in Section IV. If data could be obtained from the Brokers' Association on brokers who lost their licenses for engaging in illegal behavior, it could be a rich source.

## REFERENCES

- <http://serpiente.dgsca.unam.mx/jornada/1995/950330/brook.html> (*La Jornada* 30 March 1995)
- <http://the-tech.mit.edu/Bulletins/Nafta/04.origin>.
- <http://the-tech.mit.edu/Bulletins/Nafta/05.customs>.
- <http://the-tech.mit.edu/Bulletins/Nafta/09.standard>.
- <http://www.gwdg.de/~uwvw/icr.htm>, 13 April 1997.
- Aguilar Zinser, A. 1996. "El compromiso de combatir la corrupción", in *Los Compromisos con la Nación*. Mexico, Plaza & Janes.
- Alam, A.S. 1990. "Some Economic Costs of Corruption in LDCs," *Journal of Development Studies* 27,1 (Oct. 1990): 89-97.
- Graham, L. S. and J. L. Méndez. 1997. "Customs Administration Systems in Mexico and the United States: A Comparative Study". Mimeo, University of Texas.
- Gantz, D.A., ed. 1996. *Mexican Customs Law and Regulation (translation of Mexico's Ley Aduanera & Reglamento de la Ley Aduanera)*, Francisco A. Laguna, J.D., trans. National Law Center for Inter-American Free Trade.
- Lui, F. 1986. "A Dynamic Model of Corruption Deterrence." *Journal of Public Economics* 31: 215-236.
- Mauro, P. 1995. "Corruption and Growth," *Quarterly Journal of Economics* 110: 681-712.
- North, D.C. 1990. *Institutions, Institutional Change and Economic Performance*. Cambridge University Press, Cambridge.
- Palifka, B.J. 1997. "The Persistence of Corruption: A Labor Market Approach." Mimeo, University of Texas.
- Pazos, L. 1993. *Libre Comercio: México-E.U.A. Mitos y Hechos*, Bilingual Ed. Mexico: Editorial Diana.
- Shleifer, A. and R.W. Vishny. 1993. "Corruption." *Quarterly Journal of Economics* 108: 599-617.
- Theobald, R. 1990. *Corruption, Development and Underdevelopment*. Macmillan, London.
- Winston, G.C. 1979. "The Appeal of Inappropriate Technologies: Self-Inflicted Wages, Ethnic Pride and Corruption". *World Development* 7: 835-845.

## **APPENDIX I. GAME THEORY AND EQUILIBRIUM DETERMINATION OF BRIBE AND LEVEL OF CORRUPTION (INCOMPLETE)**

I consider a four-tier game, in which the principal actors are the importer, the customs official, his supervisor,<sup>50</sup> and the federal government. The decisions and incentives of each actor are given below. The game has three steps, in the following order: first, the government decides on a policy or regulation; then the importer and the official jointly decide whether a bribe changes hands; finally, the supervisor observes the transaction with probability  $\Phi$  and decides whether to enforce the government policy or demand a bribe from the official involved.

We will consider the incentives involved in each decision in turn.

### ***Federal Government***

The federal government wants to maximize tax revenue less costs.<sup>51</sup> This involves a delicate balance between tariffs and the volume of imports that pay those tariffs. As we shall see, taxes are a cost to the importer and affect his decisions. If tariffs are set too high, imports may cease to be profitable, causing the volume of imports to decline. The passing of trade agreements effectively puts a "cap" on tariffs for some goods from certain countries. The NAFTA goes to the extreme of completely eliminating tariffs on many goods between the three signatory countries. For simplicity, I consider an economy with two import goods: one subject to a tariff maximum, the other free of any restrictions on tariffs.

The costs involved in customs are labor costs: wages paid to the customs official and to the supervisor. The government may also be under international pressure to provide concrete evidence of running a "clean" administration. In Customs Administration, this may be accomplished by, for example, the installation and maintenance of monitors at the customs gates; the conspicuous posting of official anti-corruption policies; and the establishment of an apparent means to legal recourse.<sup>52</sup> I will consider spending on combating corruption in customs to be a deduction from the customs generated, in order to retain the problem within Customs itself. The government's problem may be written as:

---

<sup>50</sup>There may be, in reality, several levels of supervisory hierarchy, but these may be abstracted to a single level with no loss of generality.

<sup>51</sup>The individual(s) in office may face the additional, contradictory, incentive of maximizing individual wealth. I abstract from this incentive, allowing it to be captured in the supervisor's decision.

<sup>52</sup>For an example of this in the Mexican case, see Figure 2, above.

$$\max_{t, \tau, w, W, S} tm + \tau\mu - w - W - S \quad (3.1)$$

$$\text{subject to} \quad t \leq t_{\max} \quad (3.2)$$

$$S \geq S_{\min} \quad (3.3)$$

where  $t$  is the tax rate applied to treaty-negotiated imports ( $m$ );  $t_{\max}$  is the treaty-imposed maximum tariff;  $\tau$  is the tariff on import goods excluded from trade negotiations ( $\mu$ );  $w$  is the wage paid the customs official;  $W$  is that paid to the supervisor;  $S$  is spending on combating corruption; and  $S_{\min}$  is the minimum level of spending required to avoid trade sanctions. Further restrictions on the government maximization problem are the reaction functions of each of the other agents, to be developed below.

### ***Importer***

The importer wants to fulfill any of several goals: profit maximization or capturing market share are the most common and most tangible. Since market share translates into future profits, we lose no generality by equating "maximization of the present value of future profits" with "profit maximization": although the former may imply a current-period net loss for the importer, the present value of expected future gains is positive. For each shipment, then, the importer expects to gain a certain level of (current and/or future) profit. In the absence of legal sanctions, this is the maximum amount the importer is willing to sacrifice in the form of a bribe.

Importers include a wide variety of economic agents, including wholesalers, retailers, restaurants, manufacturers, processors, and governments of various levels. For this discussion, I consider the simple case of a retailer, whose decision process is parallel to those of the other types of importers. The goods imported depend mainly on the kind of industry in which the importer is involved, but to a certain extent even that may be adjusted over time, so I include the choice of importing the restricted-tariff good or that with the unregulated tariff. The importer may also have the option of purchasing local goods: indeed, one of the goals of the government in setting high tariffs may be to foment economic growth by giving local industries a price advantage over imports.

The importer's problem is<sup>53</sup>:

$$\max_{m, \mu} \{Pm - c(m) - tm - b, \Pi\mu - \gamma(\mu) - \tau\mu - \beta\} \quad (3.4)$$

$$\text{subject to } b \leq Pm - c(m) - tm \quad (3.5)$$

$$\beta \leq \Pi\mu - \gamma(\mu) - \tau\mu \quad (3.6)$$

In the absence of bribes, the first order condition shows us that the importer sets marginal costs equal to after-tax profit; for the free trade good:

$$c'(m) = P - t \quad (3.7)$$

### ***Customs Official***

The customs official desires to maximize his own expected lifetime income, given that he may be detected in corrupt activities. In the case of detection, he may be forced to relinquish part or all of the bribe to his supervisor; he may be fired; he may be forced to pay a fine in excess of the bribe. His utility maximization problem, depending on the type of merchandise,<sup>54</sup> is given by:

$$\max_{\beta} \sum_{t=0}^T \delta^t w_t + (1 - \phi)\beta_t - \phi\chi \quad (3.8)$$

or

$$\max_b \sum_{t=0}^T \delta^t w_t + (1 - \phi)b_t - \phi\chi \quad (3.9)$$

where  $\delta$  is the probability of staying in the same job next period (this may or may not be equal to  $(1-\phi)$ );  $\phi$  is the probability of being detected by the supervisor;  $w$  is the wage paid each period;  $\beta$  or  $b$  is the bribe; and  $\chi$  is the cost imposed when detected accepting a bribe.

---

<sup>53</sup>If bribes depend on the value of the merchandise, then  $b$  and  $\beta$  are replaced by  $b(m)$  and  $\beta(\mu)$ , respectively.

<sup>54</sup>See note 51.

In a given period, the customs official will accept a bribe if and only if the "expected bribe" (the bribe multiplied by the probability of escaping detection) exceeds the "expected punishment",<sup>55</sup> for example:

$$\text{accept } b \text{ iff } (1-\phi)b \geq \phi\chi$$

*(Tie this in with the importer's decision: the optimal bribe and imports are decided simultaneously.)*

### ***Supervisor***

The supervisor wants to maximize his own lifetime income, subject to remaining in his position. He may be under pressure to enforce the government policy by detecting and reporting a minimum number of offending customs officials each period but, otherwise, is free to extract a bribe from corrupt officials he observes. His problem may be written:

$$\max_{\phi, \chi} \sum_{t=0}^{\omega} \alpha^t W_t + \eta \phi \chi \tag{3.10}$$

---

<sup>55</sup>This abstracts from the possibility of losing the job.

## APPENDIX II. ESTIMATING THE PROPORTION OF CORRUPT OFFICIALS (INCOMPLETE)

Many of the theoretical models on the persistence of corruption concentrate on the percentage of employees who choose to be corrupt. Yet such data, to the best of my knowledge, does not exist. In this Appendix, I outline a method for calculating the percentage of employees who are corrupt, based on convictions. This may be used with data on customs officials or brokers who lose their licenses for corruption.

The number of employees convicted consists of those who are corrupt, caught, and convicted, plus those who are not caught, falsely accused, and unjustly convicted. In probabilistic terms:

$$\begin{aligned} \# \text{convicted} &= \# \text{employees} [\text{Pr}(\text{corrupt}) \text{Pr}(\text{caught} | \text{corrupt}) \text{Pr}(\text{convicted} | \text{caught, corrupt}) \\ &+ \# \text{employees} [1 - \text{Pr}(\text{corrupt})] \text{Pr}(\text{caught} | \text{not corrupt}) \text{Pr}(\text{convicted} | \text{caught, not corrupt}) \end{aligned}$$

We can construct a "conviction rate" by dividing both sides by the number of employees:

$$\begin{aligned} \text{conviction rate} &= \# \text{convicted} / \# \text{employees} \\ &= [\text{Pr}(\text{corrupt}) \text{Pr}(\text{caught} | \text{corrupt}) \text{Pr}(\text{convicted} | \text{caught, corrupt}) \\ &+ [1 - \text{Pr}(\text{corrupt})] \text{Pr}(\text{caught} | \text{not corrupt}) \text{Pr}(\text{convicted} | \text{caught, not corrupt}) \end{aligned}$$

The probability of being caught is a function of government outlays, supervisor's incentives, etc.:

$$\begin{aligned} \text{Pr}(\text{caught}) &= \varphi(\text{gov't outlays, incentives}) \\ \text{Pr}(\text{corrupt}) &= f(\text{wage, government outlays, incentives, bribe}) \end{aligned}$$