TRADE PROTECTION AND BUREAUCRATIC CORRUPTION: AN EMPIRICAL INVESTIGATION

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Abstract

We examine whether protectionist policies on the part of the government leads to increased bureaucratic corruption. Using multiple measures of corruption and trade policies, we find strong evidence that corruption is significantly higher in countries with protectionist trade policies. These results are robust to endogeneity concerns. Next, a panel-data based GMM methodology is used to estimate a dynamic model of corruption. This estimator controls for country-specific effects, potential endogeneity of trade policy, and existence of measurement errors afflicting the corruption data. The paper strengthens the case for trade liberalization and argues that trade reforms may lead to improvements in governance.

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1 Introduction

Trade policies have long played a significant role in the development strategies of many countries. It is widely accepted, not least in the agreement establishing the World Trade Organization, that the purpose of the world trade regime is to raise living standards all around the world, and not to simply maximize trade per se. The two primary development strategies in the 1950s - import-substituting industrialization and export promotion - both included a strong trade policy component. Export pessimism led many developing countries to choose import-substituting industrialization, where domestic industry was encouraged and shielded from international competition by highly protectionist trade barriers. On the other hand, the experience of the East Asian tigers is presented as one of export-led growth, with liberalized trade policies facilitating industrial diversification and technological catch-up.

More recently, a consensus seems to be emerging that the deeper determinants of economic development are not policies (trade policies as well as macroeconomic policies) but the underlying institutions in a country. Institutional indicators such as the rule-of-law, the legal and political system, and bureaucratic corruption have been shown to have a much more significant impact on economic growth and level of development (Mauro, 1995; Hall and Jones, 1999; Rodrik et al, 2004; Easterly, 2005). The emerging verdict of the primacy of institutions over policies (see Rodrik et al, 2004) while illuminating, may be of little comfort to policymakers who have much less flexibility when it comes to institutional reform.

In this paper we focus whether trade policies can have a significant and robust impact on one aspect of institutions - bureaucratic corruption. This link between trade reforms and construction of a high-quality institutional and governance structure has been emphasized by Rodrik (2000). He argues that trade reforms are more than a simple change in relative prices; it results in institutional reforms as well, and this is perhaps the major criterion by which such reforms should be evaluated. In this paper we show that protectionist trade policies lead

to an increase in bureaucratic corruption. If we believe that protectionist policies are welfare enhancing, the indirect welfare-reducing effect of protection induced corruption could temper or even compromise the goals of trade policy. Alternatively, if one believes in the emerging consensus that free trade promotes aggregate welfare, then the secular movement towards free trade across all countries since the 1990s will yield an additional benefit in terms of a reduction in bureaucratic corruption. Therefore, this paper strengthens the case for trade liberalization and weakens the case for protectionism. Countries characterized by a poor institutional and governance structure, can pursue liberalized trade policies as a means to and in parallel to fundamental institutional reforms.

Prior empirical papers on the determinants of corruption use $\frac{X+M}{GDP}$ or $\frac{M}{GDP}$ as a measure of openness. Examples include Ades and Di Tella (1997, 1999) and Treisman (2000). This is an indirect measure of trade restrictions and notoriously unreliable (Rodrik and Rodriguez, 2000). The question we address in this paper is: *Are countries with lower policy-induced barriers to international trade less corrupt, after controlling for other relevant country characteristics?* For governments struggling with pernicious level of corruption this is the question that is of direct policy relevance. To the extent that the we can demonstrate a positive causal link from trade policies to corruption, the relevant policy implication is that governments should consider dismantling their barriers to trade. Clearly, this question differs from an alternative one that seems to have been examined in prior empirical research: *Does the volume of international trade reduce corruption?* Trade policies do affect the volume of trade, of course. But there is a strong reason to expect their effect on corruption to be quantitatively (or even qualitatively) different from the consequences of changes in trade volumes that arise from, say, reductions in transport costs or fluctuations in world demand or world prices.[1]

Econometrically, there are two problems with relying on trade volumes as opposed to trade policies. Since many other variables affect trade volumes, there is a strong likelihood of mea-

surement error in the trade volume measure as a proxy for trade policies. This would lead to an attenuation bias in OLS estimates and could be responsible for Treisman (2000) finding that the effect of import volumes on corruption is surprisingly small. Trade policies' effects on corruption will also work differently from natural or geographical barriers to trade and other exogenous determinants that are subsumed in the trade volume measures.[2]Second, to the extent that trade restrictions can also be mechanisms for rent-extraction, endogeneity problems are likely to be severe. Treisman (2000) recognizes this causality problem but does not address them due to lack of instruments. This paper takes these problems seriously. It draws on the political economy of trade policy literature to identify instruments for trade policies in the cross-sectional results. It takes a panel data approach to this problem as well. There are various advantages to such an approach. First, this permits a rich model specification and allows us to control for historical country-specific variables. Second, since the tenacity with which corruption seems to persist is also well-documented, it allows us to capture the inertia inherent in institutions in general and corruption in particular. Finally, it allows us to deal with the endogeneity of various variables by using their lagged values as instruments. Accounting for these problems, this paper provides evidence for the existence of important spillovers between trade reforms and improvement in governance. We find strong support that protectionism engenders corruption - a result which is robust to the treatment of corruption as an ordinal measure, to endogeneity issues, and to variations in corruption over time and space.

The paper is organized as follows. Section 2 provides an overview of prior empirical work on corruption and the channels through which trade policies may affect corruption; Section 3 lists the data sources and provides descriptive statistics for the variables to be used in the empirical analysis; Section 4 discusses the cross-sectional results; Section 5 presents the results using panel data; Section 6 concludes.

2 Corruption and Trade Policies

Prior research has shown that corruption impedes long-term foreign and domestic investment by raising transaction costs and uncertainty in an economy (Wei, 2000), misallocates talent to rent-seeking activities, and distorts sectoral priorities and technology choices (Gray and Kaufman, 1998). It pushes firms underground (outside the formal sector), undercuts the state's ability to raise revenues, and distorts government expenditure (Mauro, 1998). The importance of good governance is also underscored by the inclusion of anti-corruption reforms in the 'augmented Washington Consensus' that seeks to create the institutional underpinnings of market economies.[3]

In view of these pernicious effects of corruption, multiple empirical studies have focused on the factors that promote corruption. Researchers studying corruption have found that bureaucratic wages, the degree of development, and historical factors such as Protestant traditions and British rule help mitigate corruption to a large degree (Serra 2004, Van Rijckeghem and Weder 2001, Treisman 2000). However, many governments, especially in developing countries, can take little comfort from these findings. History is immutable; increasing bureaucratic wages may not always be feasible; and a vicious cycle exists between the current level of development and corruption (low levels of GDP imply high levels of corruption, which in turn suppresses growth rates). One option for the government in such situations is to remove opportunities for rent-seeking by diminishing or eliminating rents by liberalizing international trade. This paper advances this line of argument by systematically investigating the effect of protectionist trade policies upon corruption.

The trade literature addressed the relationship between protectionism and corruption originally in the form of Krueger's (1974) analysis of rent seeking activities. She recognizes that government regulations are pervasive, and give rise to rents and rent-seeking, which may take the form of bribery and corruption. However, her analysis is mainly concerned with showing

that welfare losses with import quotas (that give rise to rent-seeking) are greater than losses under an equivalent tariff.[4]

Protectionist trade policies can affect corruption in a variety of ways. They can increase the propensity to pay bribes to bureaucrats by both domestic firms and foreign exporters. In a setting where each country produces differentiated products under monopolistic competition and engages in intra-industry trade, protectionist trade policies (e.g., tariffs, producer and export subsidies) increase the rents to domestic firms. In the presence of regulations such as licensing requirements (which provides bureaucrats with the opportunity to extract bribes) this leads to larger bribes. Since it is reasonable that the magnitude of bribes provides greater inducement for any bureaucrat to be corrupt, trade policies will manifest themselves in increased corruption.[5]However, this is not the only channel via which higher tariffs lead to a higher incidence of corruption. Where tariffs exist, there is an incentive for foreign firms (serving the domestic economy through exports) to evade them via smuggling, whether overt or in the form of invoicing changes.[6]Both of these can manifest themselves in the form of corruption - the former as bribes paid to law enforcement officials and the latter as bribes to customs officials. These incentives increase with the tariff rate so that as protection increases, this will lead to higher corruption.

A third channel that may also lead to rent seeking and corruption, is tariff destroying lobbying with the aid of bribes to politicians (See Bhagwati, 1982). A recent paper by Gawande, Krishna, and Robbins (2004) finds that the presence of a foreign lobby in the US significantly reduces tariff barriers and that an organized foreign lobby representing a particular industrial sector appears to have as much effect in lowering trade barriers against imports in that sector as does the presence of a domestic lobby in raising trade barriers there. Again, the higher the tariffs the higher will be the willingness-to-pay of firms upon whom the tariff is imposed to reduce or remove the tariff.[7]Finally, as Bhagwati and Srinivasan (1980) point out, there may

be a competition for securing a share in the disbursement of tariff revenue. While they model the process as a legal directly unproductive activity, the shares may be distributed in accordance to bribes paid by various interest groups. This provides an additional channel through which protectionist policies may impact corruption. Here, whether corruption is increasing in protectionist policies depends crucially upon the elasticity of import demand.

3 Data Sources and Some Basic Statistics

3.1 Corruption

We use two sources for data on the indices of corruption, both of which are based on surveys. The first measure is the *International Country Risk Guide* (ICRG), used previously and described in detail in Knack and Keefer (1993). Corruption is measured on a zero to six scale, where low scores indicate high levels of corruption. The second measure is compiled by *Transparency International* (TI). The TI index ranges from one (most corrupt) to ten (least corrupt), where lower scores indicate higher levels of corruption, and is itself an average of a number of survey results. We use the 2000 TI index of corruption. To avoid awkwardness in the interpretation of the coefficients, the ICRG was recoded as six minus the original corruption index, and the TI measure were recoded as ten minus the original corruption index, so that now higher numbers indicate higher corruption. The two indices of corruption are highly correlated with the correlation and rank correlation coefficient exceeding 0.8. Both these measures have been widely used in the empirical literature on corruption.[8]

Each measure has its advantages and disadvantages. ICRG index measures the likelihood that government officials are likely to demand special payments and that illegal payments are generally expected throughout lower levels of government in the form of bribes connected with import and export licenses, exchange controls, tax assessment, policy protection, or loans. This

comes closest to capturing corruption as we have conceptualized it here. The ICRG measure also has the most extensive coverage, across countries and over time (1984-2004). Since a single survey methodology is used, cross-country comparisons using this measure are likely to be valid. However, these are subjective assessments of corruption and subject to measurement error. More importantly, it is possible that survey respondents notice that a country is attracting trade and investment at a rapid rate and automatically give it a lower corruption rating. This could be potentially problematic. The TI measure as a "survey of surveys" with different respondents and survey methodologies is less likely to have this problem. The averaging procedure should also reduce measurement error if the errors in different surveys are independent. However, this measure is available only for a very few years so that we cannot construct a panel dataset that has a significant coverage over time within each country. The fact that different surveys are used across different years for averaging means that we would not want to use it as a dependent variable in panel estimates.

3.2 Trade Policies

Our objective is to use direct measures of trade protectionism rather than trade volumes used in prior work. Prior research on the relationship between trade protection and corruption has used two proxies for trade policies: trade volumes (ratio of total trade to GDP and imports to GDP) and the Sachs-Warner indicator variable for openness (Ades and Di Tella, 1999; Treisman, 2000; Leite and Weidmann, 1999). We have already argued at length that trade volumes are a distorted indicator of trade policies. The Sachs-Warner measure is even more problematic: it takes the value of zero if the economy is closed according to any one of the following criteria: 1. Average tariff rates exceeded 40%; 2. Non-Tariff barriers covered more than 40% of imports; 3. The country had a socialist economy system; 4. It had a state monopoly of major exports. 5. The black market premium on the exchange rate exceeded 20% during either the 1970s or

1980s. This measure has been criticized by Rodrik and Rodriguez (2000) on various grounds. Most importantly, the black market premium is more an indicator of macroeconomic imbalances and/or balance of payment crisis rather than trade restrictions. Further, the state monopoly of exports variable is virtually indistinguishable from a sub-Saharan African dummy because the World Bank study on the basis of which it was constructed covered African countries that were under structural adjustment programs. Therefore, the empirical results that use the Sachs-Warner measure may be questionable.

To ensure the robustness of our results, we use a variety of *direct* trade policy measures: total import duties collected as a percentage of total imports (IMPORT DUTY),[9]an average tariff rate calculated by weighing each import category by the fraction of world trade in that category (TARIFF),[10]a coverage ratio for non-tariff barriers to trade (QUOTA). Both TARIFF and QUOTA are from Barro and Lee (1993). We also use the TARIFF and QUOTA variables available for the 1990s from UNCTAD (see table 1 for more details). While none of these measures are perfect, Rodrik and Rodriguez (2000) argue that these are the most direct measures of trade restrictions, that there is little evidence for the existence of serious biases in these indicators and that they do a relatively decent job in ranking countries according to the restrictiveness of their trade regimes.

As a robustness check we also use two indirect measures of trade protection. First, we use the number of years since 1948 (the year GATT was founded) that country has been outside the GATT/WTO.[11]Membership in the GATT/WTO commits countries to liberalize trade mainly through reduction in tariffs and non-tariff barriers. However, the presence of Special & Differential treatment up until the Uruguay Round implies that many developing countries despite joining GATT/WTO were not required to reduce restrictions on trade. Despite this flaw, membership does signal a commitment to liberalize trade. Second, every country inevitably uses a wide range of policies (explicit protection as well as implicit protection through domestic policy

substitutes) to restrict trade. As a result, a perfect summary measure of trade policy is difficult to find. Hiscox and Kastner (2002) have attempted to address this shortcoming by creating an alternative measure of protection using the importing-country-specific and time-specific effects in the standard gravity equation. They measure the difference between the biggest dummy coefficient (among all the years and for all time periods) and the different country-specific, time-specific dummy coefficients and express it as a percentage of the predicted import to GDP ratio for each country under free trade to arrive at their measure of protection.

3.3 Other Variables

We use a measure for subsidies obtained from the World Development Indicators (2000) that measures all transfers from the Central government to private and public enterprises as well as consumption subsidies. With very little cross-country data on production and export subsidies, we are compelled to use this measure. Since producer and export subsidies are only a fraction of total subsidies, the magnitude of the effects must be interpreted with caution.

To account for checks and balances on bureaucrats, we use a number of variables that we can serve to check corruption. The first variable that we use is democracy. Democratic countries are likely to exercise pressure on politicians to keep corruption in check with the electorate punishing corrupt regimes at the voting booth. A dictatorial regime on the other hand is likely to be less sensitive to demands for controlling corruption through monitoring mechanisms and punishment schemes. For a measure of democracy, we use the Gastil index that provides a subjective classification of countries on a scale of 1 to 7 on political rights, with higher ratings signifying less freedom. The average for the 1980s is used. The other measures of checks that might act to check corruption are schooling and the number of newspapers per thousand of the population. Both increase the awareness of the public and create social pressures against corruption. The data on these measures are obtained from the World Development Indicators

(2000).

Using new data from the World Bank on civil sector wages for 86 countries, we construct a measure of relative civil-sector wages. First, we calculate real wages measured in constant 1997 dollars. Next we calculate the ratio of civil-sector to manufacturing sector wages by supplementing this data with the UNIDO dataset on manufacturing sector wages and employment.[12]This is necessary for cross-country comparability. Manufacturing wages may be thought as a proxy for outside option for bureaucrats (in case they are caught taking bribes and fired) since the skill-content in the manufacturing sector is probably lower than in the government sector, making it a suitable candidate for representing outside opportunities for the bureaucrat. High manufacturing wages make corruption more attractive to bureaucrats as they become more willing to assume the risks of detection.[13]

An important driver of corruption is the existence of licensing. This provides discretionary power to bureaucrats and thereby the ability to extract rents. Moreover, alternative channels could exist that promote corruption, such as distortion of wages and prices through price controls. Therefore, we use two other variables - an index of regulation that measures the licensing requirements faced by domestic firms in the economy and an index of wage and price regulation. The former measures the degree of licensing requirements to start new firms, as well as prevalent levels of labor, environmental, consumer safety and worker health regulations. Wage and price regulation, measures the degree to which the government controls wages and prices, through minimum wage laws and price controls. The data on these two measures is derived from the Heritage Foundation, 1998. To control for regional effects we use three dummies: an East Asia dummy, an oil dummy and a Sub-Saharan African dummy.

Table 1 provides summary statistics for these independent variables. Figure 1 plots the TARIFF measure for the 1990s against the ICRG measure for the year 2000 in levels; figure 2 plots the TARIFF and ICRG measures in first differences between the 1990s and 1980s. Both

plots indicate a positive relation between tariffs and corruption.

4 Empirical Results

4.1 OLS and Ordered Probit

We use both ordinary least squares and ordered probit methods. The surveys upon which our corruption measure is based, ask how likely it is that the respondent will encounter corruption. We can interpret the response in a probabilistic fashion giving it a cardinal interpretation justifying the use of OLS methods. However, if we believe that the corruption measures are simply a ranking and cannot be given a cardinal interpretation, an ordered probit model seems more appropriate.

In tables 2-5, we present the full regression results where all the regressors save bureaucratic wages are included. The reason for doing so is the small sample of countries for which consistent relative wage data are available. Each of the tables corresponds to a particular measure of corruption and a particular estimation technique.[14]

The first two columns of table 2 shows a positive and significant relationship between the ICRG measure of corruption and tariff rates. The first column uses the ICRG measure and tariff rates for the 80s while the second column uses the ICRG measure from 2000 and tariff measures from UNCTAD (2001). Both show that higher tariff rates lead to higher levels of corruption. Quotas have a positive and significant impact on corruption but only for the 1990s. For quotas in the 80s, not only are is the coefficient insignificant, they also have a wrong sign. This, we believe, is an artifact of the quota measures for the 1980s from Barro and Lee. This quota coverage ratio, as Harrigan (1993) points out suffers from measurement error problems due to smuggling, coding problems and weaknesses in the underlying data. Harrigan (1993) has found that for OECD countries both price and quantity NTB coverage ratios are, in most cases, not associated with

lower imports. He points out that these coverage ratios are the noisiest indicators of trade policy as there are severe problems with their construction procedure and are not even conceptually what would be desired.[15]Therefore, not surprisingly, in all our regressions, we fail to find any significant and precise predictors for the quota coverage ratio. The quota coverage ratio in 1999 from UNCTAD (2001) is a relatively accurate and carefully constructed measure and we obtain a strong and positive relationship with 2000 ICRG measure of corruption. Finally, import duties as a measure of protection is also strongly significant. These relationships are replicated in table 3 where we use an ordered probit estimation technique - once again, all measures of protection save quota coverage in the 1980s positively and significantly impact corruption. Thus, regardless of whether we give corruption a cardinal or an ordinal interpretation, the relationship between corruption and trade policies is strongly borne out by the data. A one standard deviation increase any measure of trade policy (tariffs in the 80s and 90s, quotas in 90s, import duties) all raise the ICRG measure by at least 0.2 points - it ranges from 0.22 in the case of tariffs in the 90s to 0.28 in the case of quotas in the 90s.

In tables 4 and 5, we use the TI measure of corruption. Table 4, which presents OLS estimates, shows that countries with higher tariffs in the 1980s and 1990s are also more corrupt by the TI measure. Non-tariff barriers in the 1990s also lead to higher levels of corruption. The quota measures for 1980s is insignificant as before and has the wrong sign while import duties has the right sign but is not significant. In the ordered probit estimates all measures of trade policies are strongly significant, apart from the quota measure from the 1980s. Here we find that a one standard deviation increase in the tariff measures (in the 80s or in the 90s) has a lower impact on corruption than an equivalent increase in non-tariff barriers (in the 90s) - the magnitude of impact is 0.34 in the case of tariffs while it is nearly double (0.67) in the case of quotas. So for the TI measure we find support for Krueger's (1974) contention that non-tariff barriers are likely to lead to more rent-seeking.[16]

Subsidies are strongly significant in all the regressions and have the predicted sign. This variable measures the degree of support to domestic economic agents - both consumers and producers and for this reason it does not coincide with trade related subsidies (such as export subsidies). Unfortunately, data on subsidies that makes such distinctions are not available at a national level for a cross national sample of countries. For this reason, we cannot calculate the exact magnitude of the effects of producer and export subsidies on corruption. A one standard deviation increase in the subsidy measure in table 2, raises the ICRG measure by slightly less than 0.2 points. Since export subsidies are only a fraction of our subsidy measure, the magnitude of effect of export subsidies is less than that of tariffs and quotas.

Some of the strongest results that we obtain are with respect to licensing - both statistically and substantively it strongly encourages bureaucratic corruption. This is not surprising, since licensing is a necessary condition for bureaucrats to exercise control and extract rents. This is also in accordance with Krueger (1974) who shows that import licenses are the biggest contributors to rents and rent-seeking activities in both India and Turkey. Wage-price regulation (another channel through which corruption might arise) is not a significant source of corruption, nor is schooling. Political liberty and the number of newspapers do better suggesting that the discipline of the ballot and the media act as a check on corruption.[17,18]Among the country dummies, no clear pattern is discernible though the dummy on East Asian countries has a positive and significant coefficient in a majority of the regressions. Perhaps this reflects the accusations of 'crony capitalism' often made in the context of East Asian countries.[19]

In table 6 we add relative civil sector wages to our regressions with ICRG as the dependent variable. In addition, we combine our measures of political rights, schooling and newspapers using principle component analysis to save on degrees of freedom.[20]For our measure of bureaucrat wages (relative to manufacturing sector wages) we find a negative relationship between civil sector wages and corruption though the strength and significance varies across model spec-

ifications. This finding is in line with the results of Van Rijckeghem and Weder (2001). More importantly, our previous findings of a strong link between trade policies is robust to the inclusion of this wage measure. Tariffs, quotas and import duties are significant as are subsidy rates and the principal component.

The models as a whole explain a significant proportion of corruption with an R^2 in excess of 0.7. Finally, in each of the models we are able to reject the hypotheses that the coefficients as a whole are jointly insignificant. Thus the empirical findings strongly support our prediction that direct measures of trade protection and promotion of national firms via subsidies tend to increase corruption. In addition, the relative wages in the civil sector, and proxies for checks and balances help explain a significant proportion of the variation in corruption across nations.

4.2 Two-Stage Least Squares

It is plausible that trade restrictions are endogenous with respect to corruption. Governments may choose an optimal amount of protection for the domestic industry through some welfare maximization exercise and recognizes that increased protection leads to an increase in corruption. In such a case the government would trade off the benefits of protection against the costs of corruption and both protection and corruption would be determined simultaneously. Moreover, protection may be endogenous, if bribes accrue to policy makers as well - the latter would then have an incentive to provide protection, since this provides opportunities for rent-seeking activities. Another source of endogeneity can arise if policymakers grant protection to domestic firms in exchange for bribes or campaign/political contributions. In the Grossman-Helpman (1994) model, if one interprets the weight that policymakers attach to social welfare (as opposed to contributions from lobbies) as inversely proportional to corruption then corrupt governments are likely to offer higher tariffs. All these sources of endogeneity imply that the OLS estimates may be biased. A second problem is that some of our trade policy variables may be prone to

measurement error (import duties for instance) which would again bias our estimates.

A popular instrument for trade volumes (as a share of GDP) in the literature is that of Frankel and Romer (1999). They estimate a gravity equation, where bilateral trade flows between country-pairs are regressed on geographic characteristics (countries' size, distance from each other, whether they share a common border, and whether they are landlocked). The fitted trade values are then aggregated across partners to create an instrument for the actual trade share. This instrument while widely used is less likely to be valid in this study. Geographic characteristics influence the quality of institutions through the historical experience of colonialism, migrations, and wars (see Acemoglu, Robinson and Johnson, 2001.) This in turn, can have an impact on corruption and governance in a country especially when corruption tends to be persistent.

Our choice of instruments is guided by the theoretical and empirical results from Dutt and Mitra (2005). The authors build on the political-support function approach, popularized by Hillman (1989) and Van Long and Vousden (1991) to consider how partisan interests (political ideology) play a role in the determination of trade policies. An important effect and sometimes an objective of trade policy is the redistribution of income from capital to labor or vice versa. The effect of an increase in the government's leftist ideology can be viewed as an increase in the weight placed by it on the welfare of individuals predominantly dependent on labor income relative to the welfare of those who mainly derive their income from capital ownership. This increase in the labor-welfare weight results in policies that are more pro-labor and that move the domestic terms of trade in favor of the labor-intensive sector. In a capital-abundant country, the labor-intensive good is the importable good and therefore, an increase in the leftist orientation of the government will result in a rise in import protection. In a labor-abundant country, however, the labor-intensive good is the exportable. Therefore, an increase in leftist orientation in such a country will result in a decline in import protection. The dependent variables in Dutt

and Mitra (2005) are tariffs, quotas and import duties (the independent variables in this paper) and the predicted theoretical relationship is strongly borne out by the data.

Therefore as instruments for trade policies we use the political ideology of the ruler/government, ideology multiplied by the country's capital-labor ratio and the capital-labor ratio. We use the ideological orientation ('Left', 'Center' or 'Right' coded as 3, 2 and 1 respectively to capture the extent of left orientation) of the chief executive (that of the chief executive's party or when considered appropriate that of the chief executive himself/herself) for political systems classified as presidential in the database, that of the largest government party for systems classified as parliamentary, and the average of these two orientations for systems classified as assembly-elected president. The data on political ideology are obtained from the Database of Political Institutions (DPI) (Beck et al, 2001) and measures whether the political party or ruler in power can be classified as left-wing, centrist or right-wing. The data on capital-labor ratios are obtained from Easterly and Levine (2001) who use aggregate investment and depreciation data to construct capital per worker series for 138 countries. For the instrumental variables results to be valid, we also require that ideology, the capital-labor ratio as well as their interaction to affect corruption only through its impact on trade policies, i.e., the errors in our estimating equations are orthogonal to these instruments. We test this assumption by reporting the Hansen test for overidentifying restrictions in the last row of table 7.

Table 7 presents the IV results for three measures of protection and two measures of corruption. We do not present results that use tariff and quota measures from the 1990s since data for our instruments, especially capital-labor ratio, are not available for the 1990s. Trade policies have a significant effect on bureaucratic corruption even when accounting for potential endogeneity and measurement errors in the protection variables. Our IV estimates of the effect of trade policies are higher than the OLS estimates (compare tables 2 and 4 with table 7). Now the magnitude of the effects of a one standard deviation increase in various trade policy

measures raises the ICRG corruption range from 0.9 (for tariffs) to 1.4 (for quotas). There is also a slight deterioration in the statistical significance of the IV estimates - this is likely as one may expect that these political economy factors explain only a fraction of the cross-sectional variation in trade protection. The Hansen test indicates that the instruments are uncorrelated with the error term, and that the excluded instruments are correctly excluded from the estimated equation. In addition, subsidies exacerbate corruption as do licensing regulations, weak political rights, and a weak media. As before the degree of schooling and wage-price regulations do not seem to exercise any significant influence.

It may be argued that the while the overidentification (OID) test validates our choice of instruments, if only one of the instruments is correlated with the instrumented variable, then effectively we do not have overidentification. This is less likely here since the theoretical model in Dutt and Mitra (2005) requires that all three variables be used simultaneously. Moreover, the first-stage regressions closely mirror the results of Dutt and Mitra (2005) where all three variables are individually and jointly significant. Despite this caveat, we experimented by removing capital-labor ratio from the list of instruments and including it as an additional explanatory variable. For the ICRG regressions, the coefficient on capital-labor ratio fails to be significant while the Sargan-Hansen tests again fail to reject the overidentifying restrictions. This gives us confidence in the reliability of the instruments.

4.3 Robustness Checks

In table 8, we consider two indirect measures of trade protection: the Hiscox-Kastner index and the number of years each country has stayed out of GATT/WTO. While the former captures both implicit and explicit levels of trade protection, the latter may be interpreted as a signal of lack of commitment to free trade. Columns 1 and 2 show that both these measures of trade restrictions significantly increase corruption. Further, as columns 3 and 4 show the effect

of both are robust to correction for endogeneity. The last four columns of table 8 examine whether the relationship between trade policies and corruption are robust to the inclusion of a variety of explanatory variables that previous work has shown to influence corruption. These include a dummy for British colonial heritage, an index of ethnolinguistic fractionalization and the percentage of Protestants in a country's population. Most do not seem to significantly and consistently influence corruption. For two regressions, we find that countries with a larger percentage of Protestants are also less corrupt.

We also considered a third measure of corruption - the German exporter corruption index (GCOR) which measures the total proportion of deals involving kickbacks, according to German exporters (See Neumann (1994). The GCOR measure has the advantage of being an easily interpretable cardinal measure, but data is available for only 43 countries. Despite the constraints in terms of data coverage we find that countries with higher levels of quotas and import duties also exhibit greater corruption according to this measure. Other explanatory variables which we tried were real per capita GDP, an index of inequality (Gini coefficient), share of natural capital in total capital (which comprises physical, human and natural capital) stock and the black market premium on exchange rates.[21]None of these variables are significant. While at first glance, the insignificance of per capita GDP may be surprising there is no model of corruption which predicts that richer countries will be less corrupt. In fact, per capita GDP is correlated with a variety of variables which do influence corruption - trade policies, democratic institutions, schooling, a vibrant media, bureaucratic wages amongst others. Once these variables are included, per capita GDP is no longer significant.

5 Panel Regression

Next, we test the relationship between corruption and trade protection using cross-sectional time series data available for import duty and corruption covering the period 1984-2004. As

mentioned in the introduction, there are various advantages to this approach. First, we can control for unobserved and time-invariant country-specific effects. Examples include the Protestant tradition and the colonial heritage of a country that Treisman (2000) finds as significantly influencing corruption. Second, we can control for the inertia in the incidence of corruption. This can arise from two sources: one real and one perceived. First, the choice to be corrupt or honest by bureaucrats may depend on the past incidence of corruption - if in the past many bureaucrats and government officials have engaged in malfeasance, the threat of sanctions and punishment for corrupt behavior is likely to be low. This provides greater incentives for bureaucrats today to engage in corrupt activities. Second, the corruption indices are based on perceptions and if there is a time lag in the updating of these perceptions, past levels of corruption may significantly influence today's perceived level of corruption. A panel approach can control for such history dependence in the incidence of corruption. Finally, a panel data specification allows us to address endogeneity and measurement error concerns for the explanatory variables by using their lagged values as instruments. The data on corruption is from the International Country Risk Guide and covers the period 1984-2004. Import duties are used as the measure of trade policy - data on this variable is available from 1980-1998. The additional explanatory variables we use are subsidies, the POLITY measure of democracy,[22]and schooling. For our other variables used in the cross–country regressions - licensing, wage-price regulation, bureaucratic wages and newspapers we lack observations over time for each country.

We use the generalized method of moments (GMM) difference estimator developed by Arellano and Bond, 1991. This technique is useful when the cross-sectional units (countries) are large while the number of periods (years) for which data is available is small. Once we include all variables (including lagged variables), our sample covers a maximum of 12 years. The panel is unbalanced as we have more observations on some countries than on others. The first question we address is the number of lags of the dependent variable to include on the right hand side.

We examined various specifications where we estimated how corruption in country i at time t depends on its lagged values. GMM estimates suggest that two lags of the dependent variable should be included. This is shown in the first column of table 9. Therefore, we estimate the following dynamic specification:

$$y_{it} = \alpha_1 y_{it-1} + \alpha_2 y_{it-2} + \mathbf{X}_{it}\boldsymbol{\beta} + (\eta_i + \upsilon_{it})\,;\ i = 1, 2, ...N;\ t = 3, 4, ...T \tag{1}$$

where y_{it} is corruption in country i at time t; y_{it-1} and y_{it-2} are corruption in country i in the previous two periods; $\mathbf{X}_{it}$ is the vector of explanatory variables; η_i is a time invariant country-specific effect possibly correlated with the explanatory variables and υ_{it} is an error term.[23]

Column (2) of table 9 presents the pooled OLS estimates of equation (1). We see that trade policies positively affect corruption in line with our cross-sectional results. However, the fact that η_i is stochastic implies that they are necessarily correlated with the lagged dependent variables y_{it-1} and y_{it-2}.This implies that the pooled OLS estimates are inconsistent and this bias does not vanish even as the number of countries in the sample increases. The Within Country estimator presented in column (3) eliminates this source of inconsistency by subtracting the mean values (within each country) from each of the variables. This transformation of equation (1) eliminates the country-specific effects η_i since the mean of η_i is itself η_i. Import duties, subsidies and the degree of democracy all affect the incidence of corruption as predicted. Here a one standard deviation increase in import duties raises the long-run levels of corruption by 0.2, a magnitude similar to the ones we obtained in the cross-sectional results.[24]It should be kept in mind that the Within estimator is consistent only in panels where T is large - the transformed lagged dependent variables are correlated with the transformed error term but this correlation goes to zero as T gets large. In the results presented in table 9, T is small ($T = 10$ for the majority of countries). Therefore, this correlation does not vanish and the Within estimator is

also likely to be inconsistent.

Since both OLS and Within estimators are inconsistent we employ a generalized method of moments (GMM) procedure developed by Arellano and Bond (1991) to generate consistent estimates of the parameters of interest and their asymptotic variance-covariance. Estimation proceeds by first differencing the data - this eliminates the country-specific effects η_i from the model

$$\Delta y_{it} = \alpha_1 \Delta y_{it-1} + \alpha_2 \Delta y_{it-2} + \Delta \mathbf{X}_{it}\boldsymbol{\beta} + \Delta v_{it};\ i = 1, 2, ...N;\ t = 4, ...T \tag{2}$$

Consistent estimators of the coefficients are obtained using two-stage least squares with instrumental variables that are correlated with the suspected endogenous variables but orthogonal to Δv_{it}. Instruments are required to deal with the likely endogeneity of some of the explanatory variables in $\mathbf{X}_{it}$ and the correlation between Δv_{it} and the lagged dependent variables Δy_{it-1} and Δy_{it-2}. We assume that the error term v_{it} is serially uncorrelated and that the initial conditions are predetermined. Both $\mathbf{X}_{it}$ and y_{it} may be correlated with the country effects η_i.This implies that we can use the following moment conditions:

$$E\left[y_{it-s}\Delta v_{it}\right] = 0 \text{ for } s \geq 2;\ t = 4, 5, ...T$$

In terms of the other explanatory variables, we adopt the weaker assumption that $\mathbf{X}_{it}$ is endogenous in the sense that $\mathbf{X}_{it}$ is correlated with v_{it} and earlier shocks but uncorrelated with $\mathbf{v}_{it+1}$ and subsequent shocks. We have already discussed the potential endogeneity concerns with trade policies. This may extend to our other variables as well. But more importantly, measurement errors are likely to be present in all these variables. Maintaining that $\mathbf{X}_{it}$ is potentially endogenous implies that we treat it symmetrically with the dependent variable and lagged values of $\mathbf{X}_{it}$, lagged two periods or more are available as instruments. Thus, the following additional

moment conditions apply

$$E\left[\mathbf{X}_{it-s}\Delta v_{it}\right] = 0 \text{ for } s \geq 2;\ t = 4, 5, ...T$$

The GMM estimator is consistent provided the error term v_{it} is not serially correlated and provided the lagged values of the explanatory variables are valid instruments. We perform two specification tests suggested by Arellano and Bond (1991). The first examines serial correlation in the error term. It tests whether the differenced error term (the residuals from the regression in differences) is first- and second-order serially correlated. First order serial correlation of the differenced error term is expected even if the original error term (in levels) is uncorrelated, unless the latter follows a random walk. Second-order serial correlation of the differenced residual indicates that the original error term is serially correlated, which means that the moment conditions are invalid. On the other hand, if the test fails to reject the null hypothesis of no second-order serial correlation, we conclude that the original error term is serially uncorrelated and the moment conditions are well specified. The second specification test is a Hansen test of over-identifying restrictions, which tests the null hypothesis of overall validity of the instruments by analyzing the sample analog of the moment conditions used in the estimation process. Failure to reject this null hypothesis gives support to the validity of instruments. $p-$values for these tests are reported in the last three rows of table 9. Finally, to control for heteroskedasticity we report results using the two-step GMM estimator. Simulation results have shown that the two-step estimates of the standard errors tend to be severely downward biased, especially in small samples (Arellano and Bond 1991; Blundell and Bond 1998). To compensate, we use a finite-sample correction to the two-step covariance matrix derived by Windmeijer (2005).

Column (4) in table 9 presents the GMM-difference estimates. As the last few rows show, these results are supported by the specification tests - our instruments are valid and there is

no evidence for serial correlation in v_{it}. Once again, the significant determinants of corruption are the lagged levels of corruption as well as import duties, subsidies and the degree of democracy.[25] A one standard deviation increase in import duties *within* a particular country raises the corruption index by 0.25. To get further insight into the magnitude of the effects consider the case of India. Highly protectionist with a weighted tariff rate of 48% in 1987, suppose India adopts free trade. Our estimates imply that corruption levels would halve and fall to the level of Belgium and Spain. Column (5) adds per capita GDP as a regressor[26] - a variable that has been widely used in prior empirical research on corruption. Our results clearly show that the coefficients on per capita GDP is not statistically significant and in fact, has the wrong sign. Thus, economic development on its own, does not appear to have an effect on the incidence of corruption. Its the underlying trade policy variables and democratic institutions that significantly influence corruption. Column (6) adds year dummies to column (5). None of the year dummies are significant and our results remain unaffected. Now, per capita GDP has the right sign but fails to be significant. Finally, column (7) replaces the import duty measure with the indirect Hiscox-Kastner measure of trade restrictions, lagged one period (the current value is not significant). This variable too positively influences the incidence of corruption, testifying to the robust influence of trade restrictions on corruption.

6 Conclusion

In this paper we argue, that from an operational standpoint, the relevant question is the one having to do with the consequences of trade policies for bureaucratic corruption rather than of trade volumes. We analyze whether the incidence of corruption is increasing in trade policies offered to the domestic industry, both in terms of protection from foreign competition as well as through the subsidization of production. We also examine whether corruption is decreasing in the remuneration of bureaucrats and in the checks and balances on the bureaucracy offered

by a democratic polity, an educated public and a vibrant media. Using a sample of 38-82 countries, we find that while the magnitude of the relationship between protectionist policies and corruption is not very big, nevertheless, we observe a consistent relationship between the two. This relationship holds after controlling for a variety of factors that potentially influence corruption. It is robust to accounting for endogeneity concerns and measurement error. We also find evidence of a link between corruption and trade policies within countries using dynamic estimation models. The relationship is supported across a range of measures of trade protection and alternative measures of corruption.

These findings offer several policy implications. First, when thinking optimal tariffs, subsidies, and infant industry protection arguments, policymakers must recognize that there may be a flip side to the arguments for transferring rents from foreigners to domestic producers - namely, that it encourages corruption on part of the bureaucracy. Any assessment of optimal levels of protection that ignores these effects would fail to maximize welfare since corruption itself can be welfare reducing. Similarly, a movement towards greater openness will yield additional benefits by mitigating corruption. Second, our findings suggest that scaling back protectionist policies can facilitate improvement in one aspect of institutions. Trade liberalization, has the potential of mitigating corruption and improving the governance structure. Third, corruption arises from the discretionary power granted to the bureaucracy. It is reinforced by and feeds upon the rents generated through further interventions by the state in the domestic economy. This provides some validation to Gary Becker's prescription of "abolish the state and you shall abolish corruption."[27]While interventionist policies are desirable in many situations, this paper establishes that the any additional detrimental effects should be taken into account when designing such policies. Finally, given our findings, one way to tackle corruption is by improving methods of detection of corrupt acts. Improvement in political rights, a vibrant press, and education of the public create greater accountability and deter corrupt activities.

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Notes

[1] Ades and Di Tella (1999) also use fuel and mineral exports as a measure of rents but this variable fails to be significant and sometimes enters with the wrong sign. Even this variable may suffer from endogeneity problems as pointed out by Easterly (2002). Corrupt and myopic governments such as in Nigeria "eat-the-future" by choosing to extract and export these natural resources at a rapid rate.

[2] Frankel and Romer (1999) recognize this distinction between trade volumes and trade policies. They caution that their results on the relationship between trade volumes and income levels cannot be directly applied to the effects of trade policies.

[3] See Bardhan (1997) for a review.

[4] See also Bhagwati (1982) for a general concept of rent-seeking (directly unproductive) activities and the welfare consequences of such activities.

[5] The monopolistic competition differentiated goods assumption is not critical - a perfectly competitive setup where entrepreneurs have heterogeneous cost structures (say due to different levels of organizational capital/knowledge) will also yield a similar result. See Bliss and Di Tella (1997) on the links between corruption and competition.

[6] Bhagwati and Hansen (1973), Bhagwati and Srinivasan (1973), Kemp (1976), Ray (1978) analyze smuggling as a directly unproductive activity and the relationship between commercial policy and smuggling.

[7] Bardhan (1997) notes that the distinction between bureaucratic corruption and political corruption is often blurred. The US, in some sense, may be corrupt in terms of the immense amounts of political and campaign contributions in electoral politics and the ubiquitous role of lobbies in determining policies. However, these are legally sanctioned activities and standard measures of corruption do not find the US as a highly corrupt country. The key distinction is legal vs. illegal, with corruption measures capturing the prevalence of illegal demand for bribes.

[8] Both the TI and ICRG measure are perception based measures of corruption. The recent literature on corruption has started using measures of corruption that are not perception based on a country-by-country basis. See Olken (2005) and Fisman and Wei (2005). However, this lies beyond the scope of this paper.

[9] Note the import duty measure is a weighted average of import duties on each good where the weights are the share of imports of that good in total imports.

[10] The variable is referred to as tariffs, although it includes all import charges, such as duties and customs fees.

[11] Since many countries became independent after 1948 this variable is calculated as $|GATT\ accession\ year - \max(1948, independ$

[12]The manufacturing wages are also in 1997 dollars. The two datasets yield wage-ratio for 59 countries. The ratio ranges from a low of 0.095 for South Africa to 2.93 for Singapore.

[13]We also used data from van Rijckeghem and Weder who have compiled data on civil sector wages for 28 developing countries. However, this results in a very small sample of countries.

[14]Standard errors are adjusted for clustering at the country level. Note also that the R^2 reported in the tables for the ordered probit estimates are the pseudo R^2.

[15]For a detailed discussion of the problems with the Barro-Lee quota coverage ratios, see Leamer (1990).

[16]For the ordered probit estimates in table 5, we drop the oil dummy when we use non-tariff barriers in the 1990s as the regressor. This is required for the log-likelihood to converge.

[17]We also aggregated these three measures into a single linear composite, using principle component analysis, to construct a single variable. This corrects for the high collinearity between schooling, newspapers and political rights. This variable is extremely significant in all of the regressions. These results are available from the author upon request. See table 6 as well.

[18]It might be plausible that schooling, political rights and the number of newspapers simply act as an index of development. To address this, we added per capita GDP as an independent regressor - it does not enter significantly in a majority of the regression results.

[19]We also experimented with a dummy for Latin American countries. This failed to be significant. Surprisngly, we obtain a negative coefficient on sub-Saharan African countries. Perhaps, once we control for trade restrictions, licensing requirements, regulations, lack of schooling and lack of political rights, sub Saharan African countries are not as corrupt as we would expect them to be.

[20]The principal component is constructed as $-0.37 * political\ rights + 0.40 * schooling + 0.43 * newspapers$.Also, as before the quota measure does not yield any meaningful results and are not included in the table.

[21]It may be argued that governments who are protectionist are also governments that fix exchange rates at non-market levels and ration foreign exchange through bureaucrats. However, the black-market premium on the exchange rate fails to be significant. In fact, the black market premium is more likely to be a symptom of distorted macroeconomic policies rather than a driver of corruption. See Rodrik and Rodriguez, 2000 for a discussion.

[22]The Polity IV measure from Marshall, Jaggers and Gurr, 2000 has more comprehensive coverage, available for 123 countries from 1984-1998. It calculates a democracy score and subtracts from it an autocracy score. These scores are based on coding the competitiveness of political participation, the openness and competitiveness of executive recruitment, and constraints on the chief executive. Higher numbers indicate a more democratic polity.

[23]Measurement error in corruption is a serious concern with the presence of the lagged dependent variables on the right hand side. However, if this error is driven by country-specific specific characteristics and vary little over time, they will be subsumed within the country specific effect η_i.

[24]The standard deviation of import duties for observations included in column 3 is 9.098. The coefficient on import duties is 0.0077 (rounded off and shown as 0.008 in the table). So a one standard deviation increase in import duties leads to an increase in corruption of 0.0077*9.098 = 0.07. Given that the regressions include the lagged dependent variable, this represents the short-run. To the obtain long-run effect, each coefficient must be divided by 1 minus the sum of the coefficients on the two lagged dependent variables. This equals $0.07/(1 - 1.01 + 0.328) = 0.22$.

[25]Lagged values of import duties, subsidies, democracy and schooling were not significant.

[26]The data on real per capita GDP is from Penn World Tables.

[27]This is a positive, rather than a normative statement.

Figure 1: Tariffs and Corruption (Levels)

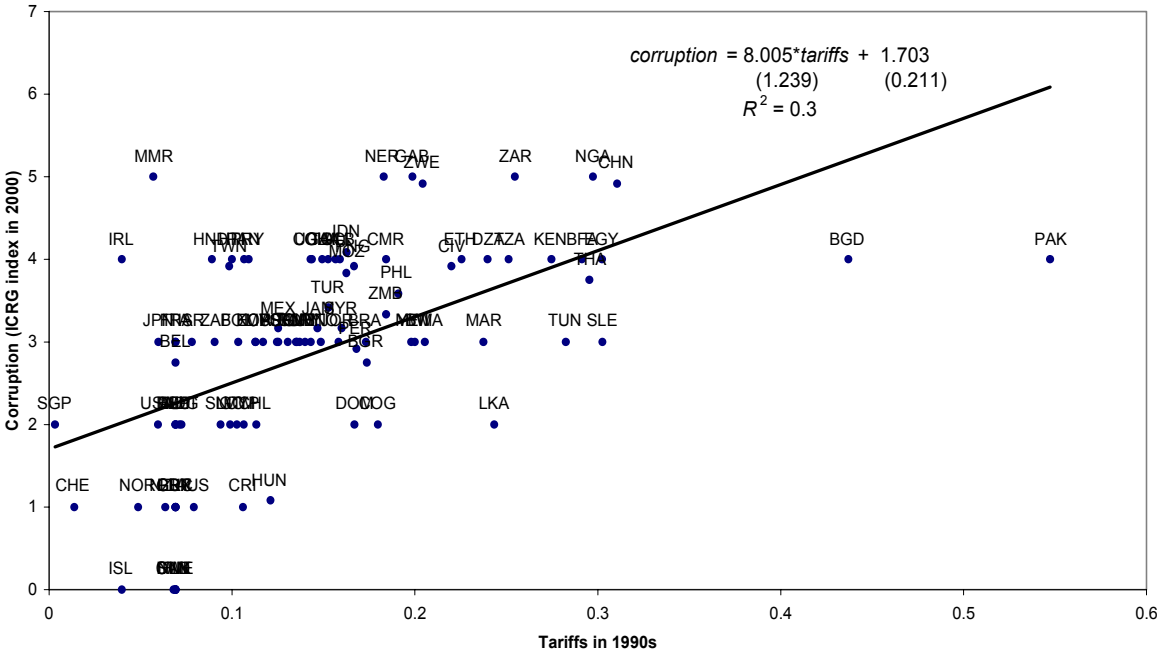

Figure 2: Tariffs and Corruption (First Differences)

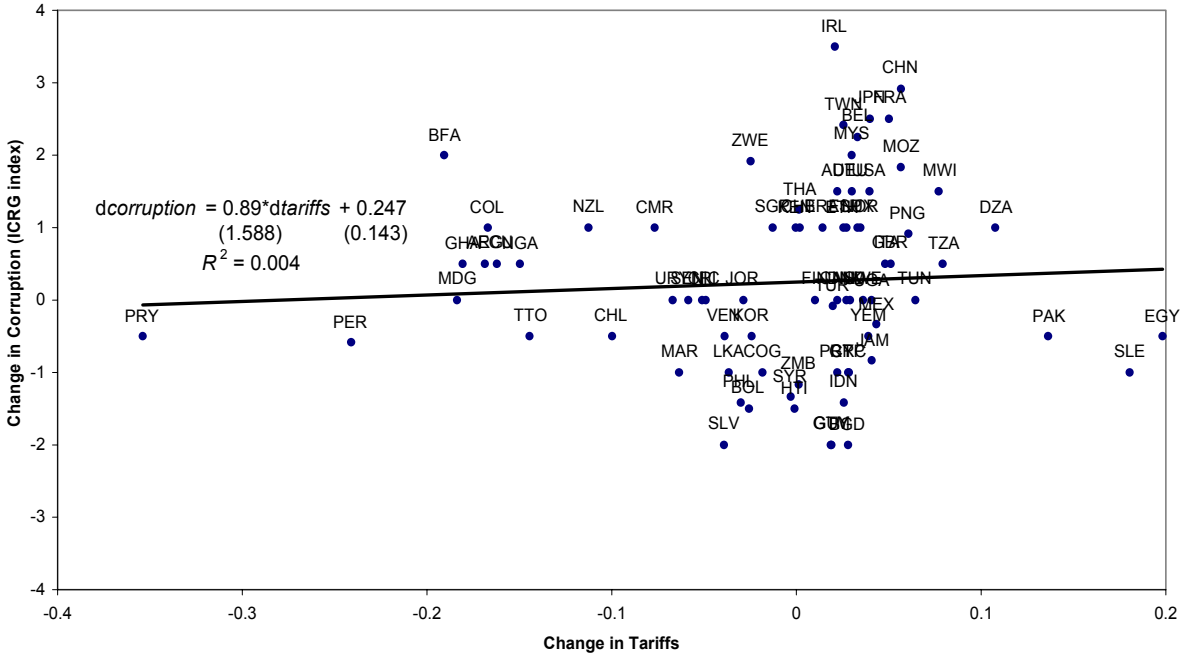

Table 1: Summary Statistics

Cross Section Variables	Obs	Mean	Std. Dev.	Min	Max	Source
ICRG (average of 1984 to 1990)	129	2.67	1.53	0	6	Political Risk Services
ICRG (year 2000)	140	3.03	1.23	0	5	Political Risk Services
TI (year 2000)	93	5.28	2.38	0	8.8	Transparency International
German Corruption Index (GCOR)	42	3.52	3.44	0	10	Neumann (1995)
tariff (1980s)	93	0.16	0.12	0	0.48	Barro and Lee (1993)
quota coverage ratio (1980s)	92	0.20	0.24	0	0.87	Barro and Lee (1993)
tariff (1990s)	121	0.15	0.09	0	0.55	Unweighted average tariff, 1990-99. UNCTAD (2001)
quota coverage ratio (1999)	45	0.22	0.14	0	0.67	Core NTBs plus technical measures & automatic licensing.UNCTAD
import duty (1980-90, avg.)	91	12.01	8.29	0.01	35.68	World Development Indicators (2000)
Hiscox-Kastner measure	78	27.21	9.25	2.82	48.49	Hiscox and Kastner, 2002
subsidy (% of GDP)	126	0.17	0.52	0	5.26	World Development Indicators (2000)
licensing	162	3.36	0.92	1	5	Heritage Foundation, 2000
wage-price controls	162	2.83	0.89	1	5	Heritage Foundation, 2000
dictatorship (Gastil political rights)	166	4.28	2.17	1	7	Freedom House
schooling (primary enrolment)	138	59.72	25.43	4.33	99.74	World Development Indicators (2000)
newspapers per 1000 people	161	122.47	153.04	0.07	823.44	World Development Indicators (2000)
government wages relative to manuf. sectc	59	1.36	0.82	0.09	4.64	Mukhejee and de Tommaso, World Bank
ideology (1=Right, 2=Center, 3=Left)	92	2.11	0.83	1	3	Database of Political Institutions, 2001
log of capital-labor ratio	92	9.36	1.54	5.71	11.43	Easterly and Levine (2001)
*ideology*capital-labor ratio*	92	19.21	7.30	7.34	33.75	
Panel Variables						
ICRG	2740	2.83	1.38	0	6	Political Risk Services
import duty	1774	10.55	9.52	0	73.71	World Development Indicators (2000)
Hiscox-Kastner measure	1014	30.57	9.03	2.82	53.65	Hiscox and Kastner, 2002
subsidy	2256	30.28	21.05	0.00	89.85	World Development Indicators (2000)
Polity democracy measure	3125	0.69	7.51	-10	10	Polity IV
schooling (primary enrolment)	2547	81.84	22.06	9.8	100	World Development Indicators (2000)

Table 2: ICRG Corruption Index

Ordinary Least Squares

	tariff80s	***tariff90s***	***quota80s***	***quota99***	***import duty***
trade policy	1.2***	2.722***	-0.5	1.998***	0.033**
	(0.539)	(1.273)	(0.561)	(0.813)	(0.017)
subsidy	0.269***	0.47***	0.255***	0.596***	0.242***
	(0.052)	(0.053)	(0.058)	(0.103)	(0.063)
licensing	0.44***	0.069	0.494***	0.098	0.241
	(0.194)	(0.122)	(0.198)	(0.221)	(0.25)
wage-price regulation	-0.248	0.093	-0.062	-0.059	-0.114
	(0.212)	(0.136)	(0.221)	(0.347)	(0.187)
political rights	0.261***	0.118***	0.266***	0.055	0.156***
	(0.076)	(0.05)	(0.08)	(0.115)	(0.063)
newspapers	-0.005***	-0.004***	-0.006***	-0.005***	-0.006***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
schooling	-0.001	0.008	-0.002	-0.00002	-0.001
	(0.008)	(0.006)	(0.009)	(0.013)	(0.008)
sub-saharan africa	-0.899***	0.861***	-0.792*	0.488	-0.691*
	(0.422)	(0.287)	(0.481)	(0.52)	(0.43)
east asia	0.569	0.77***	0.503	0.894***	0.661
	(0.46)	(0.182)	(0.526)	(0.409)	(0.534)
oil	1.094***	0.744***	0.977***	0.866***	0.844***
	(0.39)	(0.252)	(0.407)	(0.413)	(0.313)
constant	1.276	1.077	1.14	2.041	1.904**
	(0.939)	(0.744)	(1.055)	(1.943)	(1.047)
No. of observations	63	77	62	40	82
Joint Significance Test	29.08***	16.17***	23.12***	14.88***	27.33***
R^2	0.75	0.63	0.7	0.57	0.6

Robust standard errors in parantheses; *** - significant at 5% level, ** - significant at 10% level * - significant at 15% level

Table 3: ICRG Corruption Index
Ordered Probit

	tariff80s	***tariff90s***	***quota80s***	***quota99***	***import duty***
trade policy	1.37***	4.477***	-0.786	3.197***	0.026**
	(0.561)	(2.108)	(0.554)	(1.258)	(0.015)
subsidy	0.597***	0.589***	0.536***	0.811***	0.483***
	(0.103)	(0.086)	(0.106)	(0.182)	(0.101)
licensing	0.592***	0.114	0.577***	0.2	0.3
	(0.279)	(0.157)	(0.236)	(0.291)	(0.258)
wage-price regulation	-0.362	0.104	-0.057	-0.04	-0.133
	(0.279)	(0.192)	(0.244)	(0.406)	(0.186)
political rights	0.297***	0.133**	0.279***	0.029	0.157***
	(0.1)	(0.069)	(0.089)	(0.12)	(0.069)
newspapers	-0.009***	-0.005***	-0.008***	-0.007***	-0.008***
	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)
schooling	0.007	0.012*	0.004	0.004	0.004
	(0.01)	(0.008)	(0.009)	(0.016)	(0.008)
sub-saharan africa	-1.14***	1.509***	-0.903**	0.716	-0.754**
	(0.512)	(0.463)	(0.511)	(0.741)	(0.435)
east asia	1.197***	1.305***	0.939**	2.417***	0.938**
	(0.562)	(0.319)	(0.569)	(0.805)	(0.553)
oil	1.603***	1.07***	1.234***	1.39***	0.877***
	(0.64)	(0.362)	(0.548)	(0.51)	(0.386)
No. of observations	63	77	62	40	82
Joint Significance Test	75.23***	75.19***	80.22***	53.52***	99.98***
R^2	0.36	0.31	0.31	0.29	0.25

Robust standard errors in parantheses; *** - significant at 5% level, ** - significant at 10% level * - significant at 15% level

Table 4: TI Corruption Index

Ordinary Least Squares

	tariff80s	***tariff90s***	***quota80s***	***quota99***	***import duty***
trade policy	1.743**	3.916***	-0.133	4.355***	0.026
	(1.047)	(1.738)	(0.573)	(1.14)	(0.019)
subsidy	0.802***	0.728***	0.791***	0.894***	0.783***
	(0.101)	(0.088)	(0.124)	(0.131)	(0.09)
licensing	1.11***	1.121***	1.153***	1.143***	1.059***
	(0.278)	(0.251)	(0.285)	(0.292)	(0.247)
wage-price regulation	-0.056	-0.039	0.033	0.15	0.038
	(0.26)	(0.264)	(0.278)	(0.355)	(0.264)
political rights	0.175	0.266***	0.148	0.268*	0.217***
	(0.127)	(0.095)	(0.135)	(0.167)	(0.096)
newspapers	-0.007***	-0.007***	-0.008***	-0.007***	-0.007***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)
schooling	-0.012	-0.006	-0.015	-0.024	-0.011
	(0.011)	(0.009)	(0.012)	(0.018)	(0.01)
sub-saharan africa	-0.08	-0.167	-0.148	1.127	-0.125
	(0.418)	(0.392)	(0.492)	(0.769)	(0.428)
east asia	1.265***	1.037***	1.254***	0.996	1.192***
	(0.507)	(0.473)	(0.565)	(1.04)	(0.485)
oil	0.932	0.766	0.824	1.281	0.833
	(0.677)	(0.829)	(0.715)	(1.246)	(0.806)
constant	2.254*	1.288	2.623*	1.275	2.049*
	(1.431)	(1.247)	(1.649)	(1.977)	(1.278)
No. of observations	54	62	52	38	60
Joint Significance Test	35.77***	40.89***	29.41***	33.12***	38.73***
R^2	0.84	0.82	0.81	0.85	0.82

Robust standard errors in parantheses; *** - significant at 5% level, ** - significant at 10% level * - significant at 15% level

Table 5: TI Corruption Index
Ordered Probit

	tariff80s	***tariff90s***	***quota80s***	***quota99***	***import duty***
trade policy	2.494***	5.322***	-0.594	6.197***	0.033***
	(1.033)	(1.915)	(0.611)	(2.007)	(0.016)
subsidy	0.733***	0.671***	0.694***	1.011***	0.719***
	(0.167)	(0.149)	(0.199)	(0.195)	(0.148)
licensing	1.079***	1.213***	1.113***	1.363***	1.155***
	(0.288)	(0.287)	(0.285)	(0.328)	(0.281)
wage-price regulation	-0.165	-0.134	-0.055	0.532	-0.024
	(0.281)	(0.279)	(0.274)	(0.446)	(0.262)
political rights	0.138	0.221***	0.111	0.294***	0.187**
	(0.119)	(0.094)	(0.12)	(0.148)	(0.098)
newspapers	-0.007***	-0.006***	-0.007***	-0.006***	-0.007***
	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)
schooling	-0.006	-0.001	-0.011	-0.025*	-0.006
	(0.009)	(0.007)	(0.009)	(0.017)	(0.008)
sub-saharan africa	1.14	0.642	0.879	1.546***	0.624
	(0.813)	(0.655)	(0.769)	(0.714)	(0.649)
east asia	1.493***	1.266***	1.322***	2.714***	1.37***
	(0.422)	(0.377)	(0.459)	(0.723)	(0.401)
oil	1.383*	1.093	1.035		1.096
	(0.853)	(0.879)	(0.791)		(0.879)
No. of observations	54	62	52	38	60
Joint Significance Test	96.92***	96.95***	129.14***	120.56***	95.75***
R^2	0.4	0.4	0.37	0.43	0.39

Robust standard errors in parantheses; *** - significant at 5% level, ** - significant at 10% level * - significant at 15% level

Table 6: Relative Civil Sector Wages and Corruption

	International Country Risk Guide				Transparency International			
	tariff80s	***tariff90s***	***quota99***	***import duty***	***tariff80s***	***tariff90s***	***quota99***	***import duty***
trade protection	0.96**	2.716**	2.089**	0.062***	1.245	4.122**	5.685***	0.036*
	(0.485)	(1.478)	(1.156)	(0.029)	(1.026)	(2.462)	(1.255)	(0.022)
subsidy	0.42	0.357	0.613***	0.341	0.809***	0.688***	0.826***	0.834***
	(0.341)	(0.268)	(0.158)	(0.248)	(0.289)	(0.285)	(0.232)	(0.274)
licensing	0.589***	0.538***	0.534*	0.111	1.238***	1.119***	1.352***	1.059***
	(0.198)	(0.155)	(0.32)	(0.367)	(0.401)	(0.335)	(0.498)	(0.32)
wage-price regulation	-0.35**	-0.181	0.748**	-0.146	0.069	-0.019	0.462	0.132
	(0.196)	(0.254)	(0.382)	(0.203)	(0.399)	(0.36)	(0.461)	(0.348)
principal component	-1.261***	-1.185***	-0.694***	-1.062***	-1.604***	-1.626***	-1.789***	-1.634***
	(0.121)	(0.115)	(0.196)	(0.141)	(0.317)	(0.308)	(0.307)	(0.278)
wages	-0.427**	-0.535***	0.784*	-0.644***	-0.264	-0.497*	0.008	-0.386
	(0.211)	(0.238)	(0.514)	(0.202)	(0.304)	(0.318)	(0.877)	(0.319)
sub-saharan africa	-0.915***	-1.238***	2.031***	-1.462***	-0.191	-0.314	1.82	-0.362
	(0.369)	(0.359)	(0.905)	(0.423)	(0.666)	(0.51)	(1.228)	(0.629)
east asia	1.019***	1.17***	1.239***	1.121***	1.459***	1.471***	2.131***	1.506***
	(0.467)	(0.495)	(0.471)	(0.495)	(0.546)	(0.517)	(0.9)	(0.498)
oil	0.811*	0.409	-1.642**	0.762*	-0.406	-0.689**	-1.234	-0.729**
	(0.512)	(0.421)	(0.799)	(0.455)	(0.449)	(0.352)	(1.123)	(0.402)
constant	1.911***	1.567***	-2.175	2.766***	0.649	1.327	-2.116	1.151
	(0.705)	(0.621)	(1.789)	(1.135)	(1.49)	(1.161)	(2.372)	(1.175)
No. of observations	37	45	26	49	35	42	26	41
F-statistic	39.82***	59.6***	12.67***	21.36***	18.54***	23.72***	25.69***	20.98***
R^2	0.89	0.82	0.71	0.66	0.83	0.82	0.87	0.83

Robust standard errors in parantheses; *** - significant at 5% level, ** - significant at 10% level * - significant at 15% level

Table 7: Two Stage Least Squares

	International Country Risk Guide			Trasparency International		
	tariff80s	***quota80s***	***import duty***	***tariff80s***	***quota80s***	***import duty***
trade policy	6.754**	5.539	0.21***	1.335*	2.192*	0.042**
	(4.049)	(5.771)	(0.1)	(0.928)	(1.336)	(0.024)
subsidy	0.28***	0.123	0.301**	0.768***	0.719***	0.763***
	(0.1)	(0.155)	(0.173)	(0.088)	(0.096)	(0.066)
licensing	0.498***	0.143	0.249	1.106***	1.02***	1.002***
	(0.217)	(0.508)	(0.31)	(0.25)	(0.301)	(0.23)
wage-price regulation	-0.098	-0.547	-0.107	0.099	0.03	0.095
	(0.297)	(0.45)	(0.247)	(0.254)	(0.28)	(0.212)
political rights	0.268***	0.388***	0.212***	0.344***	0.387***	0.358***
	(0.098)	(0.16)	(0.092)	(0.129)	(0.14)	(0.082)
newspapers	-0.003***	-0.003	-0.003**	-0.008***	-0.007***	-0.008***
	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
schooling	0.008	0.015	0.011	-0.003	0.007	0.0002
	(0.01)	(0.023)	(0.013)	(0.01)	(0.012)	(0.008)
sub-saharan africa	-1.002	0.104	-1.639**	-0.632**	-0.275	-0.578***
	(0.779)	(1.306)	(0.893)	(0.36)	(0.459)	(0.289)
east asia	0.379	1.822**	0.491	1.845***	2.378***	1.882***
	(0.781)	(1.025)	(0.655)	(0.352)	(0.392)	(0.276)
oil	1.152*	3.162***	1.855***	3.274***	4.306***	3.487***
	(0.765)	(1.48)	(0.588)	(0.57)	(0.732)	(0.39)
constant	-0.929	-0.017	-0.966	0.926	0.213	0.883
	(1.459)	(2.664)	(1.918)	(1.318)	(1.456)	(0.968)
No. of observations	50	48	62	44	42	50
Joint Significance Test	21.47***	12.03***	7.61***	43.47***	47.4***	62.63***
R^2	0.88	0.68	0.78	0.86	0.83	0.86
OID test p-value	0.25	0.58	0.3	0.46	0.74	0.37

Robust standard errors in parantheses; *** - significant at 5% level, ** - significant at 10% level * - significant at 15% level

Table 8: Robustness Checks

	ICRG Hiscox-Kastner	***ICRG GATT/WTO***	***ICRG (IV) Hiscox-Kastner***	***ICRG (IV) GATT/WTO***	***ICRG tariff80s***	***ICRG tariff90s***	***ICRG quota90s***	***ICRG import duty***
trade policy	0.027***	0.017*	0.059***	0.1***	1.811***	3.331***	2.751***	0.017
	(0.013)	(0.011)	(0.028)	(0.045)	(0.723)	(1.28)	(1.117)	(0.016)
subsidy	0.292***	0.251***	0.349***	0.305***	0.303***	0.243***	0.463***	0.277***
	(0.054)	(0.056)	(0.087)	(0.141)	(0.084)	(0.077)	(0.142)	(0.089)
licensing	0.621***	0.329*	0.591***	0.121	0.444***	0.076	0.351*	0.511***
	(0.165)	(0.21)	(0.136)	(0.317)	(0.209)	(0.114)	(0.222)	(0.189)
wage-price regulation	-0.34**	-0.065	-0.226	0.41	-0.217	0.017	0.083	-0.017
	(0.181)	(0.182)	(0.175)	(0.412)	(0.239)	(0.154)	(0.335)	(0.219)
political rights	0.285***	0.072	0.308***	-0.076	0.269***	0.121**	0.062	0.264***
	(0.065)	(0.083)	(0.064)	(0.188)	(0.078)	(0.063)	(0.1)	(0.08)
newspapers	-0.004***	-0.006***	-0.004***	-0.005***	-0.006***	-0.002*	-0.001	-0.005***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)
schooling	-0.004	0.001	0.003	0.021	-0.001	0.012**	-0.006	-0.004
	(0.009)	(0.008)	(0.007)	(0.018)	(0.008)	(0.007)	(0.014)	(0.008)
British colony					-0.259	0.044	1.518**	0.058
					(0.406)	(0.275)	(0.753)	(0.386)
fractionalization					-0.456	-0.214	0.55	0.042
					(0.532)	(0.531)	(1.007)	(0.497)
percentage protestant					0.005	-0.017***	-0.016***	0.001
					(0.006)	(0.005)	(0.006)	(0.006)
sub-saharan africa	-0.778*	-0.247	-1.468***	0.223	-0.565	1.397***	1.985***	-0.976***
	(0.524)	(0.512)	(0.505)	(0.88)	(0.51)	(0.384)	(0.888)	(0.441)
east asia	0.611	0.827*	0.524	0.379	0.767*	0.685***	0.316	0.533
	(0.426)	(0.527)	(0.471)	(1.263)	(0.472)	(0.231)	(0.452)	(0.54)
oil	1.004***	0.885***	2.362***	0.957	1.291***	0.716***	0.233	1.029***
	(0.394)	(0.294)	(0.41)	(1.326)	(0.457)	(0.267)	(0.409)	(0.493)
constant	0.32	1.685**	-1.28	-1.085	1.239	0.988	9.601***	0.724
	(1.192)	(0.901)	(1.156)	(2.302)	(0.973)	(0.931)	(3.708)	(1.086)
No. of observations	62	84	49	62	60	71	39	70
Joint Significance Test	43.94***	23.6***	36.37**	5.23***	25.15***	18.53***	14.57***	21.97***
R^2	0.8	0.62	0.82	0.65	0.78	0.69	0.72	0.73

Robust standard errors in parantheses; *** - significant at 5% level, ** - significant at 10% level * - significant at 15% level

Table 9: Panel Data Reults with Import Duties and ICRG Index of Corruption

	GMM difference	*OLS levels*	*Within Country*	*GMM difference*	*GMM difference*	*GMM difference with time effects*	*GMM difference (Hiscox-Kastner)*
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
corruption(t-1)	1.13***	1.162***	1.01***	0.981***	0.997***	0.964***	0.953***
	(0.053)	(0.034)	(0.035)	(0.052)	(0.053)	(0.061)	(0.142)
corruption (t-2)	-0.258***	-0.238***	-0.328***	-0.324***	-0.32***	-0.303***	-0.42**
	(0.054)	(0.034)	(0.036)	(0.047)	(0.046)	(0.112)	(0.235)
trade policy		0.003***	0.008***	0.009***	0.009***	0.014***	0.016**
		(0.001)	(0.003)	(0.002)	(0.002)	(0.006)	(0.009)
subsidy		-0.0001	0.004***	0.005**	0.002	0.0001	0.005
		(0.001)	(0.002)	(0.003)	(0.003)	(0.002)	(0.008)
polity score		-0.005***	-0.014***	-0.017***	-0.014**	-0.014	-0.007
		(0.002)	(0.005)	(0.008)	(0.008)	(0.013)	(0.014)
schooling		-0.001	0.004	0.002	0.008	0.018	-0.007
		(0.001)	(0.003)	(0.006)	(0.005)	(0.014)	(0.008)
per capita GDP					0.022	-0.17	
					(0.164)	(0.371)	
constant	0.393***	0.224***	0.213				
	(0.045)	(0.09)	(0.323)				
No. of observations	2458	817	817	722	680	680	368
No. of countries	141	81	81	77	73	73	59
F-statistic	1619.14***	2200.85***	154.61***	97.28***	99.27***	44.04***	30.28***
Specification tests (p-values)							
(a) OID test	0.99			1	1	1	1
(b) Serial correlation							
First order	0	0	0	0	0	0	0.006
Second order	0.219	0.237	0.979	0.999	0.85	0.68	0.795

Robust standard errors in parantheses; *** - significant at 5% level, ** - significant at 10% level * - significant at 15% level