Trading Profiles and Developing Country Participation in the WTO Dispute Settlement System

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Abstract

It has been alleged since its inception that the WTO Dispute Settlement (DS) mechanism is biased against developing countries, as manifested in e.g. allegedly too low rates of dispute initiation. To shed light on this issue, this study analyses the determinants of developing country participation in the DS system, using bilateral industry-level trade data, and a data set on dispute initiation that is significantly richer than what has been employed in the literature. But the study also points to a number of fundamental conceptual and data problems that beset the whole empirical literature that seeks to draw policy conclusions based on country participation in the DS system. While perhaps appreciated by researchers working in this area, these problems appear to go unnoticed by practitioners drawing on this literature.

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Non-technical Summary

There has been an undercurrent of worry around the WTO DS mechanism since its inception. In particular, it has been alleged that the system is biased against developing countries. On the basis of this worry, there have been proposals for reform of the system to remedy perceived biases, particularly in dispute initiation. The starting point of research in this area is therefore a seemingly simple question. "Do developing countries use the DS mechanism less than they 'should' based on objective criteria?"

In our empirical analysis, we have tried to highlight aspects of this question, by improving on the earlier literature in several respects. First, we use a much richer dispute data set than has been used so far in the literature, by including all dispute initiation during the period 1995-2006. Second, we focus more on the role of industrial structure than has been done in the literature. Third, we employ econometric techniques that, while not entirely new in the field, are more suitable to the situation at hand than what is often used. Our results suggest that the composition of trade, the volume of trade, income levels, aid levels, and legal capacity, explain the observed aggregate level of dispute initiation fairly well. Predictions from the empirical model also suggest that Low Income Developing countries (this group excludes least developed countries), have launched more complaints than they should have, based on these characteristics.

Fourth, we use the estimated model to answer two fundamental questions concerning the determinants of Least Developed Country (LDC) participation as complainants, questions that to the best of our knowledge have not been highlighted in the literature. Our first question concerns the role of economic country size. It is often said that since LDCs typically are very small in terms of GDP, in terms of trade, etc, that they do not have incentives to launch disputes. We therefore make the thought-experiment of merging all LDCs into an "LDC Union" for the handling of complaints in the DS system. This Union is instructed to base its decisions concerning litigation on the combined exports of its members, and would draw on the combined resources of the countries in other respects. The model predicts that a country with the characteristics of this "LDC Union" would have

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initiated roughly twice as many disputes as the model predicts that this group of countries would have launched if acting individually. One should be careful not to over-emphasize the validity of this magnitude. More interesting is that this experiment suggests that LDCs may have so few disputes not only because of small trade volumes, or because of small GDP levels, but also because of the *interaction* between such explanatory factors.

The second question we examine is the common perception in the policy literature that the LDC trade *composition* explains their seemingly low participation rates. To this end we make the further thought experiment of letting the export structure of this "LDC Union" be the same as the average of the exports of G2, Earlier Industrialized and Newly Industrialized countries, while keeping the total volume of exports unchanged. This "LDC Union" is hence in terms of industry export structure a replica of the richer countries, but is in other respects an aggregation of LDCs. Using the estimated model, this change in export composition would have a fairly limited impact on dispute initiation by LDC, contrary to what is often suggested. In other words, the composition of trade does not appear to be a determining factor.

We would finally like to emphasize the great caution that is needed when drawing policy conclusions based on observations concerning dispute initiation in the DS system. Such conclusions are inevitably based on a number of special assumptions that are typically not made explicit. For instance, there are conceptual problems with regard to the definition of the unit of account ("a dispute") as well as relevant benchmarks, there are econometric problems with regard to how to distinguish the determinants of dispute initiation as well as how to handle the dominance of zeros in the data, there are data availability problems with regard to a number of important variables such as legal capacity and power. In addition, there are conceptual problems with regard to how to frame relevant and well-defined questions that can be answered within the model. We have here tried to address some of these problems, but many still remain.

1.   Introduction

The role of developing countries in the dispute settlement mechanisms of the multilateral trading system has steadily increased during the last 15 years. There are probably several reasons for this increasing interest. One is the dramatic increase in developing country membership, which today accounts for the vast majority of members of the World Trade Organization (WTO). Another reason is the hopes attached to the creation of the dispute settlement (DS) mechanism of the WTO, which was intended to be less dependent on political or diplomatic solutions, and more on formal legal procedures. Yet another reason for the increased interest in the working of the DS mechanism is the increased reliance during this period on trade liberalization as a means of enhancing development. A core issue in this debate has been the limited use of the WTO DS mechanism by developing countries. Over the last decade, a burgeoning academic literature (mainly in economics and political science) has focused on the extent to which developing countries can be said to be underrepresented, and if so, what the reasons are for their relatively limited participation.

Three themes can be said to dominate this literature. One is the notion that the use of the DS system largely reflects commercial interests. The limited participation of developing countries, and in particular least developed countries, would according to this view reflect their smaller trade flows. For example, Horn et al (1999) show that the distribution of the actual disputes for the years 1995-98 across the Members of the WTO closely corresponds to the structure of global trade, leaving very little to be explained by other factors. A second theme is that low participation by developing countries reflects their limited legal and administrative capacity to identify illegalities, and to pursue complaints, and/or their inability to purchase such services from e.g. law firms. A third theme, often denoted the "power hypothesis", is that developing countries abstain from launching complaints either from a fear that they will face retaliation by richer adversaries, or from a belief that they will not be able to enforce rulings by WTO courts in their favor. These three explanations of developing country participation are of course not mutually exclusive, and our understanding is that while authors may at times put particular emphasis on the findings of their own studies, there is a general agnosticism concerning their relative importance. Characteristic of all three types of explanations of the low participation rate of developing countries – trade structure, legal capacity and power considerations – is that underdevelopment is at the root of the problem. But while underdevelopment is the primal

force behind all three explanations, different policy prescriptions seem to follow from the explanations. If limited participation is explained by legal capacity, or to some extent power considerations, there is a problem with the way in which the WTO DS system works, and efforts may be justified to remedy this. Indeed, the Advisory Center on WTO Law is motivated by the perceived effects of lack of legal capacity on behalf of developing countries. On the other hand, if the use of the system mainly reflects trade structure (i.e. low gross volumes), there is less of a need to change the current DS system. A crucial question thus seems to be whether developing country participation in the DS system as complainants mainly reflects these countries' trade structures or more directly their developing country status.

The purposes of this study are two-fold. One is to shed light on the empirical question concerning the determinants of developing country participation in the DS system. In doing this we offer a number of contributions vis-à-vis the current literature. The first is that we work with a dataset on dispute initiation that is significantly extended compared to what is employed in the current literature. Our data set contains all *Requests for Consultations* at the WTO from 1995 through the end of 2006 (i.e., the first full 12 years under the current DS system). This provides a much broader sample for identification of patterns than employed in most existing studies. The second contribution is that we examine the role of trade volumes in participation rates across broad industry sectors. The current literature generally focuses on aggregate trade volumes. Our focus on sector patterns lets us further deconstruct the composition of trade as a potential explanation of developing country participation rates. Finally, we attempt to directly confront the problems caused by the dominance of zeros in the data set (i.e., the dominance of country-product pairs without observed disputes within the DS system). The second purpose of the study is to highlight a number of fundamental conceptual and data problems that beset the whole empirical literature that seeks to draw some form of policy conclusions based on participation in the DS system. While perhaps appreciated by researchers working in this area, these problems appear to go unnoticed by practitioners drawing on this literature.

The paper is structured as follows. In Section 2 we provide an overview of the literature on the determinants of participation in the DS system. In Section 3 we develop our analytical framework for explaining participation rates. Section 4 introduces the data that will be used to highlight the validity of the analytical framework. This is followed in Section 5 by

an informal view on the data. Section 6 provides a formal (econometric) analysis of our data. Finally, in Section 7, we discuss our results and draw broader conclusions from the evidence.

2.   Background

In this section we review the literature on the determinants of participation as complainants in the DS system. This review will be in two parts. We first point to a number of fundamental conceptual problems facing the literature. We then discuss more directly the literature. But since it is by now fairly sizeable, we will here only briefly point to a few studies that are of more direct relevance to the present study.[1]

2.1 Conceptual issues

As mentioned above, there are a number of very serious conceptual problems facing the literature on developing country participation in the DS system. We will here point to some of them.

2.1.1 What is "a" dispute?

In order to analyze the degree of participation in the DS system, it is necessary to be able to count the number of disputes. This in turn requires a definition of the *unit of account* of a dispute. A fundamental conceptual problem faced by the entire literature is that of choosing the *unit of account* for disputes. That is, what is "a" dispute?

From a data point of view, the simplest approach is to count each *Request for Consultation* as a separate dispute. Each such request is assigned a DS number by the WTO Secretariat, and there were 351 such disputes through December 2006. This is the approach taken in most of the more legally oriented literature that has sought to quantify participation in the DS system.

Another possibility, followed in the more economics or political science related literature, is to identify *bilateral disputes*. On this view, each complainant (sometimes there is more than one complainant), is counted as having a dispute with the respondent. The

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[1] See Busch and Reinhardt (2002), or Horn and Mavroidis (2007), for a fuller account of the literature.

consequence of this is to increase considerably the total number of disputes. For instance, with this approach the *Bananas* dispute DS27 would count as five bilateral disputes, since in this case five countries complained.

But there are also other aspects that could be taken account of. For instance, a large number of countries request to join consultations. It is not entirely clear whether these countries join because their interests coincide with those of the original complainant(s) or respondent, but it seems plausible that in most actual disputes, the joining countries have been on the side of the complainant(s). Also, even though not so frequent, sometimes essentially the same dispute appears under different DS numbers. Should they be viewed as the same or different disputes? There is furthermore also the question of how to view the way in which issues are "packaged" under a single DS number. If a complaint concerns two different measures affecting a particular product, is this to be viewed as two separate disputes which are just for convenience attacked in one complaint?

It should be emphasized that there is no generally correct way of defining a dispute. What is important however is that the definition employed corresponds to the question asked. That is, the definition should be derived from an underlying theory. We are not aware of any such attempts to date, however. There is thus a huge conceptual void in the middle of the whole discussion concerning developing country participation in the DS system.

2.1.2 What defines the non-biased situation?

A second very serious issue for studies of biases in participation is how to define *the non-biased benchmark*. Without such a benchmark, it is impossible to say whether developing countries are "under-represented" or not. At the same time, most of the policy discussion on participation seems to completely ignore the issue. Again, there is a need for better, and more explicitly worded, theory.

2.1.3 Why are illegalities committed?

A third question of great significance is why countries commit illegalities? It makes a significant difference to the evaluation of the DS system if illegalities are committed to defuse domestic political pressures, or to aggressively pursue national or interest group interests. In the former case, the illegalities may prevent measures that would seriously threaten the unlawfully acting country's ability to maintain its commitments. There are

some attempts to address this issue in the theoretical literature, but there is very little empirical work on this issue, except for an interesting paper by Bown (2004b) who examines the determinants of countries' choices of whether to violate or adhere to GATT rules when making trade policy changes during rounds.[2]

2.1.4 What do observed dispute represent?

To date, there have been significantly less than 400 such disputes. At the same time countries have undertaken many millions of decisions with a trade impact, each of which is potentially the target of a complaint. A highly pertinent question is then what purpose these disputes achieve, and what can be learnt about the working of the system by looking at participation in the system? How do we explain the fact that these particular conflicts ended up as formal disputes at the WTO, while other conflicts did not? That is, what determines the *selection* of disputes that appear before the WTO? The registered disputes most likely differ from other trade conflicts. But *how* do they differ? About this we know almost nothing.

2.1.5 How do we interpret differences in participation?

A central issue is clearly how to interpret the observation that a group of countries has launched few complaints. Perhaps the mere threat of complaints from this group sufficed to keep its trading partners at bay, partly due to the efficiency of the DS system. Or alternatively, perhaps one does not find it worthwhile to pursue disputes due to the poor functioning of the system. Or maybe certain countries are more fearful that if they complain, respondents will retaliate in some form. The same observation may thus lead us to completely different conclusions. We are not aware of any theoretical or empirical literature to guide us as to which is the better interpretation.

2.2 The empirical literature on dispute initiation

The literature on developing country participation in the DS system has focused on three sets of explanations. The first is that participation reflects commercial interests of countries. But the literature has also pointed to participation costs, legal capacity, and power politics as factors in the pattern of DS participation. According to the power hypothesis, developing countries abstain from launching disputes due to fear that they either will not be able to

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[2] See Bown (2002), Bütler and Hauser (2000), Grinols and Perrelli (2003), and Guzman (2003).

enforce rulings in their favor, or will be subjected to some form of revenge from more powerful countries if they do complain against them. In contrast, the legal capacity hypothesis holds that it is the limited ability of developing countries to detect illegalities and to litigate if illegalities are detected, given resource constraints, which puts developing countries at a disadvantage.

2.2.1 Trade structure as a determinant of participation

As noted above, a basic concern in the literature has been whether smaller and poorer WTO Members complain less often than they "should". Of course, it is highly likely that a country that exports many products to many markets and in large volumes will encounter more illegalities than a country that exports a few products in limited amounts to a few markets. The crucial question for determining any bias in the system is then how many more disputes the country with larger and more diversified exports should be involved in. Clearly, in order to address this issue, there is a need for a definition of an unbiased benchmark. Lacking any other plausible theory for the number of illegalities committed by each country, Horn *et al* (1999) assume that countries are equally prone to commit illegalities, in the sense that they do this with the same frequency for each imported product. Using data for the first four years of the WTO DS system, and with products defined at the 4-digit HS level, Horn *et al* (1999) show that the actual distribution of bilateral disputes across members are fairly well predicted by this benchmark, in particular when the latter is adjusted in order to exclude exports with smaller values (assuming that such values are not worth litigating over). This finding would thus suggest that the reason for the discrepancy between developed and developing countries in terms of complaints mainly reflects differences in trade interests.

Several studies have significantly improved on this study, often coming to rather different conclusions in the process. Notably, Bown (2005) argues that the assumption in Horn *et al* (2006) that illegalities are randomly and uniformly distributed across markets, products and trading partners, is strong. In particular, illegalities may be committed more frequently against weaker countries that do not have the capacity to retaliate. To get around this selection problem, Bown (2005) focuses on the choice of countries to either pursue disputes by themselves, participate as co-complainants or as third parties, or not participate at all, possibly free-riding on the efforts of other countries. To this end, the study employs an ordered probit model, applied to data for the period 1995-2001. The data builds on the 116

disputes in which importing countries were determined to illegally restrict imports. Bown (2005) also identifies countries that were harmed by the illegal measure, but who did not participate in the legal process. It is shown that in disputes over measures that adversely affect many trading partners, the size of exports is positively related to the propensity to complain, in line with the finding of Horn *et al* (1999). It is also positively related to participation as a third party, and negatively related to the propensity to free ride.

2.2.2 Legal capacity and "power" as determinants of participation
Another important theme in the literature has been the role of limited legal capacity and limited economic "power" as restraints on developing country willingness to launch complains. The limited legal capacity of developing countries may prevent these countries from detecting illegalities, while their lack of "power" may make the enforcement of rulings to their favor difficult. It may also potentially result in retaliatory actions such as loss of preferential treatment status in trade (or more onerous rules of origin), or reduced foreign aid.

Horn *et al* use the size of countries' WTO delegations in Geneva as a proxy for countries' legal capacity and find that countries with more legal capacity litigate more, controlling for trade interests. However, this relationship is rather weak in their study. Dividing countries into four groups, G4, other OECD countries, developing countries other than LDCs, and LDCs, the study finds that developing countries other than LDCs are actually *over-*represented as complainants against both G4 countries and against other OECD countries. On the other hand, LDCs seem to be underrepresented as complainants against developed countries, but this finding is uncertain due to the very small share of LDCs in world trade. Bown (2005) also uses the size of Geneva delegations as a proxy for legal capacity, but the variable is insignificant.

Another study on this theme is that of Guzman and Simmons (2005), who consider bilateral disputes in the WTO between 1995 and April 2004, as defined by *Requests for Consultations*. In addition to the commonly employed variable capturing the size of countries' Geneva delegations, Guzman and Simmons (2005) include the number of embassies abroad, countries' non-military government expenditures, and an index for the quality of government bureaucracies. Overall, Guzman and Simmons (2005) see their results as supporting the primacy of the legal capacity rather than power as an explanation

of the choice of respondents. Because of legal resource constraints, developing countries are more selective as to which cases they challenge before the WTO.

The notion of "power" mentioned above is of course extremely vague, and could encompass a large number of aspects. As a measure of bilateral power relations, Horn *et al* (1999) use differences in GDP levels, but find little support for such a notion of power to matter. Bown (2005) uses two alternative measures of power. One of these is the trade retaliation capacity as proxied by fraction of the exporter's exports that goes to the importer. The estimated coefficient is positive, as expected, and significant.

One more specific aspect of power in international relations is the possibility for either party to withdraw foreign aid if faced by undesirable behavior by the other party. The role of aid for participation as complainants has been highlighted in a couple of studies. Bown (2005) includes bilateral aid in both directions. Bown (2005) argues that the more reliant an importing country is on the exporting country for development assistance, the more aid the exporting country could threaten to withdraw, and thus the more likely that the respondent would implement market-access commitments. However, Bown also notes that the respondent's reliance on aid from the exporter could indicate a special relationship between the two countries that might decrease the likelihood of complaints. The importer's bilateral aid dependence is measured by the aid received by the importer from the exporter as a fraction of the importer's national income. This variable is shown to be significantly negative, partly in contradiction with a power hypothesis.

Bown (2005) also examines the impact of the exporter's bilateral aid dependence. The coefficient for this variable, which is measured symmetrically, is shown to be significantly negative, as a power-based theory would predict. Hence, bilateral aid dependence reduces dispute participation, regardless of the direction of the aid.

A second study that illuminates the role of aid is undertaken by Zejan and Bartels (2006).[3] They examine two aspects of aid dependence. The specification of direct relevance to the present paper is one where the probability of country i launching a dispute against j is

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[3] While not addressing the same issue as is at stake here, it can be noted that Besson and Mehdi (2004) also highlight the role of aid, when examining determinants of whether developing countries win disputes. Basing their study on a sample of 40 disputes, and estimating a binomial probit model, they find among other things that dependence on bilateral foreign aid reduces the probability of winning a dispute against the donor.

higher the less aid i received from j, the higher the GDP of i, the more trade dependent is i and the larger is its legal capacity.[4] The data employed covers the years 1995-2001 and concerns trade between developing countries and the EU and the US, respectively. When using probit regressions to estimate the model for both the EU and the US, the authors find some, albeit week, support for the proposition that developing countries complain less when they are more aid-dependent. When running separate estimations for the EU and the US, the relationship with the EU is found to be influenced by such considerations, but not that with the US. However, a closer statistical examination does not suggest any structural differences in the relationship between aid and dispute initiation when comparing the EU and the US.[5]

2.2.3 Other factors explaining participation

The literature contains several alternative factors as explanations for developing country complaints in the DS system. For instance, a frequent finding is that countries tend to complain less against members of the same preferential trade agreement to which they themselves belong. (As an example, see Bown 2005).

Another explanation is sought in the political systems of the potential complainants. Reinhardt (2000) examines a number of aspects of this issue, one being whether democracies are more or less likely to complain before the WTO. A number of theoretical arguments can be made in either direction, so while it seems plausible that the political system may affect the propensity to complain, the direction is unclear. Reinhardt finds however, that the more democratic a state is, the *more* it will initiate disputes, controlling for the trading countries' relative size, and for one country's dependence on trade with the other. There is also a strong tendency for democracies to be targeted more often. One possible explanation is that democratic governments find it harder to resist demands for protection, and will therefore be more prone to be pressured into committing illegalities. Reinhardt also finds that a country is more likely to initiate disputes against trading partners

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[4] The other specification hypothesizes that the amount of aid received by a country i from a country j is lower, the larger the number of disputes that country i launch against country j, the lower the GDP per capita of i, and the less trade dependent i is. This specification thus attempts to capture how aid is used to punish poorer countries that do use the DSB.

[5] This examination is performed using a likelihood ratio test, which effectively compares the log likelihood scores of from the two separate maximum likelihood estimations to see whether there is a significant difference in the relationship between aid dependence and dispute initiation for the and the US.

that stand for large shares of the country's imports and exports, and also against countries that depend on it for their imports and exports, partly in line with what is found by Bown.

Yet another factor potentially affecting the propensity to initiate disputes is previous targeting for complaints. To capture such considerations, Reinhardt (2000) includes a binary variable indicating whether in the previous year the respondent initiated a dispute against the complainant. It is indeed found that a dispute in the previous year very significantly increases the probability of a dispute in the opposite direction the year thereafter. Bown also discusses the role of retaliation in several papers, finding support for its deterrent impact. (See Bown 2002, 2004a, 2004b). Yet another study with similar findings is that by Blonigen and Bown (2003), who employ disaggregated data from antidumping investigations

3.   Analytical framework

We are interested in the reasons why countries take trade conflicts to the WTO DS system for adjudication. Our motivation is the question of whether there is some "bias" in the extent to which countries use the system. In particular, we want to explore the extent to which trade structure can explain the number of disputes that developing countries launch, controlling for other factors associated with underdevelopment.

As noted above, a generic problem for the whole literature on the use of the DS system is arbitrariness in the definition of the unit of account of a conflict. As we see it, a *Request for Consultations* in the DS system could be seen as a "package" of conflicts in several dimensions. For instance, the same request typically mentions a number of legal provisions that are allegedly being violated, often indicating that what is called a "measure" in reality consists of a number of different decisions; Hoekman, Horn and Mavroidis (2007) provide some descriptive statistics regarding this aspect of the DS system.

In this study we unravel this packaging across two dimensions. Specifically, we treat *Requests for Consultations* as aggregating trade conflicts in two dimensions: over complainants, and over products. Before studying the determinants of dispute initiation, we need to "unpack" the data on DS disputes. To this end, we will assume, first, that each complainant participating in a request is involved in a bilateral dispute with the respondent

(which always is a single country). Second, we will assume that each industry that is involved in a DS dispute represents a separate dispute.

Before engaging in formal empirical analysis, it is necessary to first specify a theoretical or analytical framework spelling out how various factors may influence dispute initiation. We do this for two reasons. This first is simply that it ensures some rigor when we examine the data. In particular we will be able to refute the theory if the data turn out to tell another story than the theory we spell out here. Another reason to formalizing these relationships is that it allows us to show that the kind of implicit theory underlying the claims in much of the DS literature is much more elaborate, and special, than acknowledged.

Our framework, which will be concerned with litigation concerning import-restricting measures at an industry level, builds on a number of relationships. At a very general level, we stipulate that the number of complaints that an exporting country (indexed by i) has against an importing country (indexed by j), is larger:

(i) the larger the number of illegalities that country i detects that are committed by j against i; and

(ii) the larger the gains from pursuing a dispute when an illegality is identified.

We do not know how to measure directly either of these entities, and for this reason we need to go behind each of them, disentangling them into factors that are more readily measurable. We start by assuming that the number of illegalities that country i detects that are committed by j:

(i) increase with the number of illegalities that are committed; and

(ii) increase with the probability of detecting a typical illegality.

We observe neither of these entities, of course. It is here natural to follow the literature and assume that more realized exports are likely to impose a stronger pressure on local producers, all else given, and that one would for this reason expect a positive relationship between exports and the number of committed illegalities. But it could also be argued that a low export volume may signal that many illegalities are committed. On this view, there would be a negative relation between export values and number of committed illegalities

when we control for other factors. Our intuition suggests that the former factor normally dominates in the data. However, if we are to see a significant negative relationship, we at least have a plausible explanation.

We next turn to the probability that exporter i detects a committed illegality in j. In general terms, it seems reasonable to suppose that, for a given level of exports, the probability of detection increases in the legal capacity of the exporting country i. In the literature, it is in this context explicitly referred to as the capacity of official bodies, such as trade ministries, to detect illegalities. Of course, in practice the capacity of the private sector may be at least as important. We are touching here on a highly complex and under-researched area – the political economy of dispute initiation, and for practical purposes we need to stay with the simplistic description employed here.

Let us now turn to the gain for country i from launching a dispute against j. We assume that it is influenced by three factors:

 (i)   the probability that country i wins against j if an illegality is detected and litigated
(ii) the direct gain for country i if it wins in litigation against j
(iii) the expected retaliation by j

Again, we need to go behind each of these factors in order to specify a theory that can be confronted with data. To this end, we take it that (i) the probability that country i wins against j if an illegality is detected and litigated increases in the legal capacity of exporter i, and decreases in the legal capacity of importer j.

We also assume that (ii) the direct gain for country i if winning in litigation against j is larger the surplus from trade that is at stake (export value will be used as a proxy), and the better are the enforcement possibilities. The latter is assumed to increase in own national income and fall in that of the other country.

Finally, (iii) the expected retaliation by j is smaller the lower the potential cost of retaliation by importer j against exporter i. There are of course many forms that such retaliation could take. The literature has pointed to the tendency for retaliation in complaints, whereby a complaint by i against j is met by a complaint in the opposite direction. We will here focus

in particular on the developed-developing country dimension, and account for the possibility of withdrawal of aid as a disincentive for aid-receiving exporting countries to complain formally.[6][7]

The model described thus far does not have any explicit industry dimension. However, there are at least two ways in which the industry structure may enter the picture. First, the forces we have just described are likely to differ in strength across industries. Since countries differ in industry structure, they are for this reason likely to differ in their propensity to initiate disputes. Second, it seems intuitively plausible that the degree of conflict differs across consultation requests. Certain requests concern only a very specific issue, hitting only a narrow range of the potential trade between two countries, while other complaints concern measures that are much wider in their effects. To capture some aspect of this difference, we will define our disputes on an industry level (we will below describe exactly how this is done).

The model laid out above can thus be summarized as follows: The number of complaints by exporting country i against importing country j in industry g ($DISP_{ijg}$) is higher:[8]

- the greater exports of country i to country j in industry g (X_{ijg});

- the less the aid that j donates to i, as a share of i's national income ($\frac{AID_{ji}}{Y_i}$);

- the greater the legal capacity of exporter i (L_i);

- the less the legal capacity of importer j (L_j);

- the greater the national income of exporter i (Y_i); and

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[6] It would also be natural to include the withdrawal of preferential tariff treatment. However, as with preferential trading agreement, one would have to consider very carefully the real preference margin when taking account of rules of origin requirements, and the costs of verifying these. This requires a study on its own. (See e.g. Francois, Hoekman, and Manchin (2006) for such an attempt.)

[7] Another alternative is the power measure used by Bown (2005), discussed on page 10, which is the fraction of the exporter's export that goes to the importer. This can be used as a proxy for the importer's capacity for trade retaliation. However, since in our model this fraction also captures the probability that an illegality is committed, such a measure would be difficult to interpret.

[8] It could be hypothesized to be lower if the two countries are members of the same preferential trading agreement. However, these agreements vary hugely in terms of what they in practice entail. A satisfactory inclusion of a preferential trading agreement variable would therefore require a careful examination of the actual content of each bilateral match of countries with regard to preferential trading agreement that is far beyond the scope of the paper.

- the less the national income of importer j (Y_j).

Note on the last variable that there are clearly factors that work in opposite direction to what we discuss above. For example, higher income countries may pose a greater benefit from improved market access (pointing to a positive coefficient), while the probability of winning may also be reduced (pointing to a negative coefficient). It is also conceivable that it is easier to find co-complainants for larger markets.

While this specifies the explanatory variables we build on, and the direction in which they are expected to influence dispute initiation, the theory is still silent on specifically *how* the various factors enter – what type of mathematical relationship they stand in. To make the model amendable to statistical analysis we could impose more specific assumptions to describe *how* these variables are assumed to be interrelated. Needless to say, there are many theoretical specifications that could seem reasonable here, and it is not clear how to choose among these. Since this inevitably arbitrary choice of functional form may importantly affect the outcome of the investigation, the standard approach in the literature is to abstain from such a specification, and to let the variables enter in an additive fashion. However, unfortunately this approach does not solve the problem with arbitrariness, since also an additive representation is implicitly based on specific assumptions concerning the relationships between the variables. In this study we will use a different formulation than the standard additive model, for reasons to be explained below.

We believe that the theory laid out above is about as plausible as any other presented in the literature. But as is obvious from the discussion above, even a simple formulation where dispute initiation is partly determined by trade structure, partly by legal capacity and partly by power considerations, becomes very elaborate on closer examination.

4. Data

We turn next to our data. It is convenient to first describe our explanatory variables (trade flows, national incomes, aid flows, and legal capacity), before describing how we construct the variable to be explained – dispute initiation.

4.1 Country definitions

A couple of comments regarding the countries included in the data set. First, throughout the study, we will let "EC" denote EU-15, the members of the EU before the enlargement in May 2004. We will treat the few DS disputes where EU-15 countries have been quoted as respondents, as complaints against the EC.

Second, as will be discussed below, there is a problem with data availability with regard to certain countries. For two WTO Members we lack data completely – Chinese Taipei (Taiwan), and Liechtenstein – and these are omitted from the study. The latter has not been involved in any disputes at all, but the former has been complainant in 8 disputes.

Third, for certain issues we divide the WTO Members into broader groups, working with the seven groups listed in Table 1.

Table 1: Country classification

G2:	EC, US
EI:	Earlier Industrialized (non-G2 countries traditionally considered as industrialized)
NI:	Newly Industrialized
HID:	High Income Developing (exclusive of NIs), with GDP/cap > $4 000 according to UNCTAD
MID:	Medium Income Developing, with $800< GDP/cap < $4 000 according to UNCTAD
LID:	Low Income Developing (excluding. LDCs), with GDP/cap < $800 according to UNCTAD
CT:	Centrally planned or in Transition
LDC:	50 countries according to UN classification

The criteria mentioned in Table 1 are to be seen as indicative. The exact classification is given in Table 2. The general idea here is to distinguish between groups of countries that we believe might differ in a systematic fashion from each other, with regard to their incentives to initiate disputes. Most of the distinctions are hopefully fairly obvious, though like all classifications they can also be seen as somewhat arbitrary. The distinction between Newly Industrialized and High Income Developing countries is made to capture the

Table 2: Country classification

G2	NI	HID	CT
EC	Argentina	Antigua and Barbuda	Albania
US	Hong Kong - China	Bahrain	Bulgaria
	Israel	Barbados	China
EI	Korea	Brazil	Croatia
Australia	Malaysia	Brunei Darussalam	Czech Republic
Canada	Mexico	Chile	Estonia
Iceland	Philippines	Cyprus	Georgia
Japan	Singapore	Gabon	Hungary
Malta	South Africa	Kuwait	Kyrgyz Rep
New Zealand	Thailand	Macao - China	Latvia
Norway	Turkey	Oman	Lithuania
Switzerland		Qatar	Moldova
	MID	Saint Kitts and Nevis	Mongolia
LDC	Belize	Saudi Arabia	Poland
Angola	Bolivia	Trinidad and Tobago	Romania
Bangladesh	Botswana	United Arab Emirates	Slovak Republic
Benin	Colombia	Uruguay	Slovenia
Burundi	Congo		
Cambodia	Costa Rica	**LID**	
Central African Rep	Cuba	Armenia	
Chad	Dominica	Burkina Faso	
Dem. Rep. Congo	Dominican Republic	Cameroon	
Djibouti	Ecuador	Côte d'Ivoire	
Gambia	Egypt	Ghana	
Guinea	El Salvador	Guyana	
Guinea-Bissau	Fiji	Honduras	
Haiti	FYROM-Macedonia	India	
Lesotho	Grenada	Kenya	
Madagascar	Guatemala	Nicaragua	
Malawi	Indonesia	Nigeria	
Maldives	Jamaica	Pakistan	
Mali	Jordan	Sri Lanka	
Mauritania	Mauritius	Tanzania	
Mozambique	Morocco	Zimbabwe	
Myanmar	Namibia		
Nepal	Panama		
Niger	Papua New Guinea		
Rwanda	Paraguay		
Senegal	Peru		
Sierra Leone	Saint Lucia		
Solomon Islands	Saint Vincent & the Grenadines		
Togo	Suriname		
Uganda	Swaziland		
Zambia	Tunisia		
	Venezuela		

significant difference in e.g. technical sophistication of the industries of countries in the respective groups.

4.2 Trade, aid, and income data

With regard to the explanatory variables, in order to reduce the influence of missing values and of various stochastic shocks, we compute for each variable except for the dispute variable, a yearly average for the years 1998-2002 as long as data so permits. For the few instances where data have only been available for a subset of this period, we have computed averages for the available period.

Trade data are taken from COMTRADE. They nominally describe bilateral trade flows between all WTO Members at the 2-digit HS level. A significant fraction of data are missing – for the years 1998-2002 approximately 45% are missing, and we have to make adjustments in response to this significant lack of data. First, for some country combinations, we only have data for some years. In such cases, we then compute averages using whatever data are available for this period. Second, the COMTRADE data set only contains non-zero values, so there is of course a strong suspicion that whenever a number is missing, that there is no trade.[9] On the other hand, for certain countries, such as Pakistan or Taiwan, it is clear that there is trade with a number of countries, despite the fact that no trade is reported.

In order to account for these problems, we assume, first, that whenever a value is reported for total imports for a country j from a country i (in which case also a HS number is always reported), that for those HS 2-digit industries for which no imports are reported, imports are zero. The sum of all HS 2-digit imports equals in such cases total imports, due to the existence of a unspecified category HS 99. Second, in cases where there is no information at all concerning the imports from i to j, we omit the observation of this bilateral trade relation from the data set.[10] [11]

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[9] See Francois and Manchin (2007) on missing trade flows.

[10] To clarify, if imports by country j from country i are excluded, this is done for all HS categories. But such an exclusion does not mean that i cannot be recorded to import from j, nor does it affect i's or j's imports from other countries.

[11] The loss of data due to the lack of HS specification is relatively small, and in no instance exceeds 8% of total trade reported trade.

With 132 WTO Members in the data set there are 132 x 131 = 17,292 different bilateral pairs of import relations. With 15 different groups of industries, the total number of distinguishable bilateral import relations is 15 x 17 292 = 259,380. This is the number of records that our data set would include, if it were complete (excluding the two countries for which there are no data at all). However, due to the missing information, and the procedures described above meant to tackle this lacunae of information, the total number of records in our data set is 192,720.

Table A-1 in the Annex provides more detailed information on our data for trade structure, showing how each country's trade is distributed across our 15 industry groups.

Data on bilateral aid flows are taken from the OECD data base DAC Online, under the heading "2a Official Development Assistance". It is here expressed in terms of constant year 2005 $US.[12]

Finally, data on GDP at constant 1990 US dollars are taken from the UN Statistics Division[13], and these numbers are converted into constant 2005 $US.

4.3 Legal capacity

It is very common in studies such as the present one to include some measure of legal capacity. Unfortunately, there are no direct measures of legal capacity, so instead some form of proxy variable has to be used. Before presenting the proxy employed here, let us make a couple of more general comments.

First, the literature has often used national per capita income as a proxy for legal capacity. This is natural, but problematic. For instance, certain countries have a highly educated elite, with excellent knowledge of WTO law, while at the same time having very low per capita income. India is an obvious example.

Second, another common proxy is the size of countries' WTO delegations in Geneva. This measure is employed e,g, by Horn *et al* (1999). There are problems with this proxy for legal capacity as well. For instance, while WTO delegates can be seen as experts on WTO issues,

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[12] The data also contains some negative numbers, indicating repayment of earlier received, but unused, aid.
[13] Data is available at http://millenniumindicators.un.org/unsd/snaama.

they are typically not experts on legal matters concerning the WTO. In addition, the direction of causality, to the extent there is a correlation, is not clear. It may well be that countries have large delegations partly in order to handle the many disputes they invoke. That is, size of delegations is not necessarily exogenous to the number of complaints. We therefore believe that the size of Geneva delegations is a problematic measure of legal capacity. Instead we will use other measures that are more exogenous to the issue at stake here. These are discussed below.

Third, it should also be noted that in general, when using proxies for legal capacity that essentially measure the *quality* of the legal capacity, and not its available quantity, as an explanatory variable, it is important to take proper account of the dimensionality of the model. For instance, in our specification (as in most other similar attempts in the literature), we seek to explain the absolute number of disputes pursued between any pair of countries i and j, by (among other things) legal capacity variables (L_i) and (L_j). These latter variables should hence measure the *absolute* amount of legal capacity of the exporting and the importing country, respectively. Amorphous as this notion of legal capacity is, it seems plausible to be larger, all else given, the larger is the population and the higher is its level of education. Assuming that the level of education is proportional to national income per capita (denoted $YCAP_i$), the following would be a simple specification to capture this relationship: $L_i = POP_i \cdot YCAP_i$. But, since $YCAP_i = Y_i / POP_i$, the aggregate amount of legal capacity would simply be proportional to the income of the country:

$$L_i = POP_i \frac{Y_i}{POP_i} = Y_i .$$

That is, we should under this reasoning not use income per capita, but total income, as a proxy of the *absolute* amount of legal capacity of a country.

In this study we will use a proxy for the quality of legal capacity. The World Bank Worldwide Governance Research Indicators Dataset provides several such indices, as for instance those for Government Efficiency, Regulatory Quality, and Rule of Law. [14] It seems likely that the general quality of the legal system, which of course could be measured in a

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[14] Available at http://www.worldbank.org/wbi/governance/govdata.

large number of ways, is positively correlated with each of these measures. The data are provided for the years 1998, 2000 and 2002, and we calculate simple averages of these three years for each Member. Not surprisingly, the three World Bank indices are highly correlated (the correlations are larger than .8). We have chosen to use the Government Efficiency index. In order to take account of the above-mentioned problem that this index does not measure the total amount of legal capacity, but its quality, we multiply the index by the logarithm of GDP to construct our legal capacity measure.[15] [16]

The World Bank index provides numbers for the individual Members of the EU. In order to form an index value for the EC, we have weighted each country's value with the country's share of EU-15 GDP, for each year.

The resulting legal capacity index is provided in the Annex in Table A-2, in the column "Own legal capacity".

4.4 Dispute data

Dispute data are taken from the Horn and Mavroidis WTO Dispute Settlement Data Set, originally compiled in a World Bank project.[17] This data set has recently been updated to include all 351 WTO disputes – what we will denote "DS disputes" – initiated through the filing of a *Request for Consultations* at the WTO, from 1 January 1995 until December 31, 2006, and for these disputes it includes events occurring until this date. The data set covers exhaustively all stages of dispute settlement proceedings, from when consultations are being requested to the eventual implementation of the rulings. The data set contains several hundred variables, providing information on various aspects of the legal procedure. From this data set we will take information on the identity of the complainants and the respondents, and the Harmonized System classification of the products concerned.

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[15] It could be though that the inclusion of the log of GDP both in this index, and directly, will produce problems of multicollinearity in the econometric analyses to follow. However, as will be seen, this is not actually a problem.

[16] More precisely, the index is constructed such that it takes both positive and negative values (the average index calculated for the three years 1998, 2000 and 2002 vary between approx -1.83 and 2.5). It is transformed as follows:

$$L_i = \ln(Y_i) \cdot (GovEff_i + \mathrm{abs}(\min_{\forall k} GovEff_k))$$

[17] The data are available at the www.worldbank.org/trade. However, at the time of writing, the World Bank website does still not have the most recent version of this data set, which is what has been used for this study.

We transform the data in several ways. First, the conceptual framework to be used in this study concerns import measures. We therefore want to omit from the data set all disputes concerning export measures. From an economic point of view, it is difficult to determine whether a measure amounts to export promotion only, or also restrict imports, due to the interrelationship between markets. For instance, a measure that at the face of it appears as only enhancing exports, may in practice act as an import restriction in other markets. There is therefore a considerable degree of arbitrariness in the decision concerning which DS disputes to omit from the data. We have chosen to omit those DS disputes where the matter stated in the consultation request mentions export subsidization, leaving 333 DS disputes in the data set.[18] This procedure eliminates approximately 5% of the DS data.

Second, we want to define industry-specific disputes. The data set we draw on provides the HS number(s) that were mentioned in the *Requests for Consultations*. These data vary greatly in the number of products being mentioned and the HS level. For some disputes there is no specification at all of a HS number. This is sometimes due to the fact that the contested measure is of such a nature as to not apply to any specific product, but it can also reflect the fact that the complaint is not very specific. In contrast, for other disputes a very large number of HS numbers are provided, and sometimes at a very detailed level. To match our dispute data to trade data, we have to make changes to the data set in order to account for the fact that we do not have HS numbers for all disputes:

(i) We delete all DS disputes for which there is neither a HS number specified, nor a product description.

(ii) For those DS disputes where there is no HS number specified but a verbal product description is given, we try as far as possible to use these descriptions to classify the industry concerned, as long as they refer to one or several specific (2-digit) industries, and

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[18] The following DS disputes were omitted on the basis of this criterion: 35, 46, 70, 71, 103, 104, 113, 120, 127, 128, 129, 130, 155, 194, 222, 265, 266, and 276. The decision to omit export subsidies is admittedly arbitrary. For instance, the Brazil-Canada aircraft disputes are omitted from the data due to this, but not the Boeing-Airbus disputes. Even though the latter disputes concern imports to a larger extent than the former, they still seem fairly similar in nature. However, once we start making more discretionary decisions, we risk introducing other forms of bias into the material.

not more generic categories, (such as "manufactures"). In cases where both a HS 2-digit product is mentioned, and something more generic, we include only the former.[19]

(iii) In order to make the statistical analysis more practical, we aggregate the almost 100 HS 2-digit industries into broader groups of industries. Another reason for aggregating the industries is the fact that disputes seem to be HS-classified in very different ways. For instance, in textiles disputes many 2-digit industries are mentioned, while this is not as common for other products. There is unfortunately a significant amount of arbitrariness in any classification of this sort, while at the same time the the choice of classification may have importance for the empirical findings. [20] We have chosen to identify 15 different groups of industries, as listed in Table 3. A more detailed description is provided in Table A-3. The basic idea is thus that these groups of industries should be disparate enough so that a DS dispute involving two of them can be seen as effectively packaging two separate disputes. Our classification largely overlaps with the division in the HS system of the HS 2-digit industries into "sections".

Table 3: Grouping of HS 2-digit industries

HS-2 digit numbers	Notation	Very broad description
1-24	Agr	Agricultural prod.
25-27, 68-70	Mt1	Materials 1
28, 29, 31	Ch1	Chemical prod. 1
30, 33	Pha	Pharmaceuticals
32, 34-38	Ch2	Chemical prod. 2
39,40	Pla	Plastics and rubber
41-43, 64, 66, 67	Mt2	Materials 2
44-48	Woo	Wood (incl articles)
50-63, 65	Txl	Textiles
72, 73	Stl	Iron and steel
74-83	Met	Metals other than iron
84, 85	Mch	Machinery
86-89	Vhl	Vehicles
90-96	Man	Misc manufactures
49, 71, 97	Oth	Other

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[19] This eliminates the following DS disputes: 37, 45, 80, 82, 83, 115, 117, 124, 125, 160, 170, 176, 186, 196, 199, 201, 224, and 285.

[20] For instance, had we used instead a HS 4-digit level, there would have been many more disputes. However, it should be recalled that the same method is applied to all disputes, and that what matters to us is the *relative* distribution of the number of disputes.

This procedure implies that there are 319 "industry-specific bilateral disputes" (ISBD) in our data, each of which concerning one complaining country, one responding country, and one of the 15 groups of industries. Table A-4 lists the DS disputes from which these are formed and Table A-5 gives the complainants, and the industry groups involved.

Finally, Table 4 contains summary statistics for the variables in the data set.

Table 4: Summary statistics

	Obs	Mean	Std dev	Min	Max
Disputes (i,j,g)	192720	0.00	0.06	7.00	12.00
Legal cap exporter	192720	45.89	23.91	0.00	109.74
Legal cap importer	192720	48.27	22.88	12.11	109.74
ln(GDP exporter)	192720	23.61	2.21	19.25	30.01
ln(GDP importer)	192720	23.71	2.20	19.51	30.01
Aid dependence	192720	0.02	0.25	-0.20	10.68
ln(Agr)	192720	0.61	2.79	0	23.38
ln(Ch1)	192720	0.35	2.09	0	23.68
ln(Ch2	192720	0.36	2.05	0	22.54
ln(Man)	192720	0.45	2.27	0	23.96
ln(Mch)	192720	0.57	2.65	0	25.01
ln(Met)	192720	0.38	2.11	0	22.81
ln(Mt1)	192720	0.45	2.38	0	24.07
ln(Mt2)	192720	0.34	1.94	0	23.42
ln(Oth)	192720	0.33	1.90	0	23.11
ln(Pha)	192720	0.35	2.00	0	23.20
ln(Pla)	192720	0.43	2.26	0	23.04
ln(Stl)	192720	0.39	2.15	0	22.45
ln(Txl)	192720	0.52	2.49	0	23.69
ln(Vhl)	192720	0.39	2.16	0	24.80
ln(Woo)	192720	0.41	2.18	0	23.85
exposure	192720	10.04	2.81	1.06	12.00

5.   General patterns in the data

Given our data, we start with an overview of patterns in the distribution of disputes. This highlights that, as in the older data on which the earlier literature is based, we also observe a high correlation between indicators of size, development, export volumes, and participation in the DS process. A natural first step when approaching the question of the determinants of dispute initiation is to look at the extent to which it varies with certain

factors that it intuitively is likely to be influence by. We therefore start by looking at what is to be explained – the pattern of dispute initiation.

We first plot in Figure 1 each country's share of all WTO Members' exports against the number of ISBD disputes the country has been involved in. As can be expected, and repeatedly pointed out in the literature, there is indeed a very strong positive correlation between the two. Figure 2 demonstrates another well-known relationship, by plotting the (log of) national income against the number of complaints. Clearly, larger countries initiate more disputes.

Figure 1: For each WTO Member, Member's share of total exports against the number of industry-specific bilateral disputes for Member
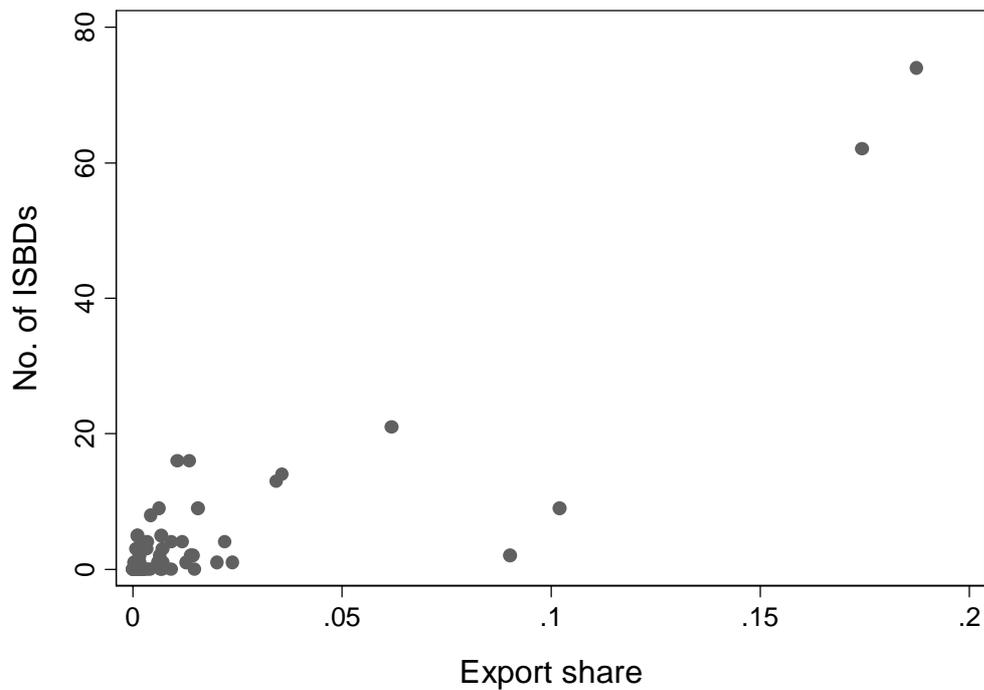
Figure 2: For each WTO Member, the logarithm of GDP against the number of industry-specific bilateral disputes for Member
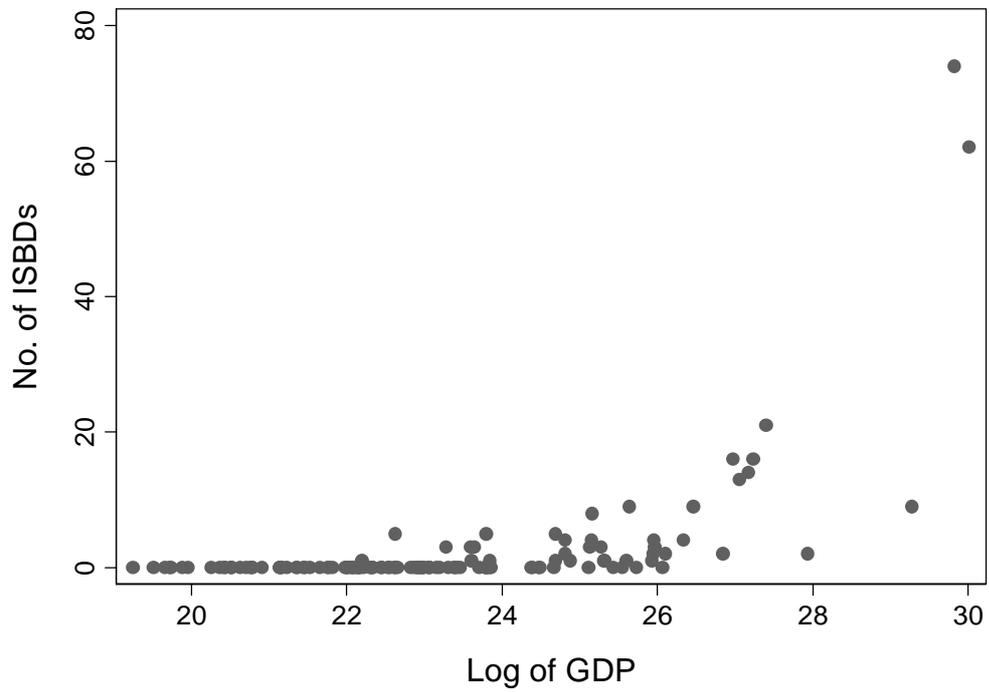
Figure 3 highlights the relationship between the legal capacity of each country and the number of ISBDs it has been involved in. Again, an expected pattern emerges, whereby countries with greater legal capacities are involved as complainants in more disputes.

Figure 3: For each WTO Member, the Member's legal capacity against the number of industry-specific bilateral disputes for Member
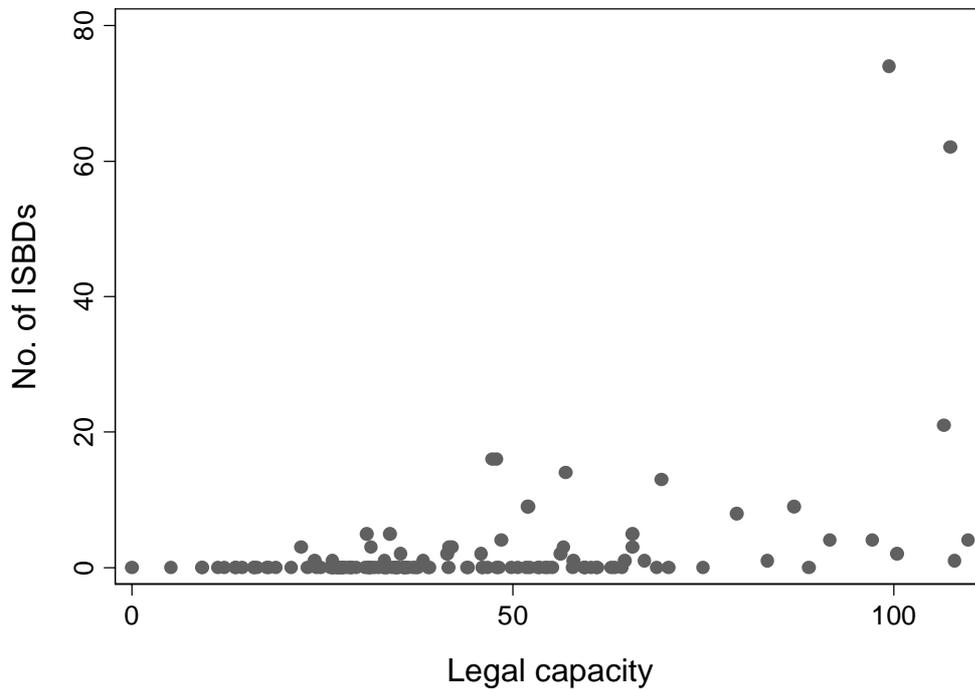
The relationship between aid flows and dispute initiation is summarized in Figure 4. It plots for each country i the aid received by i from all other WTO Members as a fraction of i's income, against the country's no of ISBDs. As can be seen, there is clearly a very strong negative correlation between the two entities: countries for which aid constitute a large fraction of national income typically initiate few or no disputes. (Note that this correlation does not mean causation.)

Figure 4: For each WTO Member, the Member's net receipt of aid from other WTO Members as a fraction of Members GDP against the number of industry-specific bilateral disputes for Member, for positive net receipts
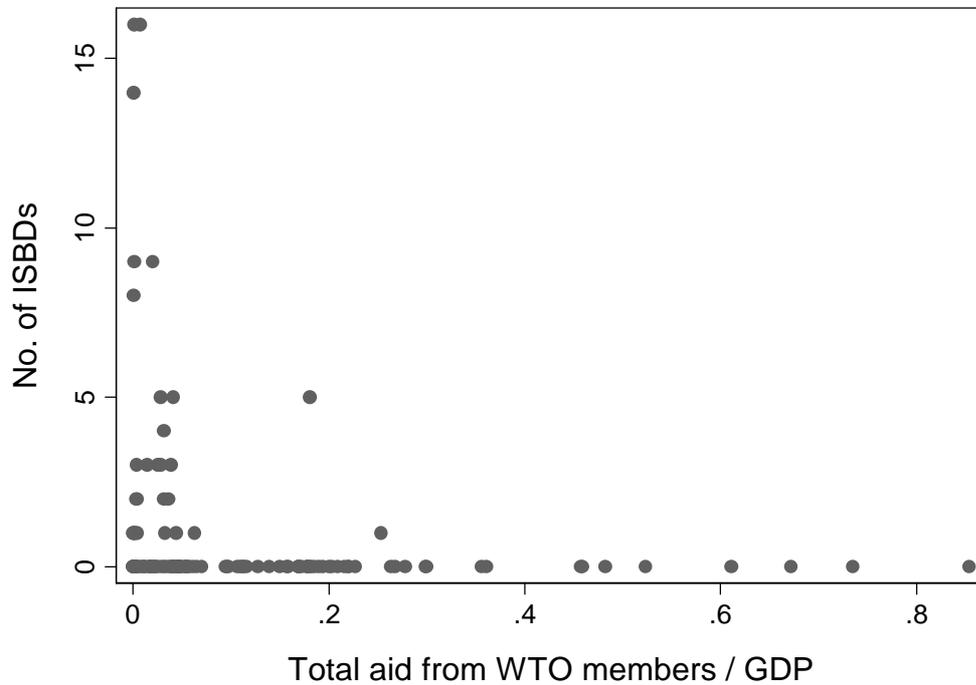
Let us next turn to the relationship between export structure, in the sense of the industries in which countries trade, and dispute initiation. It is natural to believe that certain industries are more likely to feature disputes than others, for instance because more concentrated industrial structures encourage more lobbying by industry. There are therefore reasons to believe that the difference between developed and developing countries in trade structure can explain at least part of the difference in dispute initiation across the two groups.

Figures 5 and 6 highlight the correlation between the export share of developing countries for the various HS 2-digit industries, and dispute initiation, in two slightly different ways. Figure 5 plots for each HS 2-digit industry, the developing country share of total exports in the industry on the horizontal axis, against these countries' share of the disputes involving this industry. The plot thus illustrates whether the industries in which developing countries have a large export share are those where they also have a large share of the disputes. There is (at least seemingly) not a very strong relationship between the two.

Figure 5: For each HS 2-digit industry, developing country share of total exports in the industry against their share of the disputes involving this industry
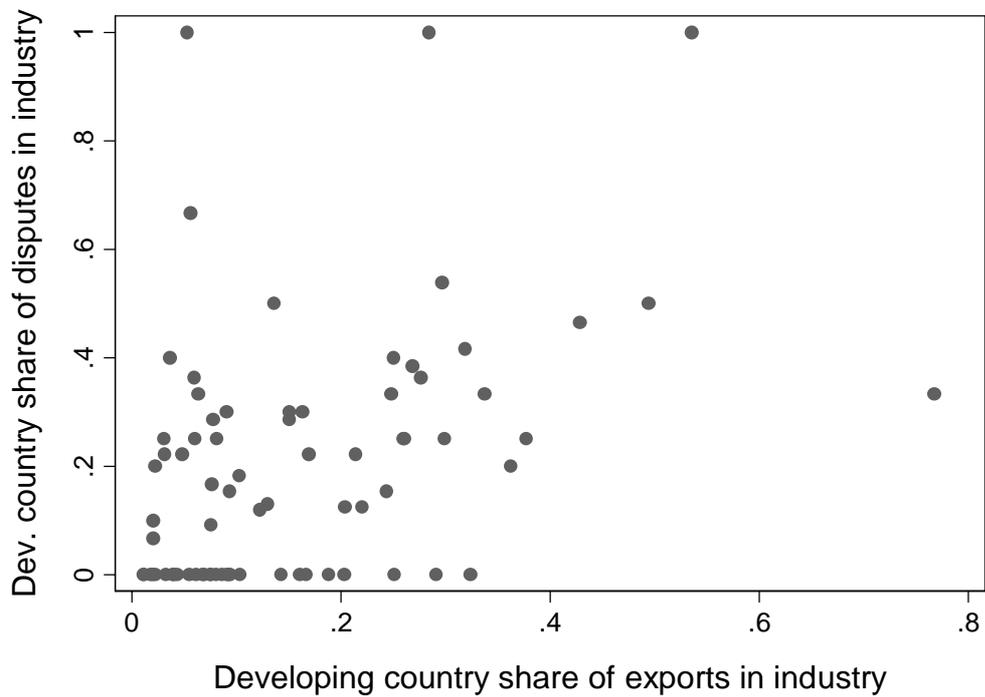
Figure 6 looks at the issue from a slightly different perspective. The horizontal axis is as in the previous figure, but now the share of exports for developing countries in each industry, is plotted against this industry's share of all disputes. This figure could thus be indicative of a situation where developing countries, relative to developed countries, export in industries where there is relatively little litigation. No such relationship can be discerned through this plot however. Hence, a superficial glance at the data suggests that any problem with developing country under-representation as complainants does not seem to be related to their export pattern across industries.

Figure 6: For each HS 2-digit industry, developing country share of total exports in the industry against the industry share of all disputes
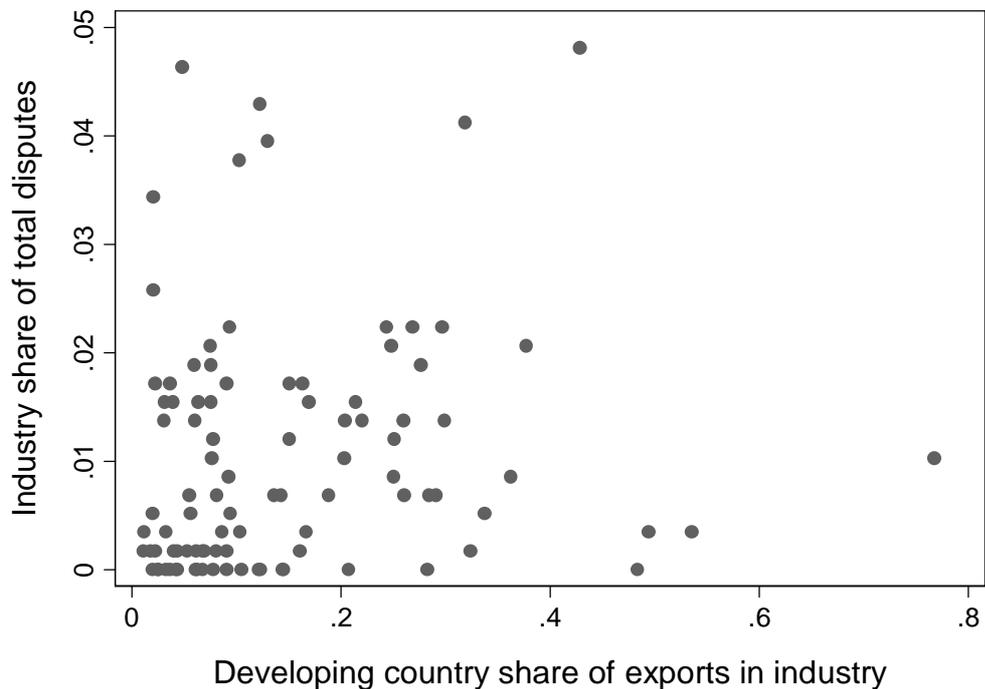
To conclude, it appears from the figures above as if dispute initiation is strongly positively correlated with trade values and with the size of GDP. It is also positively related to our measure of legal capacity, and negatively related to our measure capturing power considerations (aid dependence). But dispute initiation seems to vary less systematically with trade structure. We cannot stop the analysis here, however, for a number of reasons. First, the figures above say nothing about the direction of causality. Second, the lack of correlation between dispute initiation and trade structure does not necessarily imply that these are not interrelated when controlling for other factors. Third, even if dispute initiation is caused by the factors we have highlighted, the figures are not very informative with regard to the relative strength of the various factors. Furthermore, many of the factors we use to explain dispute initiation are just reflections of the same underlying factor, and they can all be said to reflect underdevelopment one way or the other. It would be clearly be desirable to disentangle the impact of the various factors, and to determine the relationship between them. To this end, we have to turn to econometric analysis.

6. Econometric analysis

An econometric analysis of the determinants of dispute initiation requires at least three components:

(i)   a hypothesis – or theory – for the determinants of dispute initiation;
(ii) a set of data on the variables of relevance; and
(iii) a statistical method for examining the extent to which the data supports the hypothesis.

We have already specified component (i) – for a working hypothesis, we rely on the conceptual framework spelled out in Section 3 – and (ii) – the data needed to analyze this framework were described in Section 4. As we have seen, there are potentially serious conceptual problems involved in any the specification of the theory in this area, and in the construction of the variables to be used when testing.

We now turn to component (iii). As will be argued, it will be highly important to choose a statistical method that suits the peculiar features of the data at hand. There are here two broad types of purposes that the analysis may seek to fulfill. One purpose of the analysis is that it should be analytical, explaining relationships of interest. The aim is then to find causal, or at least significant, relations. The main requirement on the model is to include all relevant variables, and the explanatory variables have to be exogenous. The other purpose is descriptive, often with the hope of making prediction. The main requirement on the model is then that it has a good ability to predict. The present study can be said to combine elements of both these approaches, by emphasizing the desirability of estimating significant relationships, at the same time as using the model for predictions.

6.1 The choice of statistical model

A natural starting point when seeking to disentangle the relative influence of different factors is to use multiple ordinary least squares (OLS) regression analysis. The basic version of the OLS model posits a linear relationship between the dependent and the explanatory variables. However, a fundamental feature of dispute initiation data is that it is "count data" – it takes on only non-negative integer values (0, 1, 2… etc.). In addition, there is a heavy dominance of zeros for the ISBD variables: for the 192,720 observations we have in the data, there are disputes observed in only approximately 0.1% of the instances. Hence, roughly 99.9% of the variable to be explained consists of zeros. As a

result, when using the linear OLS model, the errors will not be normally distributed, and the model is consequently unsuitable.

Note that the dominance by zeros in the data set is not special to our data set, but is simply a reflection of the small number of disputes in the DS system relative to the number of potential complainant/respondent pairs. Even if one abstained from disaggregating disputes according to industry group, there would still be a heavy dominance by zeros. As can be seen, it requires special methods for the few disputes that are in the data set, not to "drown" in all the zeros in the estimations.

A very common attempted remedy to the problems caused by the skewed distribution of the dependent variable, which is a characteristic of count data, is to let the dependent variable (here the number of disputes) enter in logarithmic form, in order to make the distribution of the error term closer to the normal distribution. However, this would not suffice in the present case. Instead, there is a need to employ a statistical model that is designed to take account of the particular features of count data. A natural candidate here, which we will also adopt, is the *negative binomial regression model*. This model is in theory, and normally also in practice, much better suited to handle problems arising from count data than is the linear OLS model.[21] [22]

The negative binomial model we will estimate has the following underlying specification:

$$E(DISP_{ijg} \mid z'\beta, t) = t \cdot \exp(\beta_0 + \sum_g \delta_g \beta_{1g} \ln X_{ijg} + \beta_2 L_i + \beta_3 L_j + \beta_4 \ln Y_i + \beta_5 \ln Y_j + \beta_6 \frac{AID_{ji}}{Y_i} + \varepsilon_{ijg})$$

t is the length of time both i and j have been members, and δ_g are dummies taking the value of one when the industry group concerned is g, and is otherwise equal to zero.

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[21] See e.g. Cameron and Trivedi (1998) for an exposition on econometric methods for count data.
[22] The negative binomial model nests as a special case the Poisson count model. But it is on *a priori* grounds better suited than a standard Poisson model for the situation at hand, both since it is can better handle situations with many zeros, and since it can handle problems of over-dispersion (i.e., situations where the variance exceeds the conditional mean), both of which are inherent features of our data. Also, if there are problems with omitted variables (as in our case), that will translate to a larger error term, in effect resulting in over-dispersion. Our estimations will confirm the choice of the negative binomial model over the standard Poisson model.

At risk of explaining the obvious, let us just say that the point of the estimation is to find values of the coefficients $\beta_0, \beta_{1,Agr}, ..., \beta_{1,Woo}, \beta_2, ..., \beta_{066}$ such that the model on the basis of the explanatory variables on the right-hand side of the equation, predict dispute initiation across triples of (exporter, importer, industry group) as closely as possible to actual dispute initiation (the variable on the left-hand side). Having determined these coefficients, and assuming we trust the values thus calculated, we would from the magnitude of these values know the influence of each of the explanatory variables.

6.2 The estimated model

Table 5 gives the results of the estimation of the negative binomial regression model.

Table 5: Estimation of the negative binomial regression model

Number of observations	192720	Log pseudolikelihood =	-994.264
Dispersion =	mean	Prob > chi2 =	0
Wald chi2(20) =	1220.14		

(Robust standard errors, adjusted for 132 clusters in comp)
Dependent variable: No of ISBD   exposure   (exposure)

	Coef.	Std. Err.	z	P>|z|	[95% Conf. Int.]	
Legal cap exporter	-0.01	0.00	-1.45	0.15	-0.01	0.00
Legal cap importer	-0.02	0.00	-4.66	0.00	-0.03	-0.01
ln(GDP exporter)	0.29	0.06	4.74	0.00	0.17	0.42
ln(GDP importer)	0.55	0.07	8.06	0.00	0.41	0.68
Aid dependence	-3.28	1.21	-2.71	0.01	-5.66	-0.90
ln(Agr)	0.60	0.05	12.38	0.00	0.51	0.70
ln(Ch1)	0.49	0.05	8.83	0.00	0.38	0.59
ln(Ch2)	0.48	0.06	8.71	0.00	0.38	0.59
ln(Man)	0.40	0.06	6.69	0.00	0.28	0.52
ln(Mch)	0.48	0.05	10.41	0.00	0.39	0.57
ln(Met)	0.42	0.06	6.63	0.00	0.30	0.54
ln(Mt1)	0.47	0.05	9.44	0.00	0.38	0.57
ln(Mt2)	0.53	0.05	11.26	0.00	0.44	0.62
ln(Oth)	0.46	0.06	8.29	0.00	0.35	0.57
ln(Pha)	0.52	0.05	9.53	0.00	0.41	0.63
ln(Pla)	0.46	0.06	8.06	0.00	0.35	0.57
ln(Stl)	0.55	0.05	10.72	0.00	0.45	0.65
ln(Txl)	0.52	0.05	10.60	0.00	0.43	0.62
ln(Vhl)	0.53	0.05	10.67	0.00	0.43	0.63

ln(Woo)	0.51	0.05	9.35	0.00	0.40	0.62
_cons	-36.80	2.33	-15.79	0.00	-41.36	-32.23
exposure	(exposure)					
/lnalpha	0.85	0.33			0.21	1.49
alpha	2.34	0.76			1.24	4.43

Let us first note that the legal capacity of the exporter is the only coefficient that is insignificant – all other parameters are significant at the 1% level (or better). The coefficient for legal capacity of the importing country is significant however, and negative as the theory predicted: higher-capacity importers tend to face fewer disputes. This part of the "legal capacity hypothesis" discussed in Section 2 is thus confirmed.

As always in these instances, it is hard without much further examination to determine the reason why the legal capacity of the exporting country is insignificant.[23] But a natural possibility is of course that the proxy does not perform very well with regard to capturing relevant aspects of legal capacity. Note, however, that the exporter's legal capacity *is* positively correlated with dispute initiation, as illustrated in Figure 3. An alternative explanation for the lack of significance is that legal capacity is defined through GDP, and thereby highly correlated with the latter. The expected effect of this multicollinearity is precisely that of reducing significance levels. However, even with the GDP variable omitted, exporter's legal capacity is still not significant. Note further that this multicollinearity problem notwithstanding, the importer's GDP and legal capacity are both significant with opposite signs.

There is indeed a seemingly widespread view in the literature that the measures for legal capacity that are available are all rather poor indicators. Hopefully, the survey work that Busch, Reinhardt and Shaffer (2007) has recently been conducting will provide researchers with better information on the exact nature of developing country lack of legal capacity in the WTO system.

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[23] In contrast, this variable tends to be more significant in the OLS regressions. We can also note that in the present estimation, it also takes on the wrong sign, suggesting that more legal capacity should reduce the expected number of disputes. The latter may at first seem highly counterintuitive. But a possible interpretation of such relationship would be that countries with significant legal capacity deter trading partners from committing illegalities, and therefore face fewer illegalities than countries with less legal capacity. We are for several reasons not convinced about the validity of this argument, however.

Before turning to the other variables, let us just mention that because of the non-linear nature of count models such as this one, the interpretation of the coefficients is a bit more complicated than in the case of e.g. standard OLS, and these matters are further complicated by the fact that our explanatory variables sometimes are in log form. In the case where the explanatory variable appears in log form, the interpretation is simply that of an elasticity: a coefficient value of k for the explanatory variable x implies that a one percent change in x changes the number of ISBDs by k percent.

With regard to the other explanatory factors examined in the estimation, the theory predicts that exporters with higher GDP tend to initiate more disputes, since higher GDP tends to make enforcement easier, which in turn should tend to increase the expected benefit from pursuing a dispute. The estimated model confirms this hypothesis. Note however that this is not simply capturing a size of exports effect, since exports and its decomposition, enter separately in the regression.

But the size of the importer's GDP also positively affects dispute initiation, contradicting the idea that enforcement is made more difficult by a larger respondent. The latter can plausibly be explained by a weakness in our theory above. It could be argued that larger respondents on average have larger latent import demand, and that all else given, the expected gain from complaining against such a country therefore is larger. A larger market is also likely to be the target of other countries' complaints. This makes it more likely to be the subject of complaints by other countries, in which case it would be easier jointly file a *Request for Consultations*. It can be noted that importing country GDP not only enters with the wrong sign, but also that the effect is important quantitatively speaking: the positive impact of importing country GDP on expected dispute initiation is in absolute terms larger than the impact of exporting country GDP. These results, taken together with the significantly negative impact of the importer's legal capacity on dispute initiation, are in line with the findings by Guzman and Simmons (2005) that legal capacity seems to be more important for the choice of respondent than "power considerations".

The coefficient for the variable capturing the bilateral aid dependence of the exporter is negative, as theory predicts. The regression thus *prima facie* seem to confirm that aid

dependence may be a disciplining factor on dispute initiation, as discussed above.[24]
However, this effect seems implausibly large, most likely due to an endogeneity problem
inherent in our econometric model – aid dependence will in effect serve as a general proxy
for underdevelopment and may therefore capture various factors influencing the propensity
to initiate disputes. In particular, high aid dependence is likely to be correlated to
preferential tariff treatment by richer countries. Consequently, the significant coefficient for
aid dependence has two interpretations: it may signal the existence of power politics –
donor countries bully the recipient countries not to react on illegalities – or it may signal
absence of illegalities correlated to aid dependence, due to preferential treatment. The
estimated coefficient will capture both of these effects. It should be noted that this
endogeneity problem is not particular to our model, but is inherent in any model that does
not control for preferential treatment (including, for example, Zejan and Bartels (2006)). In
addition, since the absolute majority of the observation for disputes and aid are zero, the
small existing variation in these variables will make the results sensitive to outliers and
omitted variables.

Let us now turn to trade structure. We first note that all the coefficients enter with the
expected positive sign. Hence, for each industry, holding the level of exports in other
industries constant, more exports are likely to be associated with more dispute initiation.
But we can also see that industries differ in the extent to which trade volumes can be
expected to increase dispute initiation. The grouping "Agr" stands out as the industry group
with the highest propensity, and it can be shown that the coefficient is significantly larger
than the other coefficients.[25] The industry group with the lowest propensity is "Man,"
where a certain proportional increase in the trade volume is likely to generate two-thirds as
many more disputes compared to Agr. We thus conclude that countries' structure of trade
across sectors actually is likely to affect their propensity to initiate disputes. We will return

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[24] As a side remark, if we instead of complainants who initiated disputes consider countries that only filed a
request to join consultations, aid dependence is not significant. Hence, the deterrent effect of aid dependence
only has a bite for countries that participate in the original *Request for Consultations*.
[25] This can, for example, be examined by instead running the regression with trade variables

$$\ln X_{ijg} + \sum_{g \neq Agr} \delta_g \beta_{1g} \ln X_{ijg}$$

where the second term now measures the divergence from the base case (which is taken to be Agr) for the
dispute sensitivity on trade. This formulation is economically and econometrically equivalent to the one
employed in the paper, but gives test statistics that directly tell whether an industry is significantly different
from the base case. This will be the case whenever its coefficient β_{1g} (for g different from Agr) is
significantly different from zero.

to this issue below.

Finally, we note that it can also be shown that the model as a whole is significant at the 1% level.[26] [27]

6.3 Model predictions concerning participation in the DS system

Having broadly presented the role of the various explanatory factors as suggested by the estimated model, we will now use the model to predict several aspects of participation.

6.3.1 Which countries does the model suggest as being over/under-represented as complainants?

The purpose of the estimation is to determine the set of coefficient values for the different explanatory factors that makes the model predict as closely as possible the actual numbers. In this exercise we are constrained by the mathematical properties that are imposed by the statistical model. The estimation thus determines the set of parameter values that would most likely give rise to the observed data, given the mathematical structure imposed by the statistical model (the negative binomial model, etc.).

In a certain sense, the coefficients can be said to represent the "average" impact of each explanatory factor. That is, they are not determined so as to completely predict a particular observation, such as the impact of Chile's exports in industry group Agr to the US on the expected number of dispute initiations by Chile against the US in this industry group Agr. Instead, the estimated coefficient for Agr will reflect the impact across all bilateral country pairs involving exports of Agr. We can therefore use the difference between the actual number of ISBDs and the predicted number of such disputes for different countries, and in particular country groups, as an indication of whether the country or country group is "under-represented" or "over-represented" with regard to dispute initiation, relative to this "conditional average."

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[26] As suggested by Pregibon (1980), a model specification test can be done by running a negative binomial regression of the actual ISBD variable on fitted values and squared fitted values. If the latter are significantly different from zero there are indications of a specification error. In this case the p-value is 0.38, indicating no model specification error. There are reasons to believe however, that there are omitted variables.

[27] As mentioned, the Poisson model is a simpler version of the model employed here, but cannot handle situations with over-dispersion. Indeed, the estimated dispersion parameter is significantly positive (see Table 5), confirming the decision not to use the Poisson model.

Table 6 gives the actual ISBD for each country, and the number that is predicted according to the negative binomial model. As the Table shows, the model performs well in the aggregate in that it predicts only six more disputes than what the data set actually contains. The Table suggests that among the group of "overrepresented" countries are Canada, the EC, Hungary, and the group of Latin-American countries including Chile, Guatemala, Honduras, Mexico, and Panama. At the other end of the spectrum are Australia, China, Japan, Malaysia, South Africa, and Thailand, all of which initiate fewer ISBDs than the average country would given the characteristics of their situation. The US is neither over- or underrepresented here.

Table 6: Actual and predicted number of IBSD by country according to the negative binomial model

Country	Act.	Pred.	Diff	Country	Act.	Pred.	Diff	Country	Act.	Pred.	Diff
Albania	0	0.0	0.0	Gabon	0	0.1	-0.1	New Zealand	4	2.9	1.1
Angola	0	0.1	-0.1	Gambia	0	0.0	0.0	Nicaragua	1	0.1	0.9
Antigua & Barb.	0	0.0	0.0	Georgia	0	0.0	0.0	Niger	0	0.0	0.0
Argentina	9	8.6	0.4	Ghana	0	0.1	-0.1	Nigeria	0	1.0	-1.0
Armenia	0	0.0	0.0	Grenada	0	0.0	0.0	Norway	4	3.9	0.1
Australia	2	8.5	-6.5	Guatemala	5	0.7	4.3	Oman	0	0.2	-0.2
Bahrain	0	0.2	-0.2	Guinea	0	0.0	0.0	Pakistan	3	1.4	1.6
Bangladesh	1	0.7	0.3	Guinea-Bissau	0	0.0	0.0	Panama	3	0.5	2.5
Barbados	0	0.1	-0.1	Guyana	0	0.0	0.0	Pap. New Guinea	0	0.1	-0.1
Belize	0	0.1	-0.1	Haiti	0	0.0	0.0	Paraguay	0	0.4	-0.4
Benin	0	0.0	0.0	Honduras	5	0.2	4.8	Peru	2	1.4	0.6
Bolivia	0	0.2	-0.2	Hong Kong – Ch.	1	3.2	-2.2	Philippines	4	2.3	1.7
Botswana	0	0.1	-0.1	Hungary	5	1.2	3.8	Poland	3	2.0	1.0
Brazil	16	15.2	0.8	Iceland	0	0.6	-0.6	Qatar	0	0.2	-0.2
Brunei Daruss.	0	0.1	-0.1	India	16	9.1	6.9	Romania	0	0.7	-0.7
Bulgaria	0	0.7	-0.7	Indonesia	2	6.3	-4.3	Rwanda	0	0.0	0.0
Burkina Faso	0	0.0	0.0	Israel	0	1.9	-1.9	St Kitts & Nevis	0	0.0	0.0
Burundi	0	0.0	0.0	Jamaica	0	0.4	-0.4	Saint Lucia	0	0.0	0.0
Cambodia	0	0.0	0.0	Japan	9	23.9	-14.9	St Vinc. & Gren.	0	0.0	0.0
Cameroon	0	0.2	-0.2	Jordan	0	0.1	-0.1	Saudi Arabia	0	0.2	-0.2
Canada	21	16.2	4.8	Kenya	0	0.3	-0.3	Senegal	0	0.1	-0.1
Central Afr. Rep	0	0.0	0.0	Korea	13	10.9	2.1	Sierra Leone	0	0.0	0.0
Chad	0	0.0	0.0	Kuwait	0	0.4	-0.4	Singapore	1	2.7	-1.7
Chile	8	3.4	4.6	Kyrgyz Republic	0	0.0	0.0	Slovak Republic	0	0.4	-0.4
China	2	11.0	-9.0	Latvia	0	0.1	-0.1	Slovenia	0	0.4	-0.4
Colombia	3	2.6	0.4	Lesotho	0	0.0	0.0	Solomon Islands	0	0.0	0.0
Congo	0	0.1	-0.1	Lithuania	0	0.1	-0.1	South Africa	0	4.0	-4.0
Costa Rica	3	1.6	1.4	Macao - China	0	0.2	-0.2	Sri Lanka	1	0.7	0.3
Croatia	0	0.2	-0.2	Madagascar	0	0.1	-0.1	Suriname	0	0.0	0.0
Cuba	0	0.5	-0.5	Malawi	0	0.1	-0.1	Swaziland	0	0.1	-0.1
Cyprus	0	0.1	-0.1	Malaysia	1	4.6	-3.6	Switzerland	4	4.9	-0.9
Czech Republic	1	1.1	-0.1	Maldives	0	0.0	0.0	Tanzania	0	0.2	-0.2
Côte d'Ivoire	0	0.6	-0.6	Mali	0	0.0	0.0	Thailand	9	6.2	2.8
DR Congo	0	0.0	0.0	Malta	0	0.2	-0.2	Togo	0	0.0	0.0
Djibouti	0	0.0	0.0	Mauritania	0	0.0	0.0	Trinidad and Tob.	0	0.3	-0.3
Dominica	0	0.0	0.0	Mauritius	0	0.2	-0.2	Tunisia	0	0.2	-0.2
Dominican Rep.	0	0.7	-0.7	Mexico	14	11.1	2.9	Turkey	2	4.5	-2.5
EC	74	61.8	12.2	Moldova	0	0.0	0.0	US	62	63.1	-1.1
Ecuador	3	1.1	1.9	Mongolia	0	0.0	0.0	Uganda	0	0.1	-0.1
Egypt	0	0.9	-0.9	Morocco	0	0.7	-0.7	Un. Arab Emir.	0	1.2	-1.2
El Salvador	0	0.3	-0.3	Mozambique	0	0.1	-0.1	Uruguay	1	1.0	0.0
Estonia	0	0.1	-0.1	Myanmar	0	0.5	-0.5	Venezuela	1	2.1	-1.1
FYROM-Mac.	0	0.0	0.0	Namibia	0	0.1	-0.1	Zambia	0	0.0	0.0
Fiji	0	0.2	-0.2	Nepal	0	0.0	0.0	Zimbabwe	0	0.4	-0.4

For better overview, Table 7 aggregates the figures in Table 6 over each of the seven country groups we defined in the above:

Table 7: Actual and predicted number of IBSD according to negative binomial model

Country group	Actual ISBD	Pred. ISBD	Diff
G2	136	125	11
EI	44	61	-17
NI	54	60	-6
CT	11	18	-7
HID	25	23	2
MID	22	21	1
LID	26	14	12
LDC	1	2	-1
Tot	319	325	-6

According to this broader picture, the "over-represented" groups are G2 (specifically, the EC), and in proportion to their actual number of ISBDs, in particular the low income developing countries. Three groups of countries are less active as complainants than what is suggested by the volume and pattern of their trade etc: Early Industrialized countries, Countries in Transition, and the Newly Industrialized countries. Again, it should be emphasized that "over-" and "under-representation" are to be seen relative to the estimated model, not necessarily to an "objective" benchmark.

A few specific remarks about the LDC group are in order. First, in terms of the absolute numbers of disputes, the model does a better job at predicting the actual number of disputes for LDCs than for any other group. Second, the predictions also illustrate intrinsic problems with the kind of approach taken here, as well as in the rest of the literature, when it comes to evaluating the degree of LDC under-representation. The model suggests that LDCs should have 100% more disputes than they have had, and this group is in this sense actually the most under-represented group among the 7 in the study. However, intuitively it seems to be a different matter for a group of countries to increase the number of complaints from say 40 to 80, than from 1 to 2. Also, intuition suggests that the very small number of disputes involved in the case of LDCs leave much more room for randomness than is the case for the other groups, partly since the number of actual disputes has to be an integer number. (Had for some reason LDCs had two complaints, their participation would suddenly be twice as large.) In particular, a transition from zero disputes to one dispute intuitively seems to contain special considerations, due to threshold effects. Our bottom

line is that while these kinds of models seem able to fairly accurately predict the broader patterns of dispute initiation, they are not suited to determine whether LDCs should on the basis of their trade patterns, legal capacity, etc, have say two or three disputes, rather than one.

6.3.2 What is the impact of LDC country size on dispute initiation?

LDCs differ from richer countries in several ways, and each difference may have an impact on dispute initiation. A recurring theme in the literature is the question of whether developing countries participate less as complainants compared to richer countries because of smaller commercial interests, or because of more "structural" factors. The results from the negative binomial model indeed suggest that there is more to the issue than just aggregate trade volume or aggregate bilateral trade volumes. In particular, it was seen that absolute size of the trading economies matters beyond what is captured by trade volumes, and second, that trade structure across industry groups also seem to matter. In this and the next subsection we use the estimated model to shed further light on these issues.

An important aspect of LDCs is that they simultaneously harbor a number of features that alone are each likely to give rise to a low level of dispute initiation: small export volumes, small GDP, legally competent trading partners, aid dependence, etc. There is a strong suspicion on our part that these factors do not only individually contribute to low levels of dispute initiation, but also that they may interact in important ways. Intuitively, the joint effect of the weaknesses is larger than what the "sum of the individual weaknesses" would suggest. One way of examining this issue would be to answer the following question: suppose that all LDCs were merged into an "LDC Union" for the handling of complaints in the DS system. The union would be instructed to base its decisions concerning litigation on the combined exports of its members, and would draw on the combined resources of the countries in other respects. How would this affect the total number of complaints initiated by LDCs? Clearly, in order to answer this we cannot simply consider the simple correlations that the graphs above represent. We need to understand the interplay between the various factors determining dispute initiation. Hence, a relatively simple – but erroneous – way of addressing this issue would be to examine the relationship between export values and dispute initiation for richer countries. Having established this relationship, one could plug in the exports of the LDCs to obtain a certain number of disputes, which most likely would be larger than the actual number of disputes for the

LDCs. The problem with this method however, is that it does not take into consideration the fact that the richer countries not only have different trade patterns, they are also different in other respects, such as legal capacity, relative power, etc, aspects that the model has shown to matter.

One possible approach to answer the question of what impact the formation of the LDC Union would have is to use the estimated model to compute how much trade such a country would have. We want to emphasize that our calculations are here only meant to be illustrative of the type of analysis that can be performed, with an estimated model of the kind we have here. In order to have full confidence in the actual numbers, much more detailed work is necessary than we have been able to undertake here. In particular, if there are omitted variables that are correlated with the regressors, these are implicitly assumed to change as the value of the regressors change.

Should one not expect the LDC Union to simply initiate the same number of disputes as the LDC do together in its absence? The answer is no, given the non-linear properties of the model. In order to avoid a technical description, let us just say there are forces suggesting that the LCD Union would initiate fewer disputes; for instance, with the coefficients for the export volumes of the various industry groups smaller than unity, the expected number of ISBDs are increasing at a decreasing rate in the volume of any particular industry. Also, intra-LDC trade is not accounted for, which reduces total trade values. On the other hand, because of the interaction between the different explanatory factors, there are tendencies for the opposite.

In order to assess the implication of the formation of the LDC Union we assume more specifically the following. The trade flows are for each industry group, the sum over all members of the LDC Union, excluding of course trade between the LDCs. The GDP influencing its decisions is the sum of the GDP of the individual members. To compute a legal capacity index, we first compute a weighted average of the Government Efficiency variable, using GDP shares. This index is then transformed to a legal capacity index by multiplying the index value with the log of GDP. The aid dependence is the total net aid flows to the countries in the LDC Union, set in relation to the total GDP of the group. We also adjust for the time the countries have been WTO members. Clearly, this is not the only

way in which we could form a LDC Union. However, they seem to us to represent one natural experiment.

Having constructed the LDC Union along the lines described above, the next step is to use the estimated coefficients from the model to calculate the expected number of disputes it would initiate.[28] The prediction thus derived is that this country would initiate 4.3 disputes rather than the two disputes that the model predicts that this group of countries would have if acting individually. Again, we want to emphasize that one should not put much faith in the absolute level of this number. What it may shed light on however, are some more qualitative features of dispute initiation, which is that LDCs may have so few disputes not only because of small trade volumes, or because of small own GDP, but also because of the *interaction* between such explanatory factors. Loosely put: the fact that simultaneously both LDC export volumes and GDP levels (and other factors affecting the number of ISBDs) are small is what makes things particularly bad from a dispute initiation point of view. Collectively, the factors that define underdevelopment work together to drive down participation in the DS system in a predictable fashion.

6.3.3 What is the impact of the LDC composition of exports on dispute initiation?

A common perception in the policy literature seems to be the notion that part of the reason why developing countries participate less as complainants is that their trade compositions differ from those of richer countries. To shed some light on the validity of this claim, we use the estimated model to undertake the thought experiment of assuming that the industry export shares of the LDC Union formed in the previous subsection, are changed so as to replicate export shares of richer countries while maintaining a constant total volume of exports. The idea is hence to neutralize for absolute trade volume, and to focus on the effect of the industry structure *per se*. More specifically, we first compute the unweighted average of the share of each the industry groups in total exports for across the three groups of richer countries G2, EI and NI.[29] We then ask how many disputes the LDC Union would have if its total export volume were the same as computed before, but with the richer country composition of these exports.

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[28] This procedure could be criticized on the ground that the coefficients would be different if estimated with the LDC Union in place. But we believe that it would not make much difference to the results quantitatively, since the LDC are small also in the aggregate relative to the other countries.

[29] An alternative to using an unweighted scheme would be to simply aggregate over the three groups (this would in turn of course be equivalent to using total exports as weights when computing the average). This would imply that the G2 export structure would dominate the computed shares.

As it turns out, the trade structure of the LDCs seems to have a very limited impact on their dispute initiation. As mentioned above, the LDC Union would be expected to initiate approximately 4.3 disputes with the actual trade structure of these countries. Taking the further step of changing the structure to that of the developed countries would only increase the number of expected disputes to just under five. Hence, it seems as if the composition of LDC exports in itself is not a very important factor explaining the limited participation. Of course, we should be very careful not to draw far-reaching policy conclusions based on this finding. For instance, even if we trusted the number (which we should not do without much further verification), we should not jump to the conclusion that the problem of what appears to be too low levels of dispute initiation is explained partly or fully by other factors than trade structure. It may well be that our very broad industry groups in actuality encompass significant intra-group differences. To address this problem, we would need a much more refined industry classification. But we have deliberately chosen a fairly coarse industry classification, partly for the sake of expositional clarity, and partly in order to aggregate away noise in the data. Also, if we were to find that the composition seems to matter we would have to determine *why* this is the case, in order to draw any policy conclusions. For instance, this might reflect other differences between developed and developing countries that are endogenously captured by the included regressors.

6.4 Other econometric approaches

Our conclusion from the above is that the negative binomial model seems to be doing a fairly good job. Nonetheless, it is likely that it will not be able to fully handle the problems caused by the very large number of zeros. There are techniques however, that are meant to address the problem with a large number of zeros more directly. A prominent candidate here is an extension of the model, the "zero-inflated negative binomial model." Applied to the present context, an essential feature of this approach is to view the determination of the number of dispute initiations as two separate processes. One determines whether a country is active at all as a potential complainant, and the second determines the number of disputes that the country has over a certain period, given that it decides in the first process to potentially participate. A zero-participation for a country can then result either from a decision to not participate at all, or from a decision to potentially participate combined with a decision not to launch any complaints despite the readiness to do so.

This view of dispute initiation seems to us to resonate well with the popular notion that some countries – in particular LDCs – are not even potentially complainants, but are completely outside the system. For instance, it has been forcefully argued by Shaffer (2003) that for the reasons discussed above, as well as some additional factors, the poorest WTO Members are effectively not active players as potential litigants in the DS system. They have nothing to litigate over.

The zero-inflated negative binomial model regression model thus seems to be pertinent for the issue at stake both from a theoretical and from an intuitive point of view. We have spent considerable efforts to estimate such models, using the data presented above. But our attempts have to not been very successful.[30] We therefore leave this area for future research (perhaps in future when we have deeper datasets and better solution methods for these models). However, we want to emphasize that the dominance of zeros in the data is a feature that needs to be addressed in future work in this area.[31]

7. Concluding remarks

There has been an undercurrent of worry around the WTO DS mechanism since its inception. In particular, there has been alleged that the system is biased against developing countries, and there have been proposals for reform of the system to remedy such perceived biases, particularly in dispute initiation. The starting point of research in this area is therefore a seemingly simple question. "Do developing countries use the DS mechanism less than they 'should' based on objective criteria?"

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[30] At some instance, the maximum likelihood estimations that are used do not converge. At other instances, the models produce absurd predictions. We believe that these features may stem from the fact that the zero-inflated negative binomial model combines two more primitive models, a count data model, and a probability model. Count data models and binary response models (BRM) have different underlying assumptions. When combined, as in the zero-inflated negative binomial model, their interaction may have effects on robustness that do not seem to have been sufficiently explored in the literature. In particular BRMs makes strong assumptions concerning correct specification and marginal effects of the regressors. In cases when endogeneity is present, the maximum likelihood estimator performs notoriously bad. (See Hall and Shen (2005).)

[31] It should be said that binary response models (probit and logit) to a certain degree solve this problem by only reflecting whether or not a dispute has occurred. This is done at the cost of disregarding a significant amount of information, however, and the results can therefore be quite misleading.

In our empirical analysis, we have tried to highlight aspects of this question, by improving on the earlier literature in several respects. First, we use a much richer dispute data set than has been used so far in the literature, by including all dispute initiation during the period 1995-2006. Second, we focus more on the role of industrial structure than has been done in the literature. Third, we employ econometric techniques that, while not entirely new in the field, are more suitable to the situation at hand than what is often used. Our results suggest that the composition of trade, the volume of trade, income levels, aid levels, and legal capacity, explain the observed aggregate level of dispute initiation fairly well. Predictions from the estimated model also suggest that Low Income Developing countries, as defined in Table 1, have launched more complaints than they should have, based on these characteristics.

Fourth, we use the estimated model to answer two fundamental questions concerning the determinants of Least Developed Country participation as complainants, questions that to the best of our knowledge have not been highlighted in the literature. Our first question concerns the role of economic country size. It is often said that since LDCs typically are very small in terms of GDP, in terms of trade, etc, that they do not have incentives to launch disputes. We therefore make the thought-experiment of merging all LDCs into an "LDC Union" for the handling of complaints in the DS system. This Union is instructed to base its decisions concerning litigation on the combined exports of its members, and would draw on the combined resources of the countries in other respects. The model predicts that a country with the characteristics of this "LDC Union" would have initiated 4.3 disputes rather than the two disputes that the model predicts that this group of countries would have launched if acting individually. One should be careful not to over-emphasize the validity of these numbers. More interesting is that this experiment suggests that LDCs may have so few disputes not only because of small trade volumes, or because of small GDP levels, but also because of the *interaction* between such explanatory factors.

The second issue upon which we seek to shed light is the common perception in the policy literature that the LDC trade *composition* explains their seemingly low participation rates. To this end we make the further thought experiment of letting the export structure of this "LDC Union" be the same as the average of the exports of G2, Earlier Industrialized and Newly Industrialized countries, while keeping the total volume of exports unchanged. This "LDC Union" is hence in terms of industry export structure a replica of the richer countries,

but is in other respects an aggregation of LDCs. Using the estimated model, this change in export composition would increase the number of disputes by roughly 15%. This suggests that export composition has a fairly limited impact on the dispute initiation by LDC, contrary to what is often suggested.

We would finally like to emphasize the great caution that is needed when drawing policy conclusions based on observations concerning dispute initiation in the DS system. Such conclusions are inevitably based on a number of special assumptions that are typically not made explicit. For instance, there are conceptual problems with regard to the definition of the unit of account ("a dispute") as well as relevant benchmarks, there are econometric problems with regard to how to distinguish the determinants of dispute initiation as well as how to handle the dominance of zeros in the data, there are data availability problems with regard to a number of important variables such as legal capacity and power. In addition, there are conceptual problems with regard to how to frame relevant and well-defined questions that can be answered within the model. We have here tried to address some of these problems, but most still remain.

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Table A-1: Total exports in $US mill and the fraction thereof for each industry group

(see note below)

Complainant	Total	tr_Agr	tr_Ch1	tr_Ch2	tr_Man	tr_Mch	tr_Met	tr_Mt1	tr_Mt2	tr_Oth	tr_Pha	tr_Pla	tr_Stl	tr_Txl	tr_Vhl	tr_Woo
Albania	311	0.10	0.00	0.00	0.02	0.07	0.05	0.03	0.31	0.01	0.00	0.01	0.05	0.31	0.01	0.04
Angola	6020	0.01	0.00	0.00	0.00	0.00	0.00	0.90	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00
Ant.and Barb.	147	0.08	0.00	0.01	0.00	0.02	0.00	0.11	0.00	0.00	0.00	0.02	0.01	0.01	0.73	0.00
Argentina	25400	0.48	0.02	0.02	0.01	0.04	0.02	0.18	0.03	0.00	0.02	0.03	0.04	0.02	0.08	0.02
Armenia	170	0.03	0.00	0.00	0.01	0.02	0.07	0.11	0.00	0.60	0.00	0.00	0.04	0.08	0.01	0.01
Australia	57600	0.22	0.05	0.02	0.02	0.06	0.08	0.32	0.01	0.05	0.02	0.01	0.02	0.06	0.04	0.02
Bahrain	2530	0.02	0.05	0.00	0.01	0.03	0.27	0.46	0.00	0.03	0.00	0.01	0.01	0.09	0.01	0.01
Bangladesh	5890	0.07	0.01	0.00	0.01	0.01	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.86	0.00	0.00
Barbados	296	0.24	0.02	0.05	0.05	0.13	0.04	0.29	0.00	0.01	0.02	0.01	0.01	0.02	0.08	0.04
Belize	293	0.79	0.01	0.00	0.00	0.03	0.00	0.01	0.00	0.00	0.02	0.01	0.02	0.07	0.02	0.02
Benin	286	0.21	0.01	0.01	0.00	0.00	0.00	0.04	0.04	0.01	0.00	0.00	0.00	0.64	0.00	0.02
Bolivia	1020	0.38	0.01	0.00	0.01	0.01	0.06	0.33	0.02	0.08	0.00	0.00	0.00	0.05	0.00	0.05
Botswana	1270	0.04	0.00	0.00	0.00	0.02	0.07	0.01	0.00	0.82	0.00	0.00	0.00	0.02	0.00	0.00
Brazil	54600	0.27	0.03	0.02	0.02	0.12	0.04	0.12	0.05	0.01	0.01	0.03	0.07	0.02	0.12	0.08
Brunei Daruss.	3080	0.00	0.00	0.00	0.01	0.00	0.00	0.86	0.00	0.03	0.00	0.00	0.00	0.09	0.01	0.00
Bulgaria	4380	0.12	0.07	0.01	0.03	0.09	0.11	0.11	0.04	0.01	0.01	0.03	0.10	0.24	0.01	0.03
Burkina Faso	223	0.24	0.00	0.01	0.01	0.04	0.00	0.01	0.05	0.03	0.01	0.02	0.01	0.51	0.05	0.01
Burundi	56	0.78	0.01	0.00	0.00	0.02	0.00	0.07	0.01	0.06	0.00	0.00	0.01	0.01	0.01	0.01
Cambodia	1410	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.01	0.00	0.02	0.00	0.84	0.00	0.04
Cameroon	2020	0.22	0.00	0.00	0.00	0.00	0.05	0.38	0.00	0.00	0.00	0.02	0.00	0.05	0.00	0.27
Canada	240000	0.08	0.02	0.01	0.04	0.16	0.04	0.14	0.00	0.02	0.01	0.04	0.03	0.02	0.26	0.13
Central Afr. Rep	202	0.05	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.68	0.00	0.00	0.00	0.07	0.00	0.16
Chad	102	0.16	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.79	0.02	0.00
Chile	17100	0.33	0.05	0.00	0.01	0.01	0.25	0.15	0.00	0.02	0.01	0.01	0.01	0.01	0.01	0.13
China	368000	0.04	0.02	0.01	0.17	0.32	0.03	0.04	0.10	0.01	0.00	0.03	0.02	0.17	0.01	0.02
Colombia	12900	0.29	0.01	0.04	0.01	0.02	0.01	0.40	0.01	0.03	0.02	0.03	0.02	0.06	0.02	0.02
Congo	1760	0.02	0.00	0.00	0.00	0.00	0.02	0.83	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.07
Costa Rica	6750	0.39	0.00	0.02	0.04	0.32	0.01	0.01	0.01	0.01	0.01	0.03	0.01	0.13	0.00	0.01
Croatia	3040	0.08	0.06	0.01	0.06	0.12	0.03	0.12	0.07	0.01	0.02	0.06	0.04	0.19	0.03	0.10
Cuba	978	0.55	0.03	0.00	0.00	0.01	0.07	0.24	0.00	0.01	0.02	0.00	0.05	0.00	0.00	0.00
Cyprus	870	0.20	0.02	0.01	0.05	0.12	0.03	0.06	0.02	0.02	0.05	0.01	0.02	0.09	0.29	0.01
Czech Republic	28500	0.04	0.03	0.02	0.07	0.29	0.03	0.07	0.01	0.01	0.01	0.06	0.09	0.06	0.17	0.05
Côte d'Ivoire	4220	0.62	0.01	0.01	0.00	0.00	0.00	0.16	0.00	0.02	0.00	0.03	0.01	0.04	0.00	0.09
DR Congo	1180	0.04	0.00	0.00	0.00	0.00	0.08	0.23	0.00	0.61	0.00	0.00	0.00	0.00	0.00	0.03
Djibouti	18	0.30	0.01	0.02	0.02	0.07	0.03	0.06	0.12	0.11	0.10	0.01	0.04	0.01	0.08	0.01
Dominica	89	0.31	0.05	0.23	0.03	0.11	0.01	0.05	0.01	0.01	0.09	0.02	0.04	0.02	0.02	0.01
Dominican Rep.	4870	0.14	0.01	0.00	0.09	0.08	0.01	0.00	0.06	0.04	0.00	0.01	0.04	0.51	0.00	0.00
EC	753000	0.06	0.06	0.03	0.06	0.31	0.03	0.05	0.02	0.04	0.05	0.04	0.04	0.05	0.13	0.03
Ecuador	5680	0.56	0.00	0.00	0.01	0.01	0.00	0.34	0.00	0.00	0.01	0.01	0.01	0.02	0.01	0.02
Egypt	5310	0.12	0.04	0.00	0.02	0.03	0.04	0.41	0.01	0.01	0.01	0.02	0.04	0.26	0.00	0.00
El Salvador	2860	0.19	0.00	0.03	0.01	0.04	0.02	0.02	0.01	0.00	0.02	0.02	0.02	0.58	0.01	0.03
Estonia	3590	0.06	0.02	0.01	0.08	0.22	0.02	0.22	0.02	0.02	0.01	0.01	0.05	0.10	0.03	0.14
FYROM-Mac.	962	0.14	0.01	0.00	0.01	0.05	0.08	0.03	0.06	0.01	0.01	0.00	0.20	0.36	0.04	0.01
Fiji	532	0.44	0.00	0.00	0.01	0.01	0.00	0.00	0.03	0.07	0.00	0.00	0.00	0.39	0.00	0.05
Gabon	2920	0.01	0.00	0.00	0.00	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.18

Complainant	Total	tr_Agr	tr_Ch1	tr_Ch2	tr_Man	tr_Mch	tr_Met	tr_Mt1	tr_Mt2	tr_Oth	tr_Pha	tr_Pla	tr_Stl	tr_Txl	tr_Vhl	tr_Woo
Gambia	83	0.33	0.00	0.00	0.00	0.07	0.00	0.01	0.00	0.51	0.00	0.00	0.00	0.02	0.01	0.03
Georgia	397	0.09	0.04	0.00	0.01	0.05	0.06	0.46	0.00	0.02	0.01	0.01	0.17	0.01	0.01	0.05
Ghana	1500	0.50	0.00	0.00	0.01	0.01	0.12	0.09	0.00	0.07	0.00	0.00	0.00	0.01	0.04	0.14
Grenada	55	0.50	0.01	0.01	0.02	0.23	0.01	0.07	0.00	0.00	0.02	0.01	0.02	0.02	0.06	0.04
Guatemala	4600	0.42	0.01	0.04	0.01	0.01	0.00	0.05	0.01	0.01	0.03	0.03	0.03	0.34	0.00	0.02
Guinea	777	0.09	0.07	0.00	0.00	0.00	0.00	0.60	0.00	0.20	0.00	0.00	0.00	0.01	0.00	0.01
Guinea-Bissau	97	0.45	0.00	0.00	0.00	0.01	0.00	0.47	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02
Guyana	579	0.47	0.00	0.01	0.01	0.00	0.00	0.14	0.00	0.26	0.00	0.00	0.00	0.02	0.01	0.08
Haiti	322	0.12	0.00	0.00	0.01	0.01	0.01	0.00	0.02	0.00	0.02	0.00	0.01	0.79	0.00	0.00
Honduras	3970	0.27	0.00	0.01	0.02	0.02	0.00	0.01	0.00	0.01	0.00	0.01	0.01	0.61	0.01	0.02
HK-China	51100	0.01	0.00	0.01	0.11	0.37	0.02	0.01	0.03	0.09	0.00	0.03	0.01	0.28	0.01	0.01
Hungary	27300	0.08	0.04	0.01	0.04	0.49	0.03	0.03	0.02	0.00	0.01	0.04	0.03	0.05	0.10	0.02
Iceland	2170	0.68	0.00	0.00	0.02	0.04	0.16	0.01	0.01	0.00	0.01	0.00	0.03	0.01	0.01	0.00
India	43200	0.15	0.06	0.02	0.02	0.07	0.02	0.07	0.05	0.18	0.02	0.02	0.05	0.25	0.02	0.01
Indonesia	56400	0.11	0.02	0.01	0.05	0.14	0.02	0.27	0.04	0.01	0.00	0.04	0.01	0.13	0.01	0.12
Israel	26300	0.05	0.07	0.01	0.08	0.26	0.03	0.02	0.00	0.33	0.03	0.04	0.00	0.05	0.02	0.00
Jamaica	1580	0.23	0.40	0.00	0.00	0.01	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00
Japan	413000	0.01	0.03	0.03	0.09	0.48	0.02	0.01	0.00	0.01	0.01	0.04	0.04	0.02	0.22	0.01
Jordan	1180	0.13	0.31	0.01	0.02	0.04	0.02	0.18	0.01	0.03	0.06	0.02	0.01	0.14	0.02	0.02
Kenya	1770	0.60	0.02	0.01	0.01	0.03	0.01	0.15	0.02	0.01	0.01	0.01	0.02	0.06	0.01	0.02
Korea	139000	0.02	0.03	0.01	0.03	0.46	0.02	0.05	0.02	0.01	0.00	0.06	0.06	0.10	0.11	0.01
Kuwait	13700	0.00	0.02	0.00	0.00	0.01	0.00	0.94	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00
Kyrgyz Rep	197	0.03	0.02	0.00	0.00	0.02	0.15	0.01	0.04	0.54	0.00	0.00	0.05	0.12	0.00	0.00
Latvia	2730	0.04	0.03	0.01	0.04	0.03	0.02	0.31	0.01	0.01	0.01	0.01	0.06	0.12	0.01	0.28
Lesotho	265	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.04	0.00	0.00	0.00	0.93	0.00	0.00
Lithuania	3200	0.10	0.07	0.01	0.06	0.10	0.01	0.19	0.02	0.03	0.01	0.01	0.05	0.24	0.02	0.08
Macao - China	2350	0.01	0.01	0.00	0.02	0.04	0.00	0.01	0.06	0.00	0.00	0.00	0.00	0.83	0.00	0.00
Madagascar	869	0.50	0.00	0.00	0.01	0.01	0.00	0.03	0.01	0.01	0.01	0.00	0.00	0.40	0.00	0.02
Malawi	456	0.89	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.08	0.01	0.00
Malaysia	96900	0.06	0.01	0.01	0.04	0.64	0.01	0.08	0.00	0.01	0.00	0.04	0.01	0.03	0.01	0.04
Maldives	170	0.30	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.66	0.00	0.00	
Mali	238	0.06	0.00	0.00	0.01	0.10	0.00	0.00	0.02	0.03	0.00	0.01	0.00	0.74	0.01	0.01
Malta	2170	0.02	0.00	0.00	0.06	0.61	0.00	0.05	0.02	0.03	0.00	0.04	0.01	0.09	0.07	0.00
Mauritania	578	0.53	0.00	0.00	0.00	0.01	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Mauritius	1660	0.27	0.01	0.00	0.03	0.01	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.59	0.01	0.00
Mexico	141000	0.06	0.01	0.01	0.07	0.40	0.02	0.10	0.01	0.01	0.01	0.02	0.02	0.07	0.19	0.01
Moldova	385	0.24	0.00	0.00	0.02	0.02	0.03	0.02	0.07	0.00	0.01	0.00	0.26	0.31	0.01	0.00
Mongolia	398	0.02	0.00	0.00	0.00	0.00	0.01	0.42	0.04	0.03	0.00	0.00	0.01	0.45	0.00	0.02
Morocco	7950	0.22	0.11	0.00	0.01	0.12	0.01	0.11	0.03	0.01	0.00	0.00	0.01	0.34	0.01	0.01
Mozambique	586	0.33	0.00	0.00	0.00	0.02	0.37	0.17	0.00	0.00	0.00	0.00	0.01	0.05	0.01	0.04
Myanmar	2000	0.25	0.00	0.00	0.01	0.01	0.02	0.17	0.01	0.02	0.00	0.01	0.00	0.31	0.00	0.19
Namibia	770	0.48	0.08	0.00	0.00	0.01	0.04	0.07	0.02	0.28	0.00	0.00	0.00	0.00	0.01	0.00
Nepal	632	0.16	0.00	0.02	0.01	0.01	0.03	0.00	0.02	0.02	0.07	0.02	0.02	0.59	0.00	0.02
New Zealand	13600	0.50	0.02	0.05	0.02	0.07	0.05	0.03	0.03	0.01	0.01	0.02	0.02	0.05	0.01	0.13
Nicaragua	976	0.52	0.01	0.00	0.00	0.01	0.00	0.02	0.01	0.03	0.00	0.00	0.01	0.36	0.00	0.02
Niger	267	0.05	0.37	0.00	0.01	0.02	0.00	0.48	0.00	0.00	0.01	0.01	0.01	0.03	0.01	0.00
Nigeria	17100	0.02	0.00	0.00	0.00	0.00	0.00	0.95	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Norway	47300	0.08	0.03	0.01	0.03	0.08	0.06	0.57	0.00	0.01	0.00	0.02	0.03	0.00	0.03	0.04

Complainant	Total	tr_Agr	tr_Ch1	tr_Ch2	tr_Man	tr_Mch	tr_Met	tr_Mt1	tr_Mt2	tr_Oth	tr_Pha	tr_Pla	tr_Stl	tr_Txl	tr_Vhl	tr_Woo
Oman	7760	0.02	0.00	0.00	0.01	0.01	0.00	0.91	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.00
Pakistan	8520	0.12	0.00	0.00	0.04	0.01	0.01	0.02	0.08	0.01	0.00	0.01	0.00	0.69	0.00	0.00
Panama	2620	0.26	0.01	0.01	0.03	0.13	0.02	0.08	0.04	0.02	0.08	0.01	0.01	0.10	0.19	0.02
Papua N Guinea	1840	0.26	0.00	0.00	0.00	0.00	0.01	0.44	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.13
Paraguay	1170	0.59	0.00	0.00	0.00	0.01	0.00	0.17	0.04	0.00	0.01	0.01	0.01	0.09	0.00	0.07
Peru	5880	0.30	0.01	0.01	0.01	0.01	0.19	0.22	0.00	0.09	0.00	0.01	0.01	0.11	0.00	0.02
Philippines	37100	0.07	0.00	0.00	0.04	0.72	0.01	0.02	0.01	0.01	0.00	0.01	0.00	0.08	0.01	0.01
Poland	28500	0.08	0.03	0.01	0.10	0.21	0.05	0.09	0.01	0.01	0.01	0.04	0.08	0.10	0.11	0.07
Qatar	9060	0.00	0.04	0.00	0.00	0.00	0.00	0.89	0.00	0.00	0.00	0.02	0.02	0.01	0.00	0.00
Romania	10600	0.04	0.03	0.00	0.06	0.13	0.04	0.06	0.10	0.00	0.00	0.02	0.10	0.31	0.04	0.05
Rwanda	85	0.38	0.01	0.00	0.00	0.01	0.01	0.46	0.01	0.09	0.00	0.00	0.01	0.01	0.00	0.00
St Kitts and Nevis	64	0.20	0.00	0.00	0.02	0.60	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.04	0.11	0.00
St Lucia	90	0.62	0.00	0.01	0.01	0.13	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.11	0.05	0.04
St Vinc. & Gren.	193	0.37	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.03	0.00	0.00	0.01	0.00	0.55	0.01
Saudi Arabia	60000	0.01	0.05	0.00	0.00	0.01	0.00	0.87	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00
Senegal	700	0.54	0.16	0.02	0.01	0.02	0.01	0.14	0.02	0.00	0.01	0.01	0.02	0.02	0.00	0.01
Sierra Leone	143	0.11	0.01	0.01	0.14	0.09	0.01	0.02	0.02	0.28	0.00	0.01	0.00	0.02	0.26	0.02
Singapore	80800	0.02	0.05	0.02	0.03	0.66	0.01	0.10	0.00	0.02	0.01	0.03	0.01	0.01	0.02	0.01
Slovak Republic	11500	0.03	0.03	0.01	0.04	0.19	0.03	0.09	0.03	0.01	0.01	0.05	0.12	0.07	0.22	0.06
Slovenia	8230	0.03	0.02	0.02	0.13	0.22	0.07	0.03	0.03	0.01	0.04	0.05	0.06	0.09	0.15	0.07
Solomon Islands	134	0.52	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45
South Africa	36200	0.11	0.03	0.02	0.02	0.09	0.04	0.16	0.01	0.26	0.01	0.02	0.08	0.03	0.08	0.04
Sri Lanka	4510	0.15	0.00	0.01	0.03	0.04	0.00	0.02	0.04	0.05	0.00	0.06	0.00	0.58	0.01	0.01
Suriname	543	0.19	0.60	0.00	0.00	0.01	0.02	0.07	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.01
Swaziland	391	0.44	0.01	0.01	0.03	0.09	0.01	0.01	0.00	0.02	0.09	0.01	0.01	0.19	0.01	0.08
Switzerland	88800	0.03	0.08	0.04	0.15	0.26	0.03	0.02	0.00	0.18	0.10	0.03	0.02	0.02	0.02	0.02
Tanzania	653	0.65	0.00	0.00	0.00	0.02	0.02	0.08	0.01	0.09	0.00	0.00	0.01	0.10	0.01	0.01
Thailand	63000	0.16	0.01	0.01	0.06	0.41	0.01	0.04	0.03	0.03	0.00	0.08	0.02	0.08	0.03	0.02
Togo	302	0.21	0.03	0.03	0.00	0.02	0.01	0.41	0.01	0.02	0.00	0.00	0.01	0.20	0.02	0.02
Trinidad and Tob.	3690	0.08	0.22	0.01	0.01	0.01	0.00	0.55	0.00	0.00	0.00	0.01	0.07	0.01	0.01	0.02
Tunisia	6100	0.07	0.09	0.00	0.02	0.13	0.00	0.09	0.06	0.00	0.00	0.01	0.01	0.50	0.01	0.01
Turkey	26200	0.13	0.01	0.01	0.02	0.13	0.02	0.07	0.02	0.02	0.00	0.03	0.08	0.40	0.07	0.01
US	707000	0.08	0.04	0.03	0.08	0.39	0.02	0.03	0.01	0.02	0.03	0.05	0.02	0.03	0.14	0.03
Uganda	396	0.87	0.00	0.00	0.00	0.01	0.01	0.01	0.03	0.01	0.00	0.00	0.01	0.03	0.01	0.00
United Arab Em.	28100	0.04	0.01	0.01	0.01	0.04	0.03	0.74	0.00	0.05	0.01	0.01	0.01	0.03	0.01	0.00
Uruguay	2520	0.48	0.02	0.02	0.01	0.02	0.01	0.02	0.10	0.02	0.04	0.05	0.01	0.11	0.05	0.05
Venezuela	24500	0.02	0.03	0.00	0.00	0.01	0.04	0.82	0.00	0.00	0.00	0.01	0.04	0.00	0.01	0.00
Zambia	685	0.13	0.00	0.01	0.00	0.02	0.65	0.06	0.00	0.03	0.00	0.00	0.01	0.09	0.01	0.00
Zimbabwe	1770	0.51	0.01	0.01	0.01	0.02	0.07	0.08	0.02	0.04	0.00	0.01	0.10	0.10	0.01	0.02

Note: Total trade includes all trade for which an HS 2-digit number has been reported. It is computed as an average over 1998-2002, as described in the main text. The remaining columns, which horizontally sum to unity, give the distribution of this trade across industry groups.

Table A-2: Legal capacity and aid dependence (see note below)

Country	Own legal capacity	Average partner legal capacity	Average aid dependence
Albania	27.75	96.80	2.38
Angola	5.15	93.60	0.45
Antigua. & Bar.	48.11	88.45	0.18
Argentina	51.96	70.52	0.00
Armenia	27.70	89.56	1.22
Australia	100.38	79.56	0.00
Bahrain	55.09	71.79	0.00
Bangladesh	33.17	99.46	0.14
Barbados	68.88	65.10	0.03
Belize	31.77	89.94	0.26
Benin	34.65	51.17	0.31
Bolivia	35.68	64.92	0.31
Botswana	59.35	96.10	0.17
Brazil	47.84	83.33	0.00
Brunei Daruss.	53.24	84.38	0.00
Bulgaria	34.60	85.87	0.00
Burkina Faso	31.19	60.24	0.73
Burundi	12.11	89.37	2.58
Cambodia	24.20	101.27	0.74
Cameroon	28.79	92.39	0.33
Canada	106.58	102.50	0.00
Central Afr Rep	13.58	94.89	2.50
Chad	27.53	83.92	1.53
Chile	79.36	81.73	0.00
China	56.25	90.98	0.01
Colombia	41.62	85.11	0.10
Congo	11.30	80.74	0.05
Costa Rica	56.64	91.92	-0.09
Croatia	49.77	88.20	0.07
Cuba	35.78	83.71	0.02
Cyprus	70.46	85.67	0.27
Czech Republic	64.68	89.98	0.46
Côte d'Ivoire	28.30	79.38	0.19
Dem. Rep. Congo	0.00	95.92	0.80
Djibouti	17.96	74.16	0.38
Dominica	26.86	72.15	0.94
Dominican Rep.	33.41	105.12	0.05
EC	99.35	81.34	0.00
Ecuador	22.15	84.43	0.11
Egypt	46.04	87.40	0.19
El Salvador	38.95	86.44	0.24
Estonia	59.39	94.13	0.68
FYROM-Mac.	31.06	90.74	1.65
Fiji	36.87	98.96	0.31
Gabon	27.09	95.20	0.08

Country	Own legal capacity	Average partner legal capacity	Average aid dependence
Gambia	28.81	86.44	1.27
Georgia	26.52	74.06	0.49
Ghana	39.06	90.11	0.60
Grenada	37.46	78.23	0.09
Guatemala	33.87	86.47	0.18
Guinea	29.46	90.53	0.90
Guinea-Bissau	15.98	56.33	0.98
Guyana	34.19	93.59	0.97
Haiti	9.23	105.95	2.04
Honduras	30.77	99.50	1.44
Hong Kong - China	83.42	83.97	0.00
Hungary	65.67	93.47	0.39
Iceland	88.81	97.19	0.00
India	47.30	84.30	0.01
Indonesia	35.30	84.60	0.15
Israel	74.96	94.99	0.31
Jamaica	36.00	97.42	0.04
Japan	86.86	87.23	0.00
Jordan	51.73	67.31	0.41
Kenya	24.80	74.64	0.19
Korea	69.46	83.50	0.00
Kuwait	47.88	83.61	0.00
Kyrgyz Republic	27.07	82.12	0.83
Latvia	52.16	89.72	0.52
Lesotho	33.06	105.21	0.33
Lithuania	53.54	89.18	0.46
Macao - China	60.95	99.70	0.00
Madagascar	30.59	96.16	1.16
Malawi	27.00	84.21	2.42
Malaysia	67.33	91.04	0.01
Maldives	46.71	88.40	0.08
Mali	28.72	71.06	0.54
Malta	59.49	94.11	0.05
Mauritania	34.72	80.43	6.78
Mauritius	54.22	96.02	0.27
Mexico	56.89	103.50	0.00
Moldova	23.04	86.33	0.93
Mongolia	35.62	76.85	0.95
Morocco	45.99	92.46	0.47
Mozambique	31.03	78.52	1.77
Myanmar	9.15	75.95	0.02
Namibia	44.15	94.57	1.13
Nepal	26.07	80.13	0.20
New Zealand	91.65	87.23	0.00
Nicaragua	26.34	91.35	1.29
Niger	18.89	80.04	0.90
Nigeria	17.68	87.87	0.03
Norway	97.17	97.09	0.00

Country	Own legal capacity	Average partner legal capacity	Average aid dependence
Oman	64.30	71.51	0.01
Pakistan	31.41	86.55	0.10
Panama	42.07	62.59	0.00
Papua New Guinea	26.43	89.09	2.95
Paraguay	15.98	62.87	0.04
Peru	41.36	85.05	0.12
Philippines	48.46	92.25	0.10
Poland	65.70	92.64	0.32
Qatar	60.29	82.17	0.00
Romania	32.40	89.22	0.66
Rwanda	27.67	75.00	1.27
Saint Kitts and Nevis	33.46	102.09	0.09
St Lucia	37.31	89.47	0.70
St Vincent & the Gren.	33.16	85.46	0.78
Saudi Arabia	43.97	83.75	0.00
Senegal	41.51	73.24	0.81
Sierra Leone	13.54	87.61	2.70
Singapore	108.04	81.20	0.00
Slovak Republic	50.67	87.31	0.53
Slovenia	62.90	88.40	0.27
Solomon Islands	14.42	72.10	1.31
South Africa	57.81	78.14	0.05
Sri Lanka	38.24	96.08	0.05
Suriname	36.32	94.57	0.12
Swaziland	26.25	80.22	0.31
Switzerland	109.74	90.15	0.00
Tanzania	31.37	75.88	0.50
Thailand	51.98	88.92	0.06
Togo	16.34	57.78	0.08
Trinidad and Tobago	54.61	85.02	0.01
Tunisia	63.40	94.88	0.65
Turkey	45.86	91.81	0.05
US	107.45	82.67	0.00
Uganda	35.06	88.81	0.72
United Arab Emirates	61.02	77.03	0.00
Uruguay	57.95	67.72	0.00
Venezuela	23.98	89.27	0.00
Zambia	27.24	69.67	0.74
Zimbabwe	20.89	77.87	0.11

Note: "Own legal capacity" is computed as described in the main text. "Average partner legal capacity" of a country i is each of its trade partners' legal capacity weighted with the partner's share of total exports of country i. "Average aid dependence" is for a country i the weighted average of its net recepits of aid as a fraction of its GDP, where the weights are each donor's share of the total exports from i.

Table A-3 The definition of the 15 industry groups in terms of the Harmonized System nomenclature

Agr:
SECTION I (HS-1 – HS-5): Live animals, animal products
SECTION II (HS-6 – HS-14): Vegetable products
SECTION III (HS-15) Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes
SECTION IV (HS-16 – HS-24): Prepared foodstuffs; beverages, spirits and vinegar; tobacco and manufactured tobacco substitutes

Mat1:
SECTION V (HS 25-27): Mineral products
SECTION XIII (68-70): Articles of stone, plaster, cement, asbestos, mica or similar materials; ceramic products; glass and glassware

Ch1:
HS-28 Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes
HS-29 Organic chemicals
HS-31 Fertilisers

Pha:
HS-30 Pharmaceutical products
HS-33 33 Essential oils and resinoids; perfumery, cosmetic or toilet preparations.

Ch2:
HS-32 Tanning or dyeing extracts; tannins and their derivatives; dyes, pigments and other colouring matter; paints and varnishes; putty and other mastics; inks.
HS-34 Soap, organic surface-active agents, washing preparations, lubricating preparations, artificial waxes, prepared waxes, polishing or scouring preparations, candles and similar articles, modelling pastes, "dental waxes" and dental preparations with a basis of plaster.
HS-35 Albuminoidal substances; modified starches; glues; enzymes.
HS-36 Explosives; pyrotechnic products; matches; pyrophoric alloys; certain combustible preparations.
HS-37 Photographic or cinematographic goods.
HS-38 Miscellaneous chemical products.

Pla:
SECTION VII (HS-39 – HS-40): Plastics and articles thereof; rubber and articles thereof

Mat2:
SECTION VIII (HS-41 – HS-43): Raw hides and skins, leather, furskins and articles thereof; saddlery and harness; travel goods, handbags and similar containers; articles of animal gut (other than silk-worm gut)
SECTION XII (HS-64 – HS-67 except for HS-65): Footwear, headgear, umbrellas, sun umbrellas, walking-sticks, seat-sticks, whips, riding-crops and parts thereof; prepared feathers and articles made therewith; artificial flowers; articles of human hair

Woo:
SECTION IX (HS-44 – HS 46): Wood and articles of wood; wood charcoal; cork and articles of cork; manufactures of straw, of esparto or of other plaiting materials; basketware and wickerwork
HS-47 Pulp of wood or of other fibrous cellulosic material; recovered (waste and scrap) paper or paperboard.
HS-48 Paper and paperboard; articles of paper pulp, of paper or of paperboard.

Txl:
SECTION XI (HS-50 – HS-63, HS-65): Textiles and textile articles
HS-65 Headgear and parts thereof.

Stl:
HS-72 Iron and steel.
HS-73 Articles of iron or steel.

Met:
SECTION XV (HS-74 – HS-83 except for HS-72, HS-73): Base metals and articles of base metal

Mch:
SECTION XVI (HS-84 – HS-85): Machinery and mechanical appliances; electrical equipment; parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles

Vhl:
SECTION XVII (HS-86 – HS-89): Vehicles, aircraft, vessels and associated transport equipment

Man:
SECTION XVIII (HS-90 – HS-92): Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; clocks and watches; musical instruments; parts and accessories thereof;
SECTION XIX (HS-93): Arms and ammunition; parts and accessories thereof;
SECTION XX (HS-94 – HS-96): Miscellaneous manufactured articles

Oth:
HS-49 Printed books, newspapers, pictures and other products of the printing industry; manuscripts, typescripts and plans.
SECTION XIV (HS-71): Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metal and articles thereof; imitation jewellery; coin
SECTION XXI (HS-97): works of art, collectors' pieces and antiques.

Table A-4: The DS disputes that form the basis for the set of industry-specific bilateral disputes

DS no	Official title of dispute
1	Prohibition of imports of polyethylene and polypropylene
2	Standards for reformulated and conventional gasoline
3	Measures concerning the testing and inspection of agricultural products
4	Standards for reformulated and conventional gasoline
5	Measures concerning the shelf-life of products
6	Imposition of import duties on automobiles from Japan under sections 301 and 304 of the trade act of 1974
7	Trade description of scallops
8	Taxes on alcoholic beverages
9	Duties on imports of cereals
10	Taxes on alcoholic beverages
11	Taxes on alcoholic beverages
12	Trade description of scallops
13	Duties on imports of grains
14	Trade description of scallops
15	Measures affecting the purchase of telecommunications equipment
16	Regime for importation, sale and distribution of bananas
17	Duties on imports of rice
18	Measures affecting importation of salmon
19	Import regime for automobiles
20	Measures concerning the bottled water
21	Measures concerning the importation of salomonids
22	Measures affecting desiccated coconut
23	Anti-dumping investigation in respect of imports of certain oil country tubular goods (OCTG)
24	Restrictions on imports of cotton and man-made fibre underwear
25	Implementation of the Uruguay Round commitments concerning rice
26	Measures concerning meat and meat products (hormones)
27	Regime for the importation, sale and distribution of bananas
28	Measures concerning sound recordings
29	Restrictions on imports of textile and clothing products
30	Countervailing duties on imports of desiccated coconut and coconut milk powder from Sri Lanka
31	Certain measures concerning periodicals
32	Measures affecting imports of women's and girls' woolcoats
33	Measures affecting imports of woven wool shirts and blouses
34	Restrictions on imports of textile and clothing products
36	Patent protection for pharmaceutical and agricultural chemical products
40	Laws, regulations and practices in the telecommunications procurement sector
41	Measures concerning inspection of agricultural products
42	Measures concerning sound recordings
44	Measures affecting consumer photographic film and paper
47	Restrictions on imports of textile and clothing products
48	Measures affecting livestock and meat (hormones)
49	Anti-dumping investigation regarding imports of fresh or chilled tomatoes from Mexico
50	Patent protection for pharmaceutical and agricultural chemical products
51	Certain automotive investment measures
52	Certain measures affecting trade and investment in the automotive sector

54	Certain measures affecting the automobile industry
55	Certain measures affecting the automobile industry
56	Measures affecting imports of footwear, textiles, apparel and other items
57	Textile, clothing and footwear import credit scheme
58	Import prohibition of certain shrimp and shrimp products
59	Certain measures affecting the automobile industry
60	Anti-dumping investigation regarding portland cement from Mexico
61	Import prohibition of certain shrimp and shrimp products
62	Customs classification of certain computer equipment
63	Anti-dumping measures on imports of solid urea from the former German Democratic Republic
64	Certain measures affecting the automobile industry
65	Certain measures affecting trade and investment in the automotive sector
66	Measures affecting imports of pork
67	Customs classification of certain computer equipment
68	Customs classification of certain computer equipment
69	Measures affecting importation of certain poultry products
72	Measures affecting butter products
73	Procurement of a navigation satellite
74	Measures affecting pork and poultry
75	Taxes on alcoholic beverages
76	Measures affecting agricultural products
77	Measures affecting textiles, clothing and footwear
78	Safeguard measure against imports of broom and corn brooms
79	Patent protection for pharmaceutical and agricultural chemical products
81	Certain measures affecting trade and investment in the automotive sector
84	Taxes on alcoholic beverages
85	Measures affecting textiles and apparel products
87	Taxes on alcoholic beverages
89	Imposition of anti-dumping duties on imports of colour television receivers from Korea
97	Countervailing duty investigation of imports of salmon from Chile
98	Definitive safeguard measure on imports of certain dairy products
99	Anti-dumping duty on dynamic random access memory semiconductors (drams) … from Korea
100	Measures affecting imports of poultry products
101	Anti-dumping investigation of high-fructose corn syrup (HFCS) from the United States
102	Measures affecting pork and poultry
105	Regime for the importation, sale and distribution of bananas
106	Subsidies provided to producers and exporters of automotive leather
107	Export measures affecting hides and skins
109	Taxes on alcoholic beverages
110	Taxes on alcoholic beverages
111	Tariff rate quota for imports of groundnuts
112	Countervailing duty investigation against imports of buses from Brazil
114	Patent protection of pharmaceutical products
119	Anti-dumping measures on imports of coated woodfree paper sheets
121	Safeguard measures on imports of footwear
122	Anti-dumping duties on angles, shapes and sections of iron or non-alloysteel and H-beams from Poland
123	Safeguard measures on imports of footwear
126	Subsidies provided to producers and exporters of automotive leather
132	Anti-dumping investigation of high-fructose corn syrup (HFCS) from the United States

133	Measures concerning the importation of dairy products and the transit of cattle
134	Restrictions on certain import duties on rice
135	Measures affecting asbestos and products containing asbestos
137	Measures affecting imports of wood of conifers from Canada
138	Imposition of CVDs on certain hot-rolled lead and bismuth carbon steel products originating in the UK
139	Certain automotive industry measures
140	Anti-dumping investigations regarding unbleached cotton fabrics from India
141	Anti-dumping duties on imports of cotton-type bed-linen from India
142	Certain measures affecting the automotive industry
143	Measure affecting import duty on wheat from Hungary
144	Certain measures affecting the import of cattle, swine and grain from Canada
145	Countervailing duties on imports of wheat gluten from the EC
146	Measures affecting the automotive sector
147	Tariff quotas and subsidies affecting leather
148	Measure affecting import duty on wheat from Hungary
151	Measures affecting textiles and apparel products (II)
153	Patent protection on pharmaceutical and agricultural chemical products
154	Measures affecting differential and favourable treatment of coffee
156	Definitive anti-dumping measure on grey portland cement from Mexico
157	Definitive anti-dumping measures on imports of drill bits from Italy
158	Regime for the importation, sale and distribution of bananas
159	Safeguard measure on imports of steel products from the Czech Republic
161	Measures affecting imports of fresh, chilled and frozen beef
164	Measures affecting imports of footwear
165	Import measures on certain products from the EC
166	Definitive safeguard measures on imports of wheat gluten from the EC
167	Countervailing duty investigation with respect to live cattle from Canada
168	Anti-dumping duties on certain pharmaceutical products from India
169	Measures affecting imports of fresh, chilled and frozen beef
171	Patent protection for pharmaceuticals and test data protection for agricultural chemicals
172	Measures relating to the development of a flight management system
173	Measures relating to the development of a flight management system
175	Measures affecting trade and investment in the motor vehicle sector
177	Safeguard measure on imports of fresh, chilled and frozen lamb from New Zealand
178	Safeguard measure on imports of lamb meat from Australia
179	Anti-dumping measures on stainless steel plate in coils and stainless steel sheet and strip from Korea
180	Reclassification on certain sugar syrups
181	Safeguard measure on imports of plain polyester filaments from Thailand
182	Ecuador - Provisional anti-dumping measure on cement from Mexico
184	Anti-dumping measures on certain hot-rolled steel products from Japan
185	Certain measures affecting imports of pasta from Costa Rica
187	Provisional anti-dumping measure on imports of macaroni and spaghetti from Costa Rica
189	Definitive anti-dumping measures on carton-board imports from Germany …. ceramic floor tiles from Italy
190	Transitional safeguard measures on certain imports of woven fabrics of cotton … originating in Brazil
191	Definitive anti-dumping measure on cement from Mexico
192	Transitional safeguard measure on combed cotton yarn from Pakistan
193	Measures affecting the transit and importation of swordfish
195	Measures affecting trade and investment in the motor vehicle sector
202	Definitive safeguard measures on imports of circular welded carbon quality line pipe from Korea
203	Measures affecting trade in live swine

205	Import Prohibition on canned tuna with soybean oil
206	Anti-dumping and countervailing measures on steel plate from India
207	Price band system and safeguard measures relating to certain agricultural products
208	Anti-dumping duty on steel and iron pipe fittings
209	Measures affecting soluble coffee
210	Administration of measures establishing customs duties for rice
211	Definitive anti-dumping measures on steel rebar from Turkey
212	Countervailing measures concerning certain products from the EC
213	Countervailing duties on certain corrosion-resistant carbon steel flat products from Germany
214	Definitive safeguard measures on imports of steel wire rod and circular welded carbon quality line pipe
215	Anti-dumping measures regarding polypropylene resins from Korea
216	Provisional anti-dumping measure on electric transformers
218	Countervailing duties on certain carbon steel products from Brazil
219	Anti-dumping duties on malleable cast iron tube or pipe fittings from Brazil
220	Price band system and safeguard measures relating to certain agricultural products
223	Tariff-rate quota on corn gluten feed from the US
225	Anti-dumping duties on seamless pipe from Italy
226	Provisional safeguard measure on mixtures of edible oils
227	Taxes on cigarettes
228	Safeguard Measures on Sugar
229	Anti-Dumping Duties on Jute Bags from India
230	Safeguard Measures and Modification of Schedules Regarding Sugar
231	Trade Description of Sardines
232	Measures Affecting the Import of Matches
233	Measures Affecting the Import of Pharmaceutical Products
235	Safeguard Measure on Imports of Sugar
236	Preliminary Determinations with Respect to Certain Softwood Lumber from Canada
237	Certain Import Procedures for Fresh Fruit
238	Definitive Safeguard Measures on Imports of Preserved Peaches
240	Import Prohibition on Wheat and Wheat Flour
241	Definitive Anti-Dumping Duties on Poultry from Brazil
243	Rules of origin for textiles and apparel products
244	Sunset review of anti-dumping duties on corrosion-resistant carbon steel flat products from Japan
245	Measures affecting the importation of apples
247	Provisional anti-dumping measure on imports of certain softwood lumber from Canada
248	Definitive safeguard measures on imports of certain steel products
249	Definitive safeguard measures on imports of certain steel products
250	Equalizing excise tax imposed by Florida on processed orange and grapefruit Products
251	Definitive safeguard measures on imports of certain steel products
252	Definitive safeguard measures on imports of certain steel products
253	Definitive safeguard measures on imports of certain steel products
254	Definitive safeguard measures on imports of certain steel products
255	Tax treatment on certain imported products
256	Import ban on pet food from Hungary
257	Final countervailing duty determination with respect to certain softwood lumber from Canada
258	Definitive safeguard measures on imports of certain steel products
259	Definitive safeguard measures on imports of certain steel products
260	Provisional safeguard measures on imports of certain steel products
262	Sunset reviews of anti-dumping and CVDs on certain steel products from France and Germany
263	Measures affecting imports of wine
264	Final dumping determination on softwood lumber from Canada
267	Subsidies on upland Cotton
268	Sunset reviews of anti-dumping measures on oil country tubular goods from Argentina
269	Customs classification of frozen boneless chicken cuts

Table A-4 cont'd

270	Certain measures affecting the importation of fresh fruit and vegetables
271	Certain measures affecting the importation of fresh pineapple
272	Provisional anti-dumping duties on vegetable oils from Argentina
273	Measures affecting trade in commercial vessels
274	Definitive safeguard measures on imports of certain steel products
275	Import licensing measures on certain agricultural products
277	Investigation of the International Trade Commission in softwood lumber from Canada
278	Definitive safeguard measure on imports of fructose
279	Import restrictions maintained under the export and import policy 2002-2007
280	Countervailing duties on steel plate from Mexico
281	Anti-dumping measures on cement from Mexico
283	Export subsidies on sugar
284	Certain measures preventing the importation of black beans from Nicaragua
286	Customs classification of frozen boneless chicken cuts
287	Quarantine regime for imports
288	Definitive anti-dumping measures on blanketing from Turkey
289	Additional duty on imports of pig-meat from Poland
295	Definitive anti-dumping measures on beef and rice
296	CVD investigation on dynamic random access memory semiconductors (DRAMS) from Korea
297	Measure affecting imports of live animals and meat products
299	Countervailing measures on dynamic random access memory chips from Korea
300	Measures affecting the importation of cigarettes
301	Measures affecting trade in commercial vessels
302	Measures affecting the importation and internal sale of cigarettes
303	Definitive safeguard measure on imports of medium density fibreboard
304	Anti-dumping measures on imports of certain products from the EC and/or member states
305	Measures affecting imports of textile and apparel products
306	Anti-dumping measure on batteries from Bangladesh
307	Aid for commercial vessels
308	Tax measures on soft drinks and other beverages
309	Value-added Tax on Integrated Circuits
310	Determination of the International Trade Commission in Hard Red Spring Wheat from Canada
311	Reviews of countervailing duty on softwood lumber from Canada
312	Anti-dumping duties on imports of certain paper from Indonesia
313	Anti-dumping duties on certain flat rolled iron or non-alloy steel products from India
314	Provisional countervailing measures on olive oil from EC
316	Measures Affecting Trade in Large Civil Aircraft
317	Measures Affecting Trade in Large Civil Aircraft
323	Import quotas on dried laver and seasoned laver
324	Provisional anti-dumping measures on shrimp from Thailand
325	Anti-dumping determinations regarding stainless steel from Mexico
326	Definitive safeguard measure on salmon
327	Anti-dumping duties on matches from Pakistan
328	Definitive Safeguard Measure on Salmon
329	Tariff Classification of Certain Milk Products
330	Countervailing Duties on Olive oil, Wheat Gluten and Peaches
331	Anti-dumping Duties on Steel Pipes and Tubes from Guatemala
332	Measures Affecting Imports of Retreaded Tires
334	Measures Affecting the Importation of Rice
335	Anti-dumping measure on shrimp from Ecuador
336	Countervailing Duties on Dynamic Random Access Memories from Korea

Table A-4 cont'd

337	Anti-Dumping Measure on Farmed Salmon from Norway
338	Provisional Anti-dumping and Countervailing Duties on grain corn from the US
339	Measures affecting imports of automobile parts
340	Measures affecting imports of automobile parts
341	Definitive countervailing measures on olive oil from the EC
342	Measures affecting imports of automobile parts
343	Measures relating to shrimp from Thailand
345	Customs bond directive for merchandise subject to Anti-Dumping/Countervailing Duties
347	Measures Affecting Trade in Large Civil Aircraft (Second Complaint)
348	Customs Measures on Importation of Certain Products from Panama
349	Measures Affecting the Tariff Quota for Fresh or Chilled Garlic
351	Provisional Safeguard Measure on Certain Milk Products

Table A-5: The DS disputes that form the basis for the set of industry-specific bilateral disputes

DS no	Complainants	Respondent	Industry groups
1	Singapore	Malaysia	Pla
2	Venezuela	US	Mt1
3	US	Korea	Agr
4	Brazil	US	Mt1
5	US	Korea	Agr, Ch2, Man, Met, Oth, Pha, Pla
6	Japan	US	Vhl
7	Canada	EC	Agr
8	EC	Japan	Agr
9	Canada	EC	Agr
10	Canada	Japan	Agr
11	US	Japan	Agr
12	Peru	EC	Agr
13	US	EC	Agr
14	Chile	EC	Agr
15	EC	Japan	Agr, Mch
16	Guatemala, Honduras, Mexico, US	EC	Agr
17	Thailand	EC	Agr
18	Canada	Australia	Agr
19	India	Poland	Vhl
20	Canada	Korea	Agr
21	US	Australia	Agr
22	Philippines	Brazil	Agr
23	Mexico	Venezuela	Stl
24	Costa Rica	US	Txl
25	Uruguay	EC	Agr
26	US	EC	Agr
27	Ecuador, Guatemala, Honduras, Mexico, US	EC	Agr
28	US	Japan	Mch
29	Hong Kong – China	Turkey	Txl
30	Sri Lanka	Brazil	Agr
31	US	Canada	Oth
32	India	US	Txl
33	India	US	Txl
34	India	Turkey	Txl
36	US	Pakistan	Ch1, Pha
40	EC	Korea	Mch
41	US	Korea	Agr
42	EC	Japan	Mch
44	US	Japan	Ch2
47	Thailand	Turkey	Txl
48	Canada	EC	Agr
49	Mexico	US	Agr
50	US	India	Ch1, Pha
51	Japan	Brazil	Vhl
52	US	Brazil	Vhl

54	EC	Indonesia	Vhl
55	Japan	Indonesia	Vhl
56	US	Argentina	Mt2, Txl
57	US	Australia	Mt2
58	India, Malaysia, Pakistan, Thailand	US	Agr
59	US	Indonesia	Vhl
60	Mexico	Guatemala	Mt1
61	Philippines	US	Agr
62	US	EC	Mch
63	EC	US	Ch1
64	Japan	Indonesia	Vhl
65	US	Brazil	Vhl
66	EC	Japan	Agr
67	US	United Kingdom	Mch
68	US	Ireland	Mch
69	Brazil	EC	Agr
72	New Zealand	EC	Agr
73	EC	Japan	Vhl
74	US	Philippines	Agr
75	EC	Korea	Agr
76	US	Japan	Agr
77	EC	Argentina	Mt2, Txl
78	Colombia	US	Man
79	EC	India	Ch1, Pha
81	EC	Brazil	Vhl
84	US	Korea	Agr
85	EC	US	Txl
87	EC	Chile	Agr
89	Korea	US	Mch
97	Chile	US	Agr
98	EC	Korea	Agr
99	Korea	US	Mch
100	EC	US	Agr
101	US	Mexico	Agr
102	US	Philippines	Agr
105	Panama	EC	Agr
106	US	Australia	Mt2
107	EC	Pakistan	Mt2
109	US	Chile	Agr
110	EC	Chile	Agr
111	Argentina	US	Agr
112	Brazil	Peru	Vhl
114	EC	Canada	Pha
119	Switzerland	Australia	Woo
121	EC	Argentina	Mt2
122	Poland	Thailand	Stl
123	Indonesia	Argentina	Mt2
126	US	Australia	Mt2
132	US	Mexico	Agr

133	Switzerland	Slovak Republic	Agr
134	India	EC	Agr
135	Canada	EC	Mt1
137	Canada	EC	Woo
138	EC	US	Stl
139	Japan	Canada	Vhl
140	India	EC	Txl
141	India	EC	Txl
142	EC	Canada	Vhl
143	Hungary	Slovak Republic	Agr
144	Canada	US	Agr
145	EC	Argentina	Agr
146	EC	India	Vhl
147	EC	Japan	Mt2
148	Hungary	Czech Republic	Agr
151	EC	US	Txl
153	Canada	EC	Ch1, Pha
154	Brazil	EC	Agr
156	Mexico	Guatemala	Mt1
157	EC	Argentina	Met
158	Honduras, Mexico, Guatemala, Panama, US	EC	Agr
159	Czech Republic	Hungary	Stl
161	US	Korea	Agr
164	US	Argentina	Mt2
165	EC	US	Agr, Ch2, Mch, Mt2, Oth, Pha, Pla, Txl, Woo
166	EC	US	Agr
167	Canada	US	Agr
168	India	South Africa	Ch1, Pha
169	Australia	Korea	Agr
171	US	Argentina	Ch1, Pha
172	US	EC	Vhl
173	US	France	Vhl
175	US	India	Vhl
177	New Zealand	US	Agr
178	Australia	US	Agr
179	Korea	US	Stl
180	Canada	US	Agr
181	Thailand	Colombia	Txl
182	Mexico	Ecuador	Ch1, Mt1
184	Japan	US	Stl
185	Costa Rica	Trinidad and Tobago	Agr
187	Costa Rica	Trinidad and Tobago	Agr
189	EC	Argentina	Mt1, Woo
190	Brazil	Argentina	Txl
191	Mexico	Ecuador	Mt1
192	Pakistan	US	Txl
193	EC	Chile	Agr
195	US	Philippines	Vhl
202	Korea	US	Stl

203 US	Mexico	Agr
205 Thailand	Egypt	Agr
206 India	US	Stl
207 Argentina	Chile	Agr
208 Brazil	Turkey	Stl
209 Brazil	EC	Agr
210 US	EC	Agr
211 Turkey	Egypt	Stl
212 EC	US	Agr, Stl
213 EC	US	Stl
214 EC	US	Stl
215 Korea	Philippines	Pla
216 Brazil	Mexico	Mch
218 Brazil	US	Stl
219 Brazil	EC	Stl
220 Guatemala	Chile	Agr
223 US	EC	Agr
225 EC	US	Stl
226 Argentina	Chile	Agr
227 Chile	Peru	Agr
228 Colombia	Chile	Agr
229 India	Brazil	Txl
230 Colombia	Chile	Agr
231 Peru	EC	Agr
232 Chile	Mexico	Ch2
233 India	Argentina	Pha
235 Poland	Slovak Republic	Agr
236 Canada	US	Woo
237 Ecuador	Turkey	Agr
238 Chile	Argentina	Agr
240 Hungary	Romania	Agr
241 Brazil	Argentina	Agr
243 India	US	Txl
244 Japan	US	Stl
245 US	Japan	Agr
247 Canada	US	Woo
248 EC	US	Mch, Stl
249 Japan	US	Mch, Stl
250 Brazil	US	Agr
251 Korea	US	Mch, Stl
252 China	US	Mch, Stl
253 Switzerland	US	Mch, Stl
254 Norway	US	Mch, Stl
255 Chile	Peru	Agr
256 Hungary	Turkey	Agr
257 Canada	US	Woo
258 New Zealand	US	Mch, Stl
259 Brazil	US	Mch, Stl
260 US	EC	Stl
262 EC	US	Stl
263 Argentina	EC	Agr
264 Canada	US	Woo
267 Brazil	US	Txl
268 Argentina	US	Stl

270	Philippines	Australia	Agr
271	Philippines	Australia	Agr
272	Argentina	Peru	Agr
273	EC	Korea	Vhl
274	Chinese Taipei	US	Mch, Stl
275	US	Venezuela	Agr
277	Canada	US	Woo
278	Argentina	Chile	Agr
279	EC	India	Agr, Ch1, Ch2, Mch, Mt1, Oth, Pha, Stl, Vhl, Woo
280	Mexico	US	Stl
281	Mexico	US	Mt1
283	Thailand	EC	Agr
284	Nicaragua	Mexico	Agr
286	Thailand	EC	Agr
287	EC	Australia	Agr
288	Turkey	South Africa	Txl
289	Poland	Czech Republic	Agr
295	US	Mexico	Agr
296	Korea	US	Mch
297	Hungary	Croatia	Agr
299	Korea	EC	Mch
300	Honduras	Dominican Republic	Agr
301	Korea	EC	Vhl
302	Honduras	Dominican Republic	Agr
303	Chile	Ecuador	Woo
304	EC	India	Ch1, Ch2, Pla, Stl, Txl, Woo
305	US	Egypt	Txl
306	Bangladesh	India	Mch
307	Korea	EC	Vhl
308	US	Mexico	Agr
309	US	China	Mch
310	Canada	US	Agr
311	Canada	US	Woo
312	Indonesia	Korea	Woo
313	India	EC	Stl
314	EC	Mexico	Agr
316	US	EC	Vhl
317	EC	US	Vhl
323	Korea	Japan	Agr
324	Thailand	US	Agr
325	Mexico	US	Stl
326	Chile	EC	Agr
327	Pakistan	Egypt	Ch2
328	Norway	EC	Agr

329 Mexico	Panama	Agr
330 EC	Argentina	Agr
331 Guatemala	Mexico	Stl
332 EC	Brazil	Vhl
334 US	Turkey	Agr
335 Ecuador	US	Agr
336 Korea	Japan	Mch
337 Norway	EC	Agr
338 US	Canada	Agr
339 EC	China	Vhl
340 US	China	Vhl
341 EC	Mexico	Agr
342 Canada	China	Vhl
343 Thailand	US	Agr
345 India	US	Agr
347 US	EC	Vhl
348 Panama	Colombia	Mt2
349 Argentina	EC	Agr
351 Argentina	Chile	Agr

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351   Provisional Safeguard Measure on Certain Milk Products