

**Sticking To The Rules:  
Quantifying the market access that is potentially  
protected by WTO-sanctioned trade retaliation<sup>1</sup>**

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Abstract:

The Uruguay Round agreements involved a substantial expansion in the commitments made by World Trade Organisation (WTO) members. To strengthen the incentives for nations to adhere to these new WTO rules, the multilateral dispute settlement procedures were reformed. A WTO member can now withdraw the concessions it has made to another WTO member that has been found to have broken its multilateral commitments. The threat of bilateral sanctions against a nation's own exports may provide a nation with an incentive not to renege on its obligations at the WTO. I assess the strength of the incentives created by trade sanctions for the twenty largest exporters in the developing world and, for comparative purposes, Japan and the United States. For each of these 22 economies, I calculate the percentage of a nation's market access is effectively protected by the potential for WTO-sanctioned retaliation; taking into account the fact that each nation's trading partners vary considerably in the amount of bilateral trade that they could, in principle, sanction and the fact that the impact of sanctions varies markedly across different types of goods. The findings not only confirm some of the conjectures made in the existing literature, but also point to the importance of some hitherto unremarked upon factors. Most notably, the proportion of market access protected varies considerably across nations, and does not appear to be related to the level of development; which is germane to the discussion of prevailing asymmetries between industrial and developing economies in the WTO's Dispute Settlement Understanding. Another finding is that, as far as the twenty-two large trading nations considered here are concerned, one can identify a clear "WTO enforcement club" of nations whose bilateral trade flows are sufficiently large that they have some clout over several importing nations. Interestingly, it looks like membership of this club does not extend to Africa (even to South Africa), South Asia, the Middle East, and Latin America. A related point is that the data points to a growing potential role for East Asian nations in the WTO dispute settlement.

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## 1. Introduction

Most empirical studies of the effect of implementing the multilateral agreements negotiated during the Uruguay Round pointed to the potential for small positive, but nonetheless economically significant, gains for the members of the World Trade Organisation (WTO) (Brown, Deardorff, and Stern, 1994; Schott, 1994). Many factors will determine whether these potential gains are fully realized and perhaps one of the most important of them is whether WTO members actually implement their commitments and do not renege on them subsequently. Since these latter actions reflect explicit choices by governments after the Uruguay Round was signed, one is entitled to ask what incentive do WTO members have to stick to the rules, so-to-speak? This question is pertinent when mercantilistic reasoning<sup>3</sup> is still thought to pervade the corridors of power.

The drafters of the Uruguay Round agreements were cognisant of the need to encourage WTO members to fulfil their obligations and introduced into the WTO architecture an enhanced dispute settlement procedure. Others are far better qualified to describe and to analyse the legal aspects of this reformed procedure (see, for example, Jackson 1998a,b). Here, however, I will focus on the implications of the bilateral nature of sanctions on trade in goods and services for the strength of incentives supplied to a country to adhere to its market access commitments.<sup>4</sup> This is not to suggest that other forms of retaliation are unimportant (as the discussion of the “cross-retaliation” issue makes clear). Indeed, if my analysis found that only weak compliance incentives were created by the potential threat of trade sanctions, then this might suggest a greater role for non-trade based sanctions.

I recognise that an assessment of the amount of overseas market access that a WTO member could lose if it fails to adhere to its WTO commitments is not

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<sup>3</sup> One crude characterisation of the implications of such thinking is that a nation’s exports are viewed by its policymakers as good and that its imports are bad (or undesirable.)

<sup>4</sup> Such trade-related sanctions can be expected to reduce exports of the affected good(s) from the sanctioned nation to the sanctioning nation, and may reduce the profits and employment levels in the sanctioned economy.

the only factor that will determine the deterrent value of the WTO's Dispute Settlement Understanding (DSU). Other factors are germane too; such as, whether an aggrieved WTO member is willing and able to bring a case to the DSU; the probability that a case results in the sanctioning of retaliation; and the length of time between the initial violation of WTO obligations and the implementation of WTO-authorized sanctions. Each of these three factors is important in their own right and scholars and practitioners have had, and continue to have, much to say about them. Their relevance for this paper is two fold. First, even if the current WTO DSU provisions with respect to these three factors were flawless, the deterrent value of the DSU would still turn on the magnitude of the overseas market access that a nation can expect to lose as a result of violating its WTO obligations. Secondly, and taking a very different tack, to the extent that my analysis shows that the incentives created by potential trade sanctions are weak, any flaws in the three factors mentioned above will further undermine the deterrent value of the DSU system. Therefore, one can interpret the estimates presented here—of the market access protected by trade sanctions—as being overestimates of the actual extent of market access protection under the DSU.

Turning to specifics, for each of the twenty largest exporters in the developing world and for Japan and the United States the overall goal is to estimate the percentage of an economy's imports in the year 2000 that were shipped from those trading partners that also bought sizeable amounts of goods from the economy in question—that is, from the trading partners which have sizeable clout or leverage over the economy in question. As I explain in section 3 below, this involves a number of intermediate steps. The first of which involves differentiating between exports that are more or less prone to effective trade sanctions. In doing so, I will distinguish between a nation's total exports and its "actionable" exports; and in some cases the latter is much smaller than the former.

The second step is to identify which of a nation's trading partners individually import enough of a nation's actionable exports so that the potential for trade sanctions by those trading partners might induce the nation to adhere to its

market access commitments. Each nation, then, is said to have a set of bilateral “enforcers” of its WTO commitments. Furthermore, it is possible to identify those nations that are enforcers of many trading partners’ WTO commitments; and the former can be thought of as forming the “WTO enforcement club.”

The principal empirical finding is that, across the 22 economies considered here, the percentage of these nations’ market access (as measured by their imports) that comes from their respective bilateral enforcers varies markedly from 5 percent (Nigeria) to 95 percent (Malaysia.) Thirteen of these 22 economies imported 80 percent or more of their imports from trading partners that had enough clout to act as bilateral “enforcers,” a term I define precisely later. However, for many of the economies considered here, a considerable proportion of the market access is protected by the potential for sanctions by developing economies, especially those developing country enforcers in East Asia. To the extent that those economies are unwilling or unable to bring cases against WTO members—including other developing economies—and, given the current pattern of bilateral trade flows, the deterrent value of DSU-permitted trade sanctions could be quite seriously compromised. Put another way, without any of the developing economy enforcers identified in this study, in the year 2000 none of the 22 economies (including Japan and the United States) sourced more than 80 percent of their imports from industrial country enforcers.<sup>5</sup> More worryingly, this percentage falls below 50 for ten of the economies studied here—including Japan. From the perspective of maximising compliance with existing WTO obligations, these findings highlight the need to ensure that effective participation in the DSU extends beyond the industrialised world.

This paper’s empirical results also shed light on the asymmetries that result from the effective implementation of the current DSU system. I show how some of these asymmetries arise from differences in the composition of each

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<sup>5</sup> In this study, the industrialised world is said to consist of those economies that are members of the Organisation for Economic Cooperation and Development (OECD). The remaining economies are classified as developing economies.

nation's exports (which influences the amount of actionable exports) and in the distribution of those exports across trading partners (which determines how many such trading partners have enough clout to become potential enforcers.) For example, for the 22 economies considered here, the number of potential enforcers varies from two to 14 (with the United States and Japan having 12 and 13 potential enforcers respectively.)<sup>6</sup> Another interesting finding is that, for 8 out the 20 largest exporters in developing world, the percentage of their total imports that comes from their respective enforcers exceeds that of the United States. Again, however, much of this protected market access results from the potential for sanctions by developing economy enforcers—stripping out the contribution of the latter reduces from 8 to 3 the number of large developing economy exporters that are under pressure from bilateral trading partners to protect more market access than the United States. If one's view is that industrialised economies, such as the United States, should face stronger incentives to comply with their WTO obligations than developing economies and if the finding (stated above) that 8 out of 20 leading developing economies face stronger incentives than the United States confirms one's fears about asymmetries in the operation of the current DSU; then one might be surprised to learn that it is developing countries' own potential participation in the DSU that is responsible for the creation of this asymmetry in 5 out of 8 cases. Essentially, the growth and prevalence of so-called South-South trade in the 1990s has meant that the deterrent value of the DSU is more dependent on developing economies holding other developing economies to account.

This paper is organised as follows. The next section contains a selective overview of the economic literature on the deterrent value of the DSU. This literature provides additional motivation for the questions asked in, and the scope of, this study. The third section describes the empirical analysis conducted here and the results. Section 4 offers some conclusions.

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<sup>6</sup> As I discuss in section 3, the European Union (EU) is taken to be one trading entity. Therefore, the United States has 11 non-EU enforcers.

## 2. Further motivation provided by elements of the existing literature

International trade economists were quick to spot the implications of game theoretic analyses of sanctions for the enforcement of WTO and GATT disciplines (see Staiger 1995 for a survey.) The threat of sanctions was said to reinforce the incentives for compliance that flowed from the benefits of acquiring, and sustaining, a reputation for good conduct (Bhagwati, 1990; Hoekman and Mavroidis, 1999; Hudec, 1993).

These game theoretic arguments have been thought to best apply to economies with larger markets—a term which more often than not is taken to be synonymous with industrialised economies (Hoekman and Mavroidis, 1999; Horn and Mavroidis, 1999). Indeed, it is often claimed that the deterrent value of DSU-sanctioned trade measures is said to be weaker in developing economies for three reasons. First, to the extent that export interests abroad encourage governments to bring WTO DSU cases, the gains to the former from doing so are likely to be attenuated in economies with small markets.<sup>7</sup> This implies that some developing economies may have little DSU-related incentives to comply with its WTO commitments because—in the terminology employed in the introduction—they have few enforcers of those commitments.

Second, economies with smaller markets may find that the clout wielded by any sanctions that they might impose is tiny; and so they may feel “powerless” to respond to violations by the “big players” in the world trading system. Horn and Mavroidis (1999) contains an example where, it is argued, Costa Rica’s ability to sanction cars made in the EU is limited because European automobile producers can easily redirect the small amount of lost sales (that Costa Rican sanctions might cause) to new markets. In contrast, it is asserted that the EU is such a large market for Costa Rican coffee that sanctions by the EU against this Costa Rican export would be quite damaging. In the terminology of the introduction, then, perhaps the conclusion we are to draw is

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<sup>7</sup> Of course, there may be other factors which determine whether an export interest encourages its government to pursue a DSU case. For example, the export interest may believe that the successful winning of a dispute may have value as a precedent in subsequent disputes with other trading partners.

that there is an asymmetry in the enforcers facing the EU and Costa Rica; with the former acting as an enforcer for the latter while the opposite is not true. Examples such as these have led some to propose “collectivising” or “multilateralising” sanctions in the WTO (see Hoekman and Mavroidis, 1999, amongst others.)

Third, to the extent that developing economies import large quantities of capital equipment and alike from industrialised economies, then the former are unlikely to put sanctions on goods that are thought to promote their development. Of course, arguing from first principles, economies can retort that the imposition of trade sanctions by any economy—whether as result of a DSU case or not—is, under most circumstances, welfare reducing (see Anderson, 2002, for a recent restatement of this view in the context of the operation of the DSU.) Such arguments further diminish the deterrent value of DSU-sanctioned trade remedies if a nation fears that the harm done to themselves by imposing sanctions is unlikely to be sufficiently compensated by the potential benefits of improved behaviour by its trading partners.

The emphasis in the literature on the differences across industrialised and developing economies in the deterrent effect of the DSU motivated my decision to develop (perhaps crude) measures of the strength of those incentives for the United States and Japan; and to compare them with several developing economies. The developing economies I chose to focus on were the twenty largest exporters and this was to see whether the quite plausible conjectures concerning the DSU’s incentives for developing economies with relatively smaller markets (the Costa Rica’s of this world) carried over to those developing economies with the greatest participation in the world trading system. If so, this might strengthen the arguments—and policy recommendations—advocated in papers such as Hoekman and Mavroidis (1999). If not, and there are distinctions between different types of developing economies, then further nuance may be required in assessing the impact of the DSU on the developing world and in devising policy recommendations.

My analysis was also motivated by another factor that has tended to be overlooked in the economic literature on DSU enforcement; but has received more attention in the literature on the more general question of the effectiveness of trade sanctions (of which Hufbauer, Schott, and Elliott, 1990; and Haass and O'Sullivan, 2000, are leading examples.) The key argument that I wish to advance is that the impact of trade sanctions on the target economy and on the sanctioning economy is likely to differ across goods. For relatively homogenous goods which are traded on organised exchanges, sanctions by any one economy against the supplier of such a good are likely to be met by a straightforward reshuffling of trade flows—whereby the exports of the sanctioned homogenous good are shipped elsewhere and replaced by shipments of the same good from a non-sanctioned economy. This reshuffling of trade flows will have no effect on prices unless the sanctioning economy's purchases from the sanctioned economy of the good in question constitute a large share of the worldwide transactions in that good. The fulfilment of these latter conditions is likely to be the exception and not the rule; and in general one can expect sanctions on homogenous goods to have no effect of the price and the quantity that the sanctioned economy can export abroad.<sup>8</sup> This argument suggests that the amount of a nation's exports that are at risk of trade sanctions (whether DSU-related or not) can be smaller than their total exports; potentially eroding the deterrent value of those sanctions and any incentives for compliance created by these measures.

Another potentially important consideration is that mercantilistic (and perhaps other types of) policymakers are almost certainly loathe to impose trade sanctions on the very parts and components purchased by their own export industries. With the spread of international outsourcing throughout the 1990s (Feenstra, 1998; Hummels, Ishii, and Yi, 2000), more industries rely on the fast and efficient importation of parts and components to sustain their export competitiveness. Such outsourcing has increased partly because of trade liberalisation in the developing world, and the growth of trade in parts and

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<sup>8</sup> This is not to deny that there may be some transitory disruption to markets that results from the imposition of the sanctions. However, private agents have strong incentives to keep these disruptions to a minimum.

components has regularly exceeded the overall growth of world trade in the 1990s. Nowhere has this phenomenon been more pronounced than in East Asia, an outcome that derived great impetus in the early 1990s with the decisions by Japanese multinational firms to source more of their parts and components offshore. Governments are well aware of these changes—in particular the link between export competitiveness and international outsourcing—and are thus highly unlikely to sanction such parts and components trade; further reducing the amount of international commerce at risk of trade sanctions, or in terminology of this paper, further reducing the amount of actionable exports.

To sum up, in addition to the bilateral asymmetries mentioned in the existing literature, I have advanced two arguments as to why the amount of actionable exports is likely to be smaller than previously thought; which in the context considered here may further undermine the deterrent value of the DSU system. The primary goal of the remainder of this paper is, using data on international trade flows, to assess the quantitative importance of these arguments; examining the extent to they reduce the amount of market access that, in principle, can be protected by DSU-permitted trade sanctions.

### **3. Empirical implementation**

The principle data source for this study was Statistics Canada's *World Trade Analyzer*. Based on international trade flows data reported to the United Nations, this database includes observations on bilateral trade in goods between just under 200 territories and territories for the twenty years from 1980 to 2000.<sup>9</sup> This international trade data can be disaggregated into broad product groupings, down as far as the 4-digit Standard International Trade Classification (SITC) of products and commodities. Statistics Canada performs a number of adjustments to the United Nations trade data, including carefully separating out an entropôt's own imports from those goods that are re-exported to other destinations. Other adjustments follow from attempts to

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<sup>9</sup> Note, trade in services is not included in this database. As a rule, trade in services is much poorly measured than trade in goods.

reconcile substantial differences in the reported exports of (say) nation A to nation B and the imports reported by nation B that originated in nation A. The widespread use of this database by academic economists is a testament to its quality. Having said that, its principal weakness derives from its dependence on the underlying United Nations' trade data. As has been argued elsewhere, there is believed to be substantial misreporting of certain exports of commodities, most notably oil, and considerable under-reporting of trade between African economies (for details see Rozanski and Yeats, 1994.) The misreporting of oil exports is a cause for concern here as four of the developing economies, whose trade flows I analyse in some detail below, are major oil exporters. I looked for anomalies in the imports and exports data of these four oil producing economies, and the data for Nigeria looks particularly suspicious.

The **first step** in my empirical analysis was to identify the twenty economies that exported the most goods in 2000 and that were not members of the OECD. (Here a country that is a member of the OECD was said to be industrialised; all others are said to be developing countries. It is worth noting that Korea and Mexico are currently OECD members and therefore were not classified as developing economies for the purposes of this study.) Using the current membership information of the OECD and calculating total exports of each nation and territory in the Statistics Canada database in the year 2000, I located the twenty largest exporters that are also developing economies. This procedure identified the following twenty top exporting economies in the developing world: Algeria, Argentina, Brazil, Chile, China, Hong Kong, India, Indonesia, Iran, Kuwait, Malaysia, Nigeria, the Philippines, Saudi Arabia, Singapore, South Africa, Taiwan, Thailand, United Arab Emirates, and Venezuela. To obtain a sense of the magnitudes at stake, in 2000 Kuwait exported US\$19.528 billion and China exported US\$270.574 billion; the smallest and largest exports recorded by these 20 exporters. Meanwhile, Japan exported US\$504.719 billion and the United States exported US\$802.580 billion. (All of these numbers were expressed in current 2000 US dollars.)

The **second step** was to assemble the bilateral matrices for all of the economies in the world in 1990 and in 2000.<sup>10</sup> (These matrices contain all of the recorded imports and exports between every economy in the given years.) It is well known that the trading patterns of small island economies, such as the Bahamas, tend to deviate from the norm, and so I eliminated from these trade matrices any trade involving economies whose populations are less than one million people and whose gross domestic products was less than US\$5 billion in 1999 (the last year for which internationally comparable gross domestic product data was available on the World Bank's *World Development Indicators 2001* database.)<sup>11</sup> Note that each bilateral trade matrix is constructed so that the bilateral trade flows can be broken down into 4-digit SITC product categories.

The **third step** was to compute the amount of “actionable” exports that each of the twenty developing economies selected above, and that Japan and the United States, exported in 1990 and in 2000. As I argued earlier, there are reasons for believing that trade in relatively homogenous goods and in parts and components are not likely targets for sanctions whose aim is to seriously punish a trading partner—either because they are likely to compromise the export competitiveness of the sanctioning economy or because the sanctions will merely reshuffle trade flows in the affected product. The goal then is to strip out of national export flows those trade flows associated with homogenous goods, parts, and components; and it is here that the data on trade in distinct product categories is employed.

First, I employed James Rauch's well known classification of the 4-digit SITC product categories into 3 types: those goods traded on organised exchanges; those goods that are “reference priced”, and the remaining products that are considered to be “differentiated.”<sup>12</sup> Products traded on organised exchanges or markets, such as lead, come closest to the definition of homogenous

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<sup>10</sup> Data on 1990 was collected as well as for 2000 so as to permit certain inter-temporal comparisons to be made (as will become clear later.)

<sup>11</sup> In studies of bilateral trade flows, eliminating the trade associated with small economies in the manner described here is standard practice.

<sup>12</sup> Rauch (1999).

goods. That is because one market price tends to prevail for such commodities and, by implication, the price is quoted irrespective of the identity and location of the supplier. Rauch identified another set of products which do not trade on organised markets, however, buyers and sellers find it useful to list prices of such products in industry magazines and alike. These so-called references prices also do not refer to a given manufacturer or product, which suggests that the products of different manufacturers must be sufficiently similar in the eyes of buyers and sellers. Rauch employed industry sources to classify products into these three groups; and to be safe produced a “liberal” and a “conservative” classification of the 4-digit SITC categories.<sup>13</sup> For my purposes, I considered only the goods traded on organised markets as homogenous; probably underestimating the amount of trade in such goods. Using the bilateral trade matrices described earlier, I computed for each nation the total amount of exports in each of the goods traded on organised exchanges that Rauch identified. I performed this calculation using his liberal and conservative classifications and for the years 1990 and 2000. The calculations are reported in table 1.

Turning now to trade in parts and components, I took advantage of the reclassification of the SITC categories in the mid-1990s to identify those product categories where “parts” and “components” were included in the descriptor of the product category and where a related final good could be identified also.<sup>14</sup> Unfortunately, the latest year for which I have parts and components data is 1997 and so I computed the total exports of these goods by each of the 22 economies considered here in 1990 and in 1997. The 1997 trade data is, of course, reported in 1997 US dollars and so I converted these reported trade flows into 2000 US dollars using the U.S. price deflator; this ensures that the data on trade in parts and components is expressed the same year’s dollars as the bilateral trade data described earlier and the trade

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<sup>13</sup> As the descriptors suggest, the latter included fewer four digit categories of goods classified as traded on organised exchanges and as traded with reference prices than the former.

<sup>14</sup> Essentially, this involved checking that for each product category involving parts and components (for example “automobile parts”) there exists a final good category in which the parts and components were plausibly used in production (“automobiles” to complete the example.)

in homogenous goods described in the last paragraph. The amount of trade in parts and components in 1990 and in 2000 is reported in table 1.

On the assumptions made earlier about the effectiveness of trade sanctions against homogenous goods, parts, and components, I calculated the total value of essentially non-actionable trade that each economy exports. These calculations are reported in the sixth and final columns of table 1; and this table is sorted according to the amount of non-actionable exports in 2000. Large amounts of exports in parts and components account for most of the reported levels of non-actionable exports in East Asia. Whereas, oil exports account for Iran's, Venezuela's, Nigeria's, and Saudi Arabia's large recorded amounts of non-actionable exports.

Further interpretation is possible in table two, which reports the percentage of each nation's exports that are neither homogenous goods, nor parts, nor components. Thus, this table indicates what percentage of a nation's exports are actionable—or at risk from trade sanctions. This table is sorted by the proportion of actionable exports in 2000. Several findings emerge; some surprising, some not. Notice, first, that in 2000 four oil producers (Nigeria, Saudi Arabia, Venezuela, and Iran) have the least actionable exports (as a percentage of total exports.) Notice, also, how only 48 percent of Chile's exports are actionable in 2000, thanks in large part to sizeable copper exports. In the other seventeen economies, however, the share of exports that are actionable is 74 percent or more. This latter finding suggests that most of the economies considered here have substantial amounts of exports at the risk of sanctions. Moreover, 8 of the developing economies considered have proportionally more exports at risk of sanctions than the United States and 9 have less; suggesting perhaps that endowments of oil and raw materials provide better indicators of the extent of actionable exports than level of development. Figure 1 provides another way to visualise the results in table 1. As can be seen here, parts and components trade plays an important role in reducing actionable exports in East Asia, the United States, and less so in Brazil. Other than the oil exporters, trade in homogenous goods reduces actionable exports in Argentina, India, South Africa, Brazil, and Chile.

Given the substantial growth in trade during the 1990s, it is worth asking whether actionable exports grew as quickly as total exports from 1990 to 2000. Table 3 sheds light on this issue. The results for Nigeria are bizarre and should probably be ignored (recall, the remark I made earlier about this economy's trade.) Other than that, there is a wide variation across countries in the growth of actionable exports; which, by and large, is higher in economies where total export growth is faster. The growth of actionable exports (see also figure 2) could be seen as encouraging, if one takes the perspective that countries are more likely to adhere to their multilateral commitments if they have more exports at risk of sanctions.

Two further aspects of the growth of actionable exports are worth noting. First, as figure 2 makes clear, the top 4 economies in terms of actionable export growth are in East Asia (Hong Kong, Singapore, Thailand, and the Philippines.) Each of these 4 economies saw their actionable exports double during the 1990s. Second, there is little evidence of convergence across economies in the percentage of exports that are actionable. One indication of such convergence is if the percentage increase in actionable exports during the 1990s is negatively correlated with the percentage of actionable exports at the beginning of the decade (1990.) In fact, as shown in figure 3, there is a positive rather than a negative correlation between these two variables; suggesting divergence across economies in the percentage of exports at risk of sanctions.<sup>15</sup> This highlights one difficulty in designing incentives to comply with WTO obligations; namely that the composition and growth of exports varies considerably over economies and over time. This, in turn, suggests that the incentives supplied by trade-based sanctions are unlikely to be symmetric or to remain constant over time.

The **fourth step** of the empirical analysis was to identify for each exporter the trading partners that have enough clout to potentially influence the exporter's commitments to adhere to its WTO obligations. These trading partners are

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<sup>15</sup> The simple correlation coefficient between these two variables is 0.39.

ones that buy a substantial amount (or proportion) of an exporter's goods. I employed three thresholds for identifying such trading partners; the so-called "enforcers" that I referred to in the introduction. First, I located those trading partners which bought more than US\$1 billion of the exporter's goods in 2000. Second, I found those trading partners that bought more than 1 per cent of the economy in question's exports in 2000. The third threshold is like the second, except that a 0.5 per cent cut-off was used. Furthermore, given my emphasis on actionable exports, for every economy and for the 3 thresholds mentioned above, I calculated the number of trading partners which bought more than the respective threshold about of actionable exports.<sup>16</sup> For all of these calculations, I took the members of the European Union (EU) to be a single trading partner, reflecting their joint representation at the WTO. The results are presented in table 4.

Comparing across the three thresholds, it is apparent that the US\$1 billion of trade threshold is far more restrictive than the half a per cent of exports threshold; as every developing economy has far fewer potential enforcers among its trading partners on the former than on the latter. The 1 per cent of exports threshold tends to provide results that lie between the other two; and employing this criterion on actionable exports reveals that the number of enforcers varies from 3 (Venezuela) to 14 (South Africa and the Philippines.) In fact, only the latter two nations have more enforcers than Japan and the United States; while 11 developing economies have fewer enforcers.

Based on the 1 per cent threshold for identifying enforcers, figure 4 highlights the importance of distinguishing actionable exports from total exports. In only 3 economies (China, Taiwan, and Argentina) is the number of enforcers the same after eliminating non-actionable exports. In contrast, focusing on those exported goods where sanctions are more likely to have an effect reduces the

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<sup>16</sup> That is, for a given economy considered here, first I calculated the number of trading partners that purchased more than a US\$1 billion of actionable exports. Second, I calculated the number of trading partners whose purchases of actionable exports exceeded the 0.5 per cent of the economy in question's total exports. Third, I calculated the number of trading partners whose purchases of actionable exports exceeded the 1 per cent of the economy in question's total exports.

number of enforcers considerably for South Africa, India, Argentina, Chile, Saudi Arabia, Iran, Venezuela, and Nigeria. In fact, in 6 of these economies eliminating non-actionable exports reduces the number of enforcers to below 10 each. The findings in figure 4 can be put bluntly, in terms of impact on their exports, 9 of the economies considered here probably fear retaliation from only 10 of the 130 or so WTO members; begging the question of how well they treat imports from the other members of the WTO.

Table 5 provides a different cut on the results (again using the 1 per cent threshold on actionable exports) and reports how often each economy is an enforcer to the 22 economies considered in this study. In reporting the results, I have stated the number of developing economies that a country is an enforcer for, and whether or not the country is an enforcer for the United States and for Japan. For example, Mexico is an enforcer to 4 of the top 20 exporters in the developing world, as well as to the United States and to Japan. Looking across the candidate enforcers, not surprisingly, the European Union and the United States are enforcers to almost all of the top 20 exporters in the developing world. More interesting is the fact that 6 East Asian economies (Korea, Japan, Singapore, China, Hong Kong, and Taiwan) are enforcers for at least half of the developing economies considered here; and all are enforcers for the United States and Japan.<sup>17</sup> Indeed, the top 13 enforcers of the leading exporters of the developing world come from Europe, North America, or East Asia. Not a single Latin American economy, African economy, or South Asian economy is an enforcer of more than 4 of these exporters. Even more striking, only 3 of the economies in Latin America, Africa, and South Asia are enforcers to the United States or Japan. This demonstrates just how few economies are effective members of what might be called the WTO enforcement club.<sup>18</sup>

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<sup>17</sup> Obviously, Japan is not an enforcer of itself.

<sup>18</sup> Having a small number of members in the WTO enforcement club may be appealing on the grounds that few economies will have to bear the costs of participating fully in the WTO's DSU. This argument may be all the more compelling at a time when concerns about the implementation costs of multilateral trade agreements resonate widely. However, to the extent that members of the WTO enforcement club decide not to bring actions against one another (on the grounds that "everyone's a sinner")—essentially creating a cabal of non-enforcers—then, this clearly undermines the pressures to comply with WTO obligations. Another worrying alternative is that club members treat each other honourably, however, they direct any non-

The right hand panel of table 4 computes the percentage of each economy's exports which are accounted for by their respective enforcers. This provides one measure of the amount of leverage that each economy's enforcers have over its exports. For example, on the 1 per cent threshold with actionable exports only, 67 per cent of America's exports are shipped to her enforcers. This table shows that 9 of the top 20 exporters in the developing world have proportionally less exports at risk of sanctions from enforcers than the United States; casting doubt on any sweeping claims that developing economies as a rule are more exposed to sanctions from WTO dispute settlement than industrialised economies.

In the analysis pursued here, two factors are responsible for reducing the percentage of a nation's exports that are due potentially exposed to sanctions from leading trading partners. The first is that not all exports are actionable. The second is that some trading partners only buy a small proportion of a nation's exports. Using the data reported in table 4, figure 5 decomposes the reduction in the total amount of exports that are sanctionable by enforcers into these two component parts. Consider Singapore, on the 1 per cent criterion, exports to non-enforcers accounted for only  $9=(100-91)$  per cent of her total exports in 2000. In contrast, after stripping out non-actionable exports and recalculating the number of enforcers that still buy more than 1 per cent of Singapore's total exports, 71 per cent of her exports are potentially subject to sanctions from enforcers. Stripping out non-actionable exports has, therefore, reduced her exposure to sanctions by  $20=(91-71)$  per cent and is more than twice the reduction due to exports to non-enforcers. The overwhelming message from figure 5 is that exposure to sanctions is reduced far more by non-actionable exports than it is by exports to relatively small export markets (non-enforcers).

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compliance towards non-members. Indeed, it would be interesting to see if, for a given member of the WTO enforcement club in (say) 1995, whether the share of its markets supplied by economies that are outside the WTO enforcement club has fallen during 1996-2000; controlling for all of the other determinants of bilateral trade flows.

Pursuing the Singaporean example a little further, we know from table 2 that Singapore's actionable exports account for 75 per cent of its total exports. As noted in the last paragraph, Singapore's 12 enforcers already import 71 per cent of her exports. This implies that a move from collective sanctions by these 12 enforcers to multilateral sanctions would increase by a mere 4 percentage points the share of Singapore's exports at risk of sanctions. In terms of increasing clout, therefore, there appears to be little to be gained from enfranchising the non-enforcers; a finding that is by no means limited to Singapore in the economies considered here. In fact, calculations such as these suggest that, as far as strengthening the incentives for WTO compliance is concerned, ensuring that each member of the WTO enforcement club is active might be more promising than moving towards multilateral sanctions.

Now that the enforcers have been identified for each economy, the **fifth step** is to calculate what percentage of each economy's imports is sourced from its respective enforcers. This provides one measure of how much of an economies' market access is potentially protected by trading partners that, in turn, have considerable clout of the economy in question's exports. I performed this calculation using the enforcers that were identified using the 1 per cent and 0.5 per cent thresholds on trade in actionable exports; the results are reported in table 6. In addition, I have broken out the market access that is potentially protected by OECD nations and by developing economies (non-OECD economies.) The data in table 6 are sorted by the percentage of imports from all enforcers when the 1 per cent threshold is used to identify the enforcers. The first observation is that all but three of the economies, two thirds or more of imports are sourced from their respective enforcers.<sup>19</sup> Second, there is no apparent relationship between the level of development and the amount of market access that is potentially protected by WTO dispute settlement. Having said that, there does appear to be an important regional dimension to the results. On the 1 per cent threshold, the economies with the 6 largest percentage of market access protection are all from East Asia.

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<sup>19</sup> All three economies are oil producers.

Earlier I observed that six East Asian economies are potential enforcers to more than half of the leading exporters in the developing world. Here, they are subject to more potential pressure to enforce their WTO commitments. This symmetry does not carry over to other developing economies, however. Consider South Africa. According to table 5, it is not an enforcer to a single one of the top 20 exporters in the developing world; nor is it an enforcer to the United States or to Japan. Yet, in table 6, on the one per cent threshold, three quarters of its imports come from South Africa's enforcers.<sup>20</sup> Maybe this is a desirable outcome as she feels pressure to comply with WTO obligations without having to bear the costs of engaging fully in WTO dispute settlement. However, if the WTO obligations being enforced are not conducive to her development or if she has little leverage over trading partners that might impair market access to her exporters, then casts this finding in a different light.

Figure 6 emphasises the important contribution that non-OECD enforcers can play in strengthening the incentives to adhere to WTO obligations. The economies are ranked in this figure according to the market access that is potentially protected by enforcers from the OECD nations. Without the developing economy (non-OECD) enforcers, 10 of the economies considered here—including Japan—would find imports from the remaining enforcers to be less than half of their total imports. This shows that, after a decade of considerable growth in so-called South-South trade and North-South trade, the pressure to adhere to WTO commitments is critically dependent on role that developing economies, especially those from East Asia, play in WTO dispute settlement. If developing economies are unwilling or unable to participate in the WTO's dispute settlement system, then the incentive for WTO members to stick to the rules will be considerably eroded. This finding

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<sup>20</sup> More generally, future research might be devoted to identifying which countries—developing and industrial—share South Africa's plight. That is, identifying country that have many enforcers of their obligations but are enforcers to no (or a small number of) economies. I suspect that some analysts will find this type of asymmetry violates certain norms of fairness. Others may doubt that it can be healthy for the perception of the DSU that (what could be a) large number of WTO members are likely to be only defendants in the dispute settlement system and rarely plaintiffs.

also suggests that certain developing economies may have considerable leverage in negotiations over how to reform the DSU.

Taking account of the important of potential contribution of developing economies to WTO dispute settlement is, it turns out, also a central factor in assessing whether the leading exporters from the developing world face greater pressures to conform to WTO disciplines than the industrialised economies. Figure 7 shows that, compared to the proportion of market access the USA is under pressure to enforce and in terms of the proportion of exports potentially at risk of sanctions, 8 of these leading developing country exporters face more pressure. However, this is largely a function of enforcement pressure from other developing economies! Strip out the latter, and only three of these leading exporters face more pressure (along both dimensions considered in figure 7) than the United States. The irony here is that complaints from leading exporters in the developing world about asymmetric pressures to conform with WTO obligations are, on this analysis, largely created by other developing economies enforcing their market access rights.

Figure 8 reinforces the point that there is a wide variation in the developing world in the pressures to conform to WTO rules. Figure 8 is identical to figure 7 except that the comparator country is now India, and not the United States. With all enforcers taking part, 10 of India's peers face more pressure to their enforce market access obligations and have proportionally more of their exporters to enforcers than she does. Moreover, this number only drops to 7 if the non-OECD economies cease to enforce their market access rights. It would be interesting to explore whether the variation in the pressure to conform to WTO disciplines is greater within developing world than it is between developing world and the industrial world. Without coming to any definite conclusion, the findings presented here point to the former rather than the latter. This, in turn, has implications as to whether developing economies should seek reforms to the DSU that are intended to bolster compliance in the industrialised world or among their peers.

#### **4. Concluding remarks**

One key component of the World Trade Organisation's Dispute Settlement Understanding is, under certain circumstances, its reliance on bilateral trade sanctions. To date, there has been little analysis of how the actual pattern of bilateral trade flows and the composition of bilateral trade influences the incentive to comply with WTO obligations. In this paper I have computed for over 20 economies that engage in considerable amounts of international commerce, the percentage of their exports that are actionable (or at risk from sanctions from trading partners), the number of trading partners that have import a substantial portion of each economy's exporters and so have some clout over the exporter's behaviour (the so-called enforcers), and the percentage of each economy's imports that are potentially protected by those enforcers. The latter can be thought of as a proxy for the pressure to protect market access that is induced by the potential for DSU-authorized bilateral sanctions. The results showed a wide variation in such pressure across economies. This variation is better accounted for differences in endowments of oil and raw materials and by differences in the amount of parts and components trade than by differences in the level of development. Indeed, the variation among developing economies in what might be thought of as the pressure to conform to WTO disciplines appears to be greater than the variation between these developing economies and Japan and the United States. It would seem, then, that straightforward North versus South characterisations of the potential impact of bilateral sanctions under the DSU are misplaced. Furthermore, the analysis revealed that, after decades of relatively faster export and import growth, the important role that the middle income nations in East Asia can play in encouraging developing and industrialised economies to comply with their WTO obligations.

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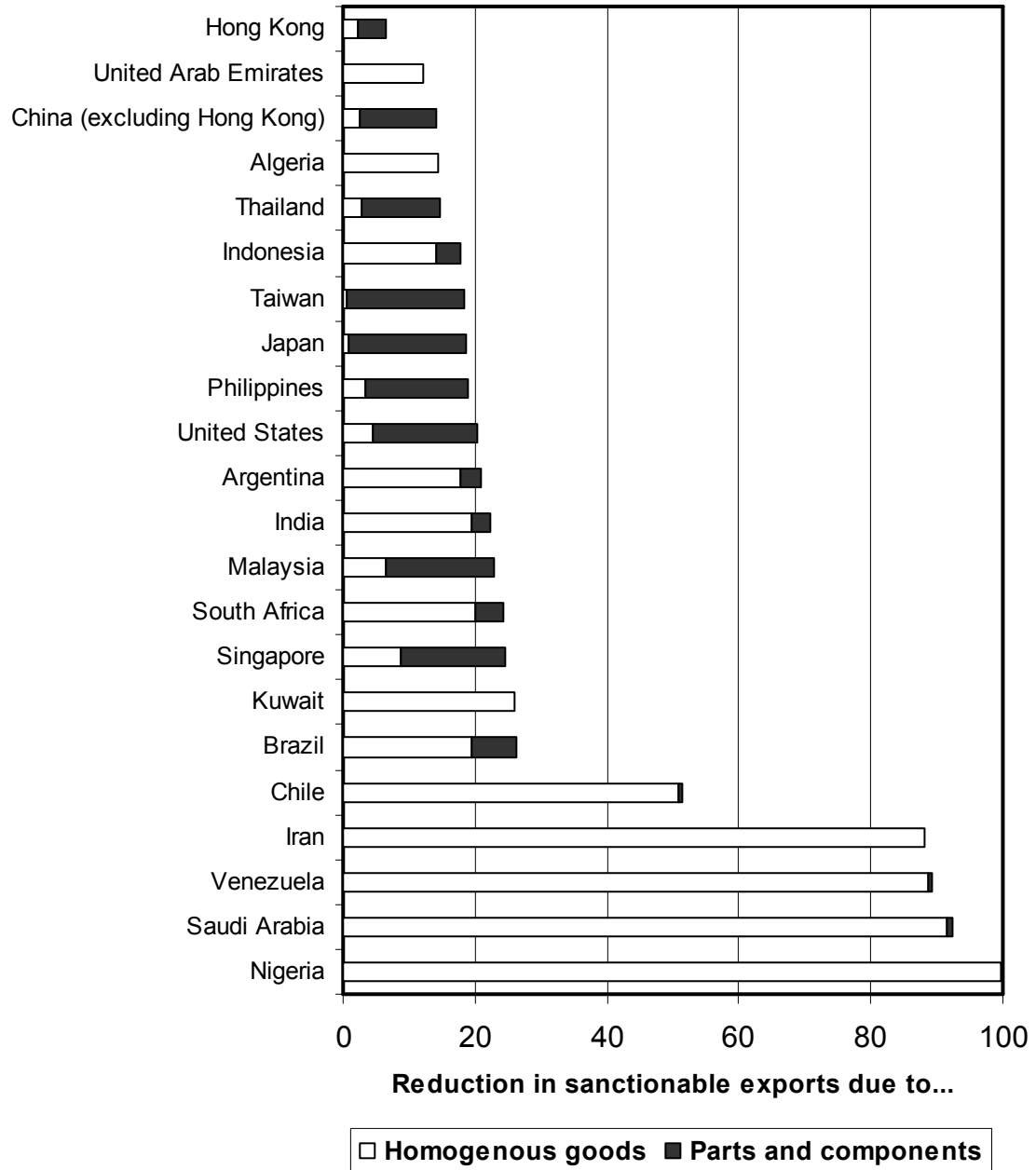
**Table one: Calculating the amount of non-actionable exports for each country**

Economy	1990 exports (millions of US dollars)				2000 exports (millions of US dollars)					
	Total exports	Homogenous goods		Parts	Parts plus Liberal definition of homogenous goods	Total exports	Homogenous goods		Parts (1997 exports in 2000 prices)	Parts plus Liberal definition of homogenous goods
		Liberal definition	Conservative definition				Liberal definition	Conservative definition		
Algeria	11024	2250	2232	11	2262	23171	3358	3293	6	3364
United Arab Emirates	23789	688	580	0	688	39145	4795	4333	0	4795
Kuwait	8236	2083	2039	0	2083	19528	5052	5031	0	5052
Argentina	12932	3164	2972	237	3401	28261	5030	4314	906	5936
South Africa	25086	5402	3624	246	5648	28000	5617	2677	1199	6816
Philippines	8437	1189	840	634	1823	40506	1376	1231	6307	7683
Chile	9031	5127	4034	30	5157	19704	10007	5824	147	10154
India	18545	3744	819	394	4138	47829	9343	2249	1272	10615
Thailand	23801	536	194	1559	2094	72765	2013	1397	8694	10707
Indonesia	28066	5512	1963	300	5813	65529	9334	4138	2250	11584
Hong Kong	83830	2245	984	8119	10363	206332	4534	1865	8630	13163
Brazil	33437	7629	6498	1642	9271	59748	11666	8965	4108	15774
Malaysia	30508	4336	2248	2716	7052	104436	6882	4955	16978	23860
Iran	16664	15520	15488	0	15520	29609	26106	26052	0	26106
Venezuela	13025	10407	10242	92	10499	33411	29600	29386	248	29848
Taiwan	71298	829	491	8550	9379	167214	991	774	29691	30682
Singapore	53209	9994	9565	5724	15718	138699	12240	11788	21933	34173
China (excluding Hong Kong)	64897	2723	2083	3095	5818	270574	6825	5357	31299	38124
Nigeria	13525	12891	12777	0	12891	39018	38888	38873	0	38888
Saudi Arabia	45904	39983	39786	115	40097	83336	76361	76222	520	76881
Japan	293632	2106	1675	58449	60555	504719	4001	3045	89569	93570
United States	413384	27761	11242	64740	92501	802580	35180	17538	127008	162189

**Table two: Calculating the proportion of exports that are "actionable," by country**

Economy	Percentage of 1990 exports that are NOT				Percentage of 2000 exports that are NOT			
	Homogenous goods		Parts	Parts or homogenous goods (liberal definition)	Homogenous goods		Parts (1997 data)	Parts or homogenous goods (liberal definition)
	Liberal definition	Conservative definition			Liberal definition	Conservative definition		
Nigeria	5	6	100	5	0	100	0	
Saudi Arabia	13	13	100	13	8	99	8	
Venezuela	20	21	99	19	11	99	11	
Iran	7	7	100	7	12	100	12	
Chile	43	55	100	43	49	99	48	
Brazil	77	81	95	72	80	93	74	
Kuwait	75	75	100	75	74	100	74	
Singapore	81	82	89	70	91	84	75	
South Africa	78	86	99	77	80	96	76	
Malaysia	86	93	91	77	93	84	77	
India	80	96	98	78	80	97	78	
Argentina	76	77	98	74	82	97	79	
United States	93	97	84	78	96	84	80	
Philippines	86	90	92	78	97	84	81	
Japan	99	99	80	79	99	82	81	
Taiwan	99	99	88	87	99	82	82	
Indonesia	80	93	99	79	86	97	82	
Thailand	98	99	93	91	97	88	85	
Algeria	80	80	100	79	86	100	85	
China (excluding Hong Kong)	96	97	95	91	97	88	86	
United Arab Emirates	97	98	100	97	88	100	88	
Hong Kong	97	99	90	88	98	96	94	

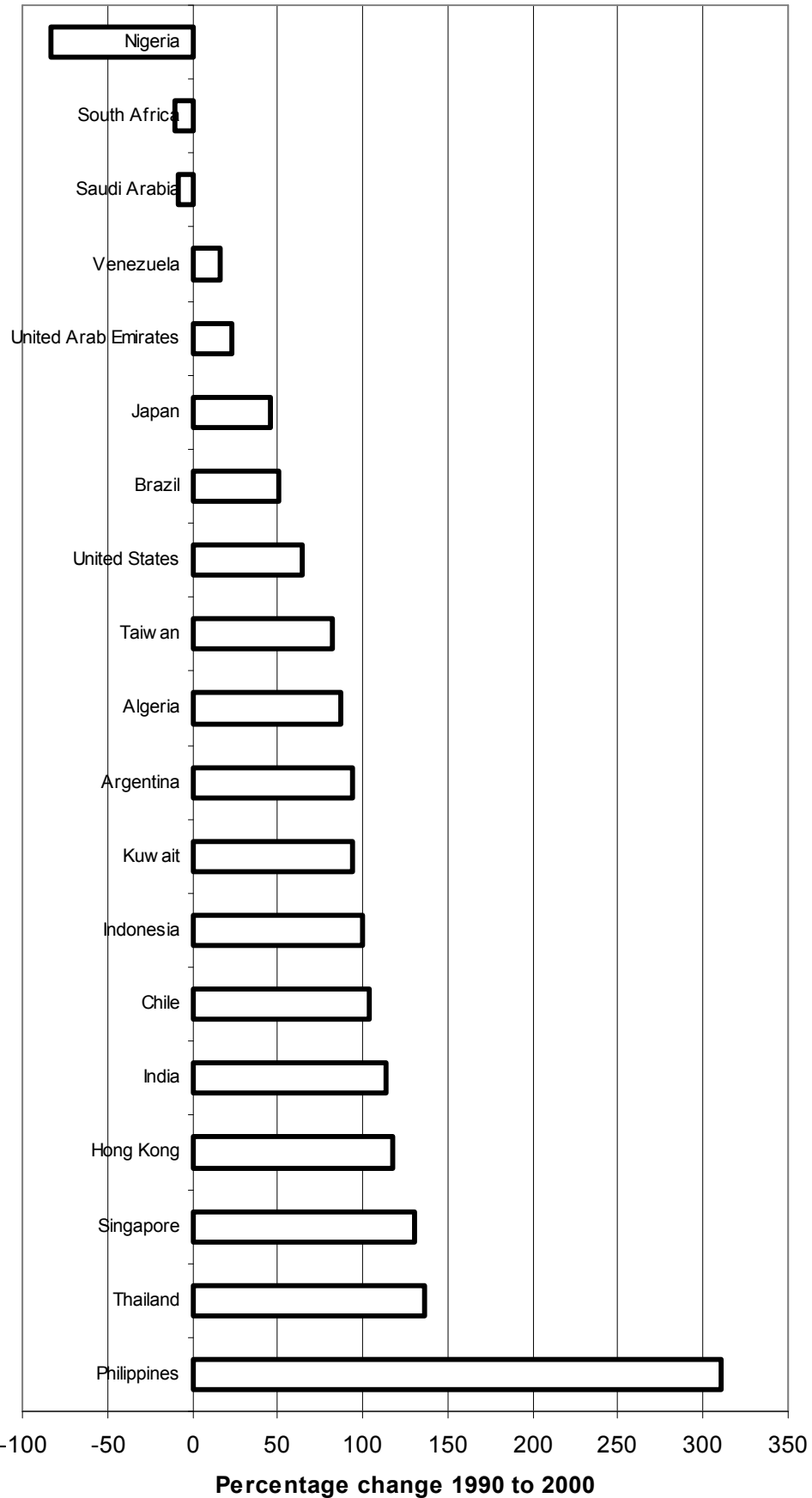
**Figure one: Not all exports are sanctionable...and the proportions vary a lot across countries**



**Table three: During the 1990s the growth of actionable exports greatly across countries**

Economy	Actionable exports				Comparator
	1990 (current dollars)	1990 (2000 dollars)	2000 (current dollars)	Real percentage change	Real percentage change in total exports
Nigeria	634	767	129	-83	140
South Africa	19438	23521	21184	-10	-7
Saudi Arabia	5806	7026	6455	-8	51
Venezuela	2527	3057	3563	17	113
United Arab Emirates	23101	27953	34350	23	37
Japan	233077	282031	411149	46	43
Brazil	24166	29241	43974	50	49
United States	320883	388279	640392	65	62
Taiwan	61918	74923	136532	82	95
Algeria	8763	10603	19806	87	75
Argentina	9531	11533	22325	94	82
Kuwait	6152	7444	14476	94	97
Indonesia	22253	26927	53945	100	94
Chile	3874	4688	9550	104	82
India	14406	17432	37214	113	115
Hong Kong	73467	88897	193168	117	105
Singapore	37491	45365	104526	130	117
Thailand	21706	26265	62058	136	154
Iran	1144	1385	3503	153	48
Malaysia	23456	28383	80576	184	185
China (excluding Hong Kong)	59079	71487	232450	225	247
Philippines	6614	8003	32823	310	299

**Figure two: Although most nations saw a growth in actionable exports in the 1990s, the variation across countries is substantial**

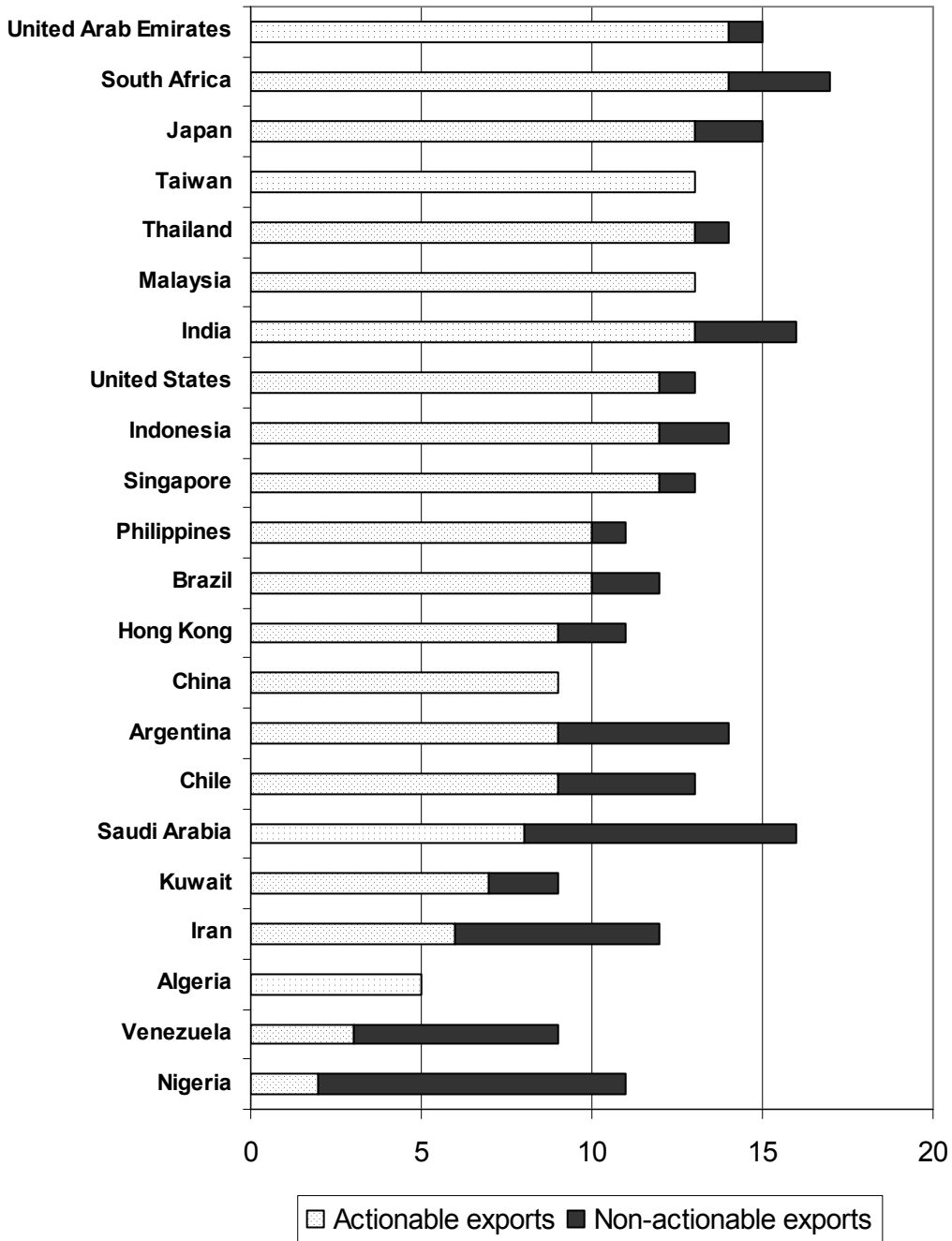




**Table four: Identifying the number of potential "enforcers" that each nation faces**

Economy	Number of trading partners who import more than...						Percentage of total exports that are accounted for by trading partners who import more than...					
	...a billion dollars		...one percent of the given economy's exports		...half-a-percent of the given economy's exports		...one percent of the given economy's exports		...half-a-percent of the given economy's exports		...half-a-percent of the given economy's exports	
	All exports	Actionable exports	All exports	Actionable exports	All exports	Actionable exports	All exports	Actionable exports	All exports	Actionable exports	All exports	Actionable exports
Venezuela	3	1	9	3	17	7	92	8	98	84	10	87
Nigeria	5	1	11	2	17	2	94	17	99	78	17	82
Saudi Arabia	12	6	16	8	19	10	96	23	98	73	24	74
Iran	5	2	12	6	15	9	94	26	96	69	27	69
Chile	5	3	13	9	18	13	90	40	94	50	43	51
South Africa	3	3	17	14	29	25	85	59	94	26	67	26
Brazil	7	6	12	10	23	18	84	61	92	23	66	25
India	6	3	16	13	22	21	90	64	94	26	70	25
Argentina	4	4	14	9	23	15	86	66	92	20	71	22
Kuwait	6	4	9	7	12	11	96	68	98	28	71	27
Singapore	15	14	13	12	18	16	91	71	94	20	74	21
Indonesia	12	11	14	12	17	16	92	74	93	18	77	17
Malaysia	14	13	13	13	16	15	93	74	95	18	76	19
Thailand	12	11	14	13	22	19	88	76	94	13	80	14
China	18	18	9	9	16	15	86	76	92	10	80	11
Taiwan	14	14	13	13	15	14	95	80	96	15	81	15
Philippines	9	8	11	10	13	13	96	81	97	15	83	14
Untd Arab Em	9	6	15	14	18	17	95	81	97	14	84	14
Algeria	4	4	5	5	8	8	95	81	98	14	84	14
Hong Kong	18	16	11	9	18	16	91	84	95	6	89	6
<i>Memo:</i>												
United States	39	38	13	12	22	18	87	67	93	20	71	18
Japan	27	27	15	13	19	17	92	74	94	18	76	18

**Figure four:  
Countries differ in the number of trading partners that can  
act as "enforcers"**



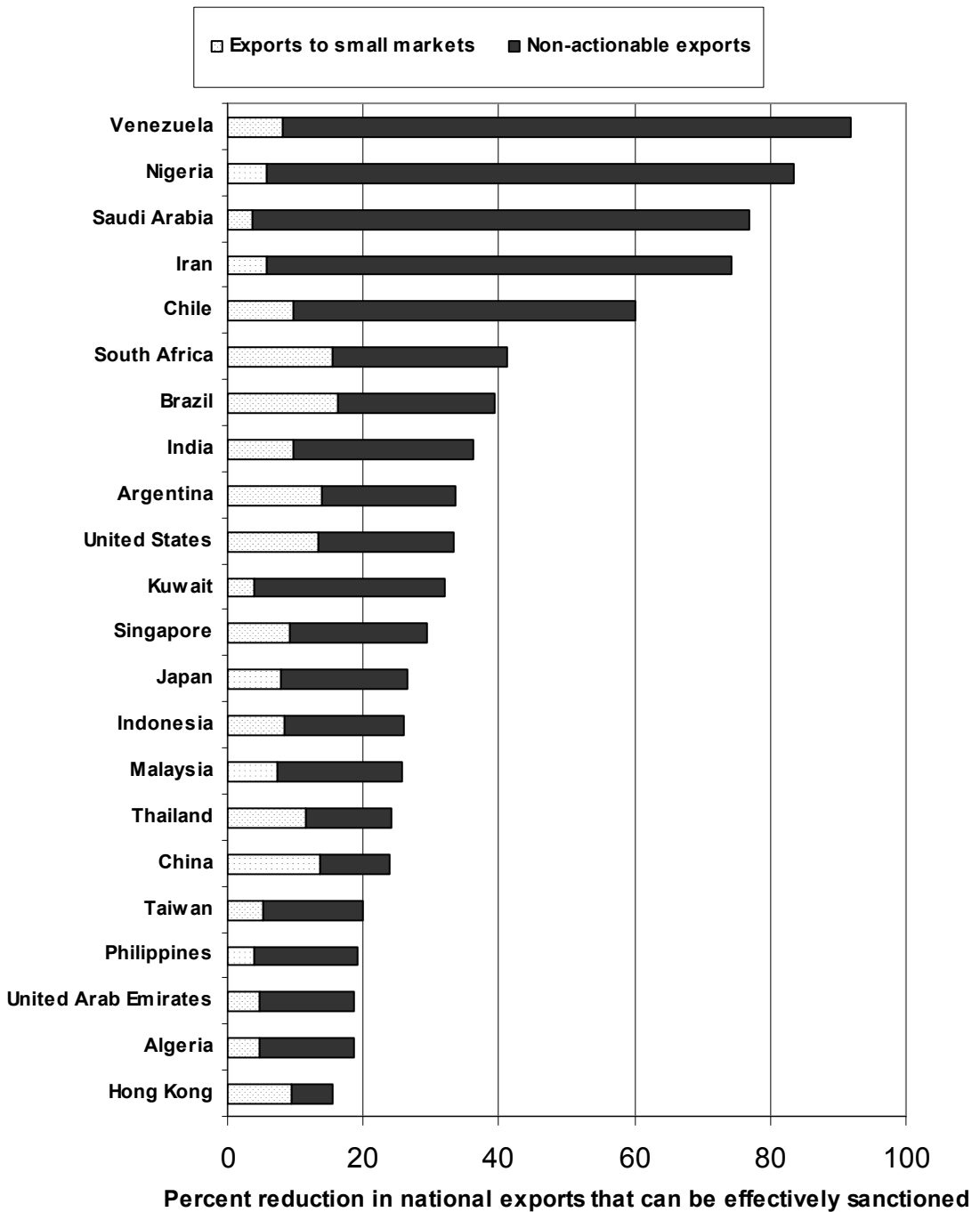
**Table five: Can only OECD nations play a credible enforcement role? No**

Candidate enforcer	Target of enforcement		
	Twenty developing economies considered in this paper	USA	Japan
	Number of trading partners that import enough "actionable" exporters to make them a credible enforcer		
EU members	18	1	1
USA	18		1
Korea Rp	14	1	1
Japan	14	1	
Singapore	11	1	1
China	11	1	1
Hong Kong	10	1	1
Taiwan	10	1	1
Australia	10	1	1
Canada	8	1	1
Thailand	7		1
Malaysia	6		1
Philippines	5		
Mexico	4	1	1
India	4		
Indonesia	4		
Brazil	3	1	
Pakistan	3		
Argentina	2		
Chile	2		
Colombia	2		
Paraguay	2		
Peru	2		
Uruguay	2		
Venezuela	2		
Iran	2		
Saudi Arabia	2		
United Arab Emirates	2		
Turkey	2		
Egypt	1		
Kenya	1		
Malawi	1		
Mozambique	1		
Zimbabwe	1		
Zambia	1		
Oman	1		
Nepal	1		
Vietnam	1		
Panama	0		1
Switzerland	0	1	

Notes: 1. A nation X is said to be a potential enforcer of nation Y if the latter's actionable exports to X constitute more than one percent of Y's total exports.

2. Nations that are enforcers to the US and Japan are incited by [REDACTED]

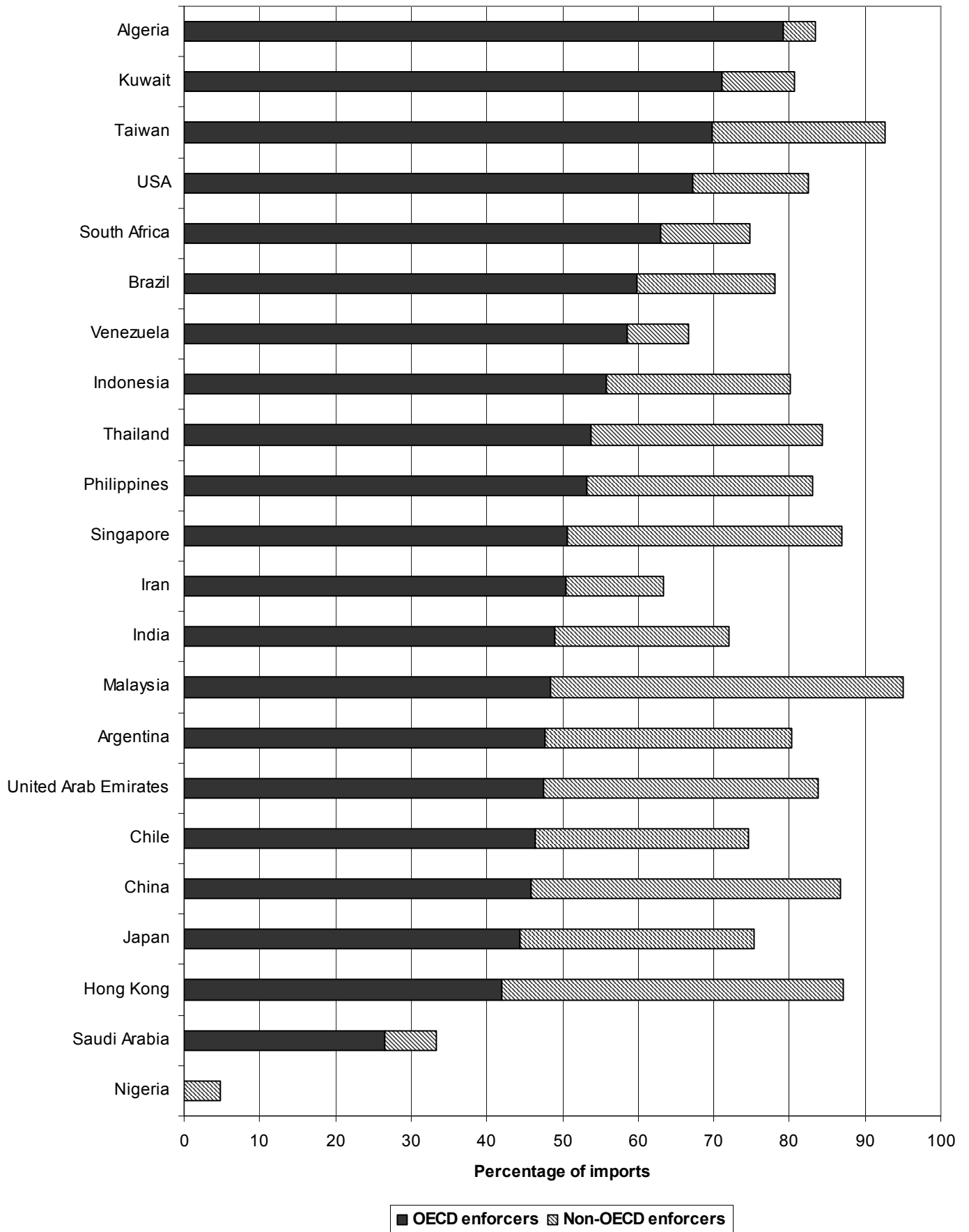
**Figure five: Non-actionable exports tend to erode deterrent value of the DSU more than exports to lesser markets**



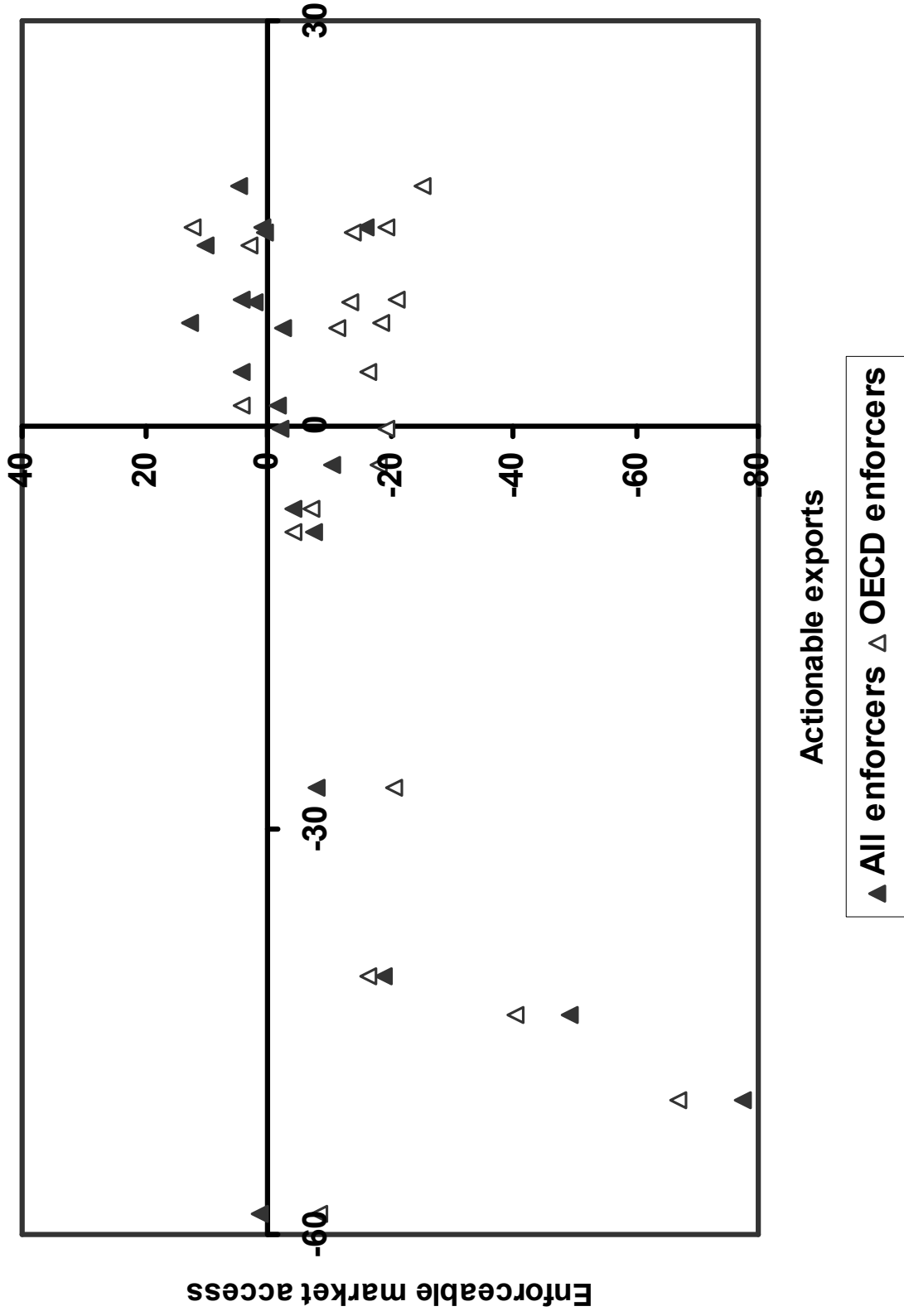
**Table six: What percentage of each economy's imports come from potential enforcers?**

Economy		Trading partners which...									
		...account for more than one percent of economy's exports					...account for more than half of one percent of economy's exports				
		Number		Percent of economy's imports supplied by major trading partners			Number		Percent of economy's imports supplied by major trading partners		
		All enforcers	OECD enforcers	Non-OECD enforcers	All enforcers	OECD enforcers	Non-OECD enforcers	All enforcers	OECD enforcers	Non-OECD enforcers	
Nigeria	2	5	0	5	5	0	5	5	0	5	
Saudi Arabia	8	33	27	7	70	62	8	70	62	8	
Iran	6	63	50	13	68	53	15	68	53	15	
Venezuela	3	67	59	8	73	63	10	73	63	10	
India	13	72	49	23	94	53	42	94	53	42	
Chile	9	75	46	28	80	49	31	80	49	31	
South Africa	14	75	63	12	85	63	22	85	63	22	
Japan	13	75	44	31	90	44	45	90	44	45	
Brazil	10	78	60	18	88	64	24	88	64	24	
Indonesia	12	80	56	24	85	58	28	85	58	28	
Argentina	9	80	48	33	89	53	36	89	53	36	
Kuwait	7	81	71	9	83	71	12	83	71	12	
USA	12	82	67	15	90	67	22	90	67	22	
Philippines	10	83	53	30	86	56	30	86	56	30	
Algeria	5	83	79	4	86	81	4	86	81	4	
United Arab Emirates	14	84	48	36	92	48	44	92	48	44	
Thailand	13	84	54	31	92	55	37	92	55	37	
China	9	87	46	41	93	46	47	93	46	47	
Singapore	12	87	51	36	89	51	38	89	51	38	
Hong Kong	9	87	42	45	95	43	51	95	43	51	
Taiwan	13	93	70	23	95	70	25	95	70	25	
Malaysia	13	95	48	47	96	49	47	96	49	47	

**Figure six: Imports from nations that are potential enforcers...or the amount of each nation's market access that can be defended through WTO dispute settlement**



**Figure seven: Are developing economies exposed to greater potential sanctions than the United States?**



**Figure eight: Are developing economies exposed to greater potential sanctions than India?**

