PAYING THE PRICE: THE WELFARE EFFECTS OF TRADE BARRIERS AND INFLATED DISTRIBUTION MARGINS IN OECD COUNTRIES

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May 2000: First Draft

We present new data on protection and inflated distribution margins in OECD countries and uses an AGE framework to assess the welfare impacts of these distortions. We find that: 1) Further trade liberalization can still bring large welfare gains, even to industrialized countries. 2) Japan's barriers and inflated margins impose large domestic costs that should not be ignored when analyzing the causes of their economic malaise. These Japanese distortions also impose large costs on the rest of the world, especially LDCs. 3) The welfare effects of artificially high distribution margins rival those of trade barriers.

Comments are not only welcome, they are needed! I thank Glenn Harrison and Tom Rutherford for helpful discussions. I also thank Robert Lawrence.

INTRODUCTION

Since WWII, industrialized nations have greatly reduced tariffs, while the share of trade in world GDP has risen steadily. Also, many nations in recent years have opened their markets to foreign competition in an effort to take advantage of the dynamic global economy and spur domestic growth. Such trends indicate that advanced nations are trading ever more freely and that the world economy is becoming ever more integrated.

None of this implies, though, that the nations of the world have approached complete free trade. In fact, the demise of the tariff has rendered other forms of protection more important, making it more difficult to measure the amount of protection in the world economy. This raises the question: How open are nations' markets to international trade? In this study, we present new data on protection in a sample of OECD countries. This data shows that significant barriers to trade remain, despite years of progress within the WTO. We also present internationally comparable data on distribution margins. Many OECD countries appear to impose substantial regulations on the distribution sector. Such restrictions impose welfare costs, just as trade barriers do.

The second half of this paper presents an AGE analysis of the welfare effects of the barriers and high margins reported in the data. We assess the welfare effects by simulating what would happen if these barriers were removed. Thus, this paper is not designed to estimate the effects of actual policy initiatives. Rather, we utilize AGE analysis to estimate the costs of these regulations (and the gains of reform).

There has been considerable debate over questions such as these, but lack of data has prevented a clear and comprehensive analysis of all three. Many researchers have attempted to measure the extent and costs of protection, but most such efforts are unreliable for a variety of reasons, as will be discussed below. A major problem with these studies is that they are not necessarily comprehensive analyses of trade barriers because they focus only on explicit trade barriers—quantitative restrictions, as well as tariffs—and ignore the possible effects of the many other types of restrictions.

As a preview of the results, we find that, once all kinds of barriers are accounted for, international isolation is extensive and that the net gains from full-fledged globalization would be substantial. We also find that the US is the most open economy in our sample, while Japan is the most isolated overall. In addition, we find that inflated margins impose costs that are of the same order of magnitude as trade barriers.

OTHER ATTEMPTS TO MEASURE PROTECTION

The greatest obstacle to accurately measuring the openness of markets is the fact that nations can protect their industries in any of many different ways. Despite the virtual elimination of tariffs, governments continue to protect markets with explicit non-tariff barriers, such as quotas and VERs. Such barriers are prominent in textiles and agriculture. Also, governments use a number of less visible but effective means for insulating domestic markets against foreign competition. These hidden barriers include subsidies (agriculture), heavy-handed regulation (construction, finance), biased government procurement (medical equipment, public transit), lax antitrust enforcement (glass in Japan), unduly restrictive health and safety standards (the US-Europe meat dispute), burdensome customs procedures (France impeding Japanese electronic equipment), unjustified anti-dumping duties, and threats (steel, autos). Also, more indirect policy choices, such as a refusal to enforce contracts, can act as barriers to trade.

Accounting for **all** possible barriers to integration, not just visible ones, clearly is not straightforward. There are 3 main approaches to this thorny problem in the literature. (See Baldwin 1989, Deardorff and Stern 1985, Laird and Yeats 1990, and USITC 1995 for overviews of some of the issues and for other references.) In this section, we will briefly discuss each approach and its shortcomings.[1] In the next section, we will describe our approach.

Method 1: Estimate a trade model and use the gap between predicted and actual trade flows to infer the extent of protection. (See Leamer 1988 and Saxonhouse and Stern 1989.) This approach requires having a trade model that can accurately account for all determinants of trade, besides barriers. This is an overly ambitious requirement for any trade model. One can use the residuals to infer the extent of trade barriers, but who is to say how much of any residual results from barriers and how much results from model misspecification or data mismeasurement or both? Leamer himself is skeptical of the ability of this approach to produce reliable measures of protection.

Method 2: Count Non-Tariff Barriers (NTBs). (See Laird and Yeats 1990 for a description of various NTBs and a survey of other relevant references.) The United Nations has developed set of non-tariff barrier data. They have developed these "NTB incidence measures" by computing what percentage of products within a sector has any kind of NTB. This measure is flawed because it does not take account of how restrictive each barrier is. One sector may have a lot of products that are subject to minor NTB's. Another sector may have just a few products with very restrictive NTB's. The first sector would have a much higher NTB incidence measure, while we would expect the second sector to actually be more restricted by trade barriers. It is also unclear whether all NTB's have been accounted for in the UN's accounting.

Method 3: Infer price gaps by using unit values derived from detailed trade data. (See Sazanami et al 1995, Knetter 1994, and Swagel 1995.) Unit values are notoriously inexact measures of prices because of large quality differences in products. For instance, Sazanami et al derive tariff equivalents by comparing the unit values of domestically produced goods and imported goods in the same product category. It turns out that the unit values of radios and televisions produced in Japan are 6 times higher than the unit values of radios and TV's imported into Japan. The actual level of protection, though, is probably much less than this because Japanese radios and TV's are generally of much higher quality than those that the Japanese import. Sazanami et al recognize that this is a problem with their data, yet they still report an estimate of 600% in their main table.

A NEW APPROACH

We propose a fourth approach. It is similar to that used by Roningen and Yeats in that we rely on retail prices. With so many possible barriers to trade, it seems that the only way to account for all of them is to exploit the information which prices concisely convey. If there are no trade barriers, then equivalent goods in different countries should not sell at prices that differ by more than the amount it costs to move the goods from one country to the other. If excessive gaps in price exist for equivalent goods in two different markets, then we can conclude that barriers fragment those markets. Moreover, we can use the gap in price (again, adjusted for unavoidable transport costs) as a measure of the extent of protection. Thus, a

[1] There have been other attempts to measure protection not discussed here because these other methods can only be applied to certain sectors of the economy. See C.F. Bergsten, K.A. Elliott, J.J. Schott, and W.E. Takacs 1987 (textiles and apparel), B. Papillon 1994 (cheese), and D.G. Raboy and T. Simpson 1992 (peanuts).

single number, a price gap, if measured correctly, can tell us the total effect of all possible barriers to integration. We believe that Sazanami et al had the right idea but that they did not implement it properly because they used unit value and thus were not able to compare equivalent goods. Not comparing equivalent goods undermines this method.

Our method exploits data on carefully matched retail prices that the OECD collects in order to calculate PPP estimates. With the cooperation of member governments, OECD researchers regularly collect prices on over 3000 final goods. The researchers make every effort to ensure that products of the same quality are compared across countries. For most manufactured goods, the same make and model are compared, or comparisons are made from a list of two or more makes and models when it is thought that each item on that list is equivalent. For other manufactured goods and food items, researchers rely on an exact description of the items to be priced. When it is difficult to find appropriate matches based on model or on descriptions, researchers from the countries involved travel to the other countries in order to examine which items would be the most appropriate matches for the items in their country. The researchers have also called upon the expertise of buyers for large stores, manufacturers, and trade associations in order to determine matches.

Prices are collected from many markets and outlets at different times during the year in order to obtain a single annual, national average (World Bank 1993, p10). Also, prices of the average-sized purchase for that country are compared. After collecting the data, apparent mismatches in quality are dealt with either by refining the specifications or discarding the data (OECD 1995, p5). This method does not completely resolve the problem of comparing items of different qualities, but the scale of resources expended on accurate matching indicates that these are excellent measures of price differences for equivalent products.

Prices are collected at the level of the “basic heading”. A basic heading cannot be too broad or too narrow. It cannot be so broad that very different products are compared. It can’t be so narrow that each product is only purchased in one or two countries. For instance, seaweed is too narrow, and food is too broad. To be included in the survey, each product must be accepted for pricing by at least one other country. Thus, not every product is priced in each country. But, as long as countries price their own nominated products and a share of all other products nominated, relative prices for each product and country can be calculated indirectly as well as directly. (See Eurostat-OECD PPP Programme 1996.) There are about 200 basic headings. We obtained basic heading price data from the 1993 survey and trimmed the sample to about 120 traded goods.

These are consumer prices, not the producer prices that one needs to measure how much an industry is insulated from world markets.[2] We have, however, been able to convert these consumer prices to producer prices using data on margins: wholesale trade, retail trade, transportation, taxes, subsidies.[3] We found such margins data for six countries—Australia, Canada, Japan, the Netherlands, the UK, and the US—and these are the six countris in our sample. All of the margins data comes from 1990, except the US’s, which is from 1987, the

[2] The MITI-US Department of Commerce retail price survey (MITI 1992) has been used by some as evidence of protection in Japan. But retail prices do not reflect protection for producers to the extent that domestic trade margins differ by country. Since we find that margins can vary widely, we reject a simple comparison of retail prices as providing reliable information on protection. Also, the products were chosen through political negotiations. Thus, the final list is not random and does not reflect scientific sampling techniques. Nevertheless, see Yager 1991 and Noland 1995 for interesting analyses of the results.

[3] Roningen and Yeats 1976 also use retail prices and adjust for taxes and transport costs, but they do not adjust for wholesale and retail trade margins, which we find to significantly outweigh taxes and transportation.

latest year available. We matched these margins with the OECD retail price data and then produced estimates of producer prices by peeling off the relevant margins. Thus,

$$p_{ij}^{p} = \frac{p_{ij}^{c}}{1+m_{ij}},$$

p_{ij}^{p}: the producer price of good *i* in country *j*,
p_{ij}^{c}: the consumer price of good *i* in country *j*, as taken from the OECD data,
m_{ij}: the margin for good *i* in country *j*, as taken from the national IO table.

Such producer prices shed light on which industries in which countries are most efficient. But inferring the extent of insulation from foreign competition requires one more step: taking account of transport costs from one nation's market to another. A foreign good must travel from the foreign factory to the foreign border and then to the domestic border in order to compete with a domestic good.[4] Thus, one cannot infer protection simply by comparing producer prices. The domestic producer price must be compared to the landed price of the foreign good. So, we infer the import price by using data on export margins, also available from national input-output tables, and international transport costs. We have export margins for all countries except the UK, for which we used the Netherlands export margins. Export margins tend not to vary much by country, so we feel confident that using the Netherlands margins does not compromise our results.

Only Australia and the US have detailed data on international transport costs. Each of these countries reports import values for detailed commodities on both a cif and fob basis. The cif/fob ratio is a good measure of all the costs of shipping goods from abroad to these countries. Australia probably has the highest international transport costs in our sample, and the US and Canada, the lowest, since they trade so much with each other. Thus, the costs for Australia and the US represent reasonable bounds on the costs for the other four. It turns out that Australia has the higher cif/fob ratio, as one would expect. The ratios for both countries, however, are small, so that the gap between the two is also small. The average for all products for the US is 1.05, while the overall average for Australia it is 1.09. Thus, for each basic heading we take the average of the two cif/fob ratios and use this as an estimate for the international transport cost for that product for all the countries.

We use this data on export margins and international transport costs to compute landed prices for each product and country, as follows. By adding the export margins to the producer prices, we calculated the export price for each product in each country. The lowest export price plus the common international transport cost is the landed price. Thus, the export price is given by:

$$p_{ij}^{e} = p_{ij}^{p}(1+em_{ij}),$$

p_{ij}^{e}: the export price of good *i* for country *j*,
em_{ij}: the export margin of good *i* for country *j*.

The landed price is then given by:

[4] For a discussion of the importance of export margins, see Rousslang and To 1993. They erroneously state, however, that export margins are only available for the United States.

$$p_{ij}^{\ell} = p_{iM}(1 + t_i),$$

p_{ij}^{P}: the landed price of good *i* into country *j*,
t_I: the international transport margin for good *i*,
$p_{iM} = min(p_{1j}^{e}, p_{2j}^{e}, \ldots, p_{6j}^{e})$, the minimum of the 6 export prices.

The ratio of the producer price to the common landed price measures the amount of protection. Note that a country can have a producer price that is higher than the lowest producer price in the sample and still have 0 protection, because of the unavoidable costs of shipping goods between nations.

In the final data, we combined these ratios with tariff data. If the ratio that we calculated was less than one plus the tariff rate, then we took the latter to be an accurate measure of protection. In such a case, our method did not find evidence of protection beyond tariffs. Thus, the measure of protection is:

$$pr_{ij} = max(\frac{p_{ij}^{p}}{p_{ij}^{l}}, 1 + tar_{ij}).$$

If the underlying OECD price data does not fully account for quality differences, these measures may overstate the amount of protection. On the other hand, these measures will understate the true amount of protection if each of the 6 countries has substantial barriers to imports for that good. For such goods, the calculated landed price will be higher than the true world price to the extent that the low cost producer has barriers against imports. This may be true of textiles, for instance. In practice, though, with such free traders as the US, Canada, and Australia in our sample, this bias will be rare. If just one of the countries has little or no barriers to imports in that good, then our measures will not be biased downward.

In summary, we believe that these measures are an improvement over previous ones because they are trustworthy, comprehensive, and internationally comparable. Until now, researchers have recognized prices as perhaps the most promising tool for assessing protection, but differences in quality have bedeviled attempts to use prices, except for certain homogeneous goods, such as agricultural products. The data here, because they have resulted from intensive multilateral efforts to correct for quality differences, have earned our trust as accurate measures of true price gaps. In addition, they are comprehensive, covering all traded final goods. Previous studies have tended to limit their coverage to sectors in which protection had been previously thought to exist, without testing whether other sectors might enjoy well-disguised insulation from foreign competition. Finally, many other estimates have only been derived for a single country at a time, making it most difficult to rank countries in terms of openness. Our measures use the same data and apply the same method to each country in the sample, thus allowing us to make such rankings, for individual products, for aggregated categories, and for each country as a whole.

The margins data used in deriving the protection data sheds light on the distribution sectors in these countries. We find that margins differ widely across countries, indicating that high margins in some countries are imposing significant costs. We use our margins data to estimate the welfare losses associated with flabby domestic distribution, on top of losses due to protection, as explained below.

THE EXTENT OF PROTECTION

Table 1 presents the protection data. We have aggregated up to 28 sectors: agriculture/fisheries/forestry plus 27 manufacturing sectors. These correspond to ISIC Revision 2, and the respective code numbers are listed. There are 36 ISIC2 sectors, but seven of them contain only intermediate goods and thus are not a part of our sample. An eighth sector, other transport, was excluded because of missing price data.

Overall, we see that Australia, Canada, and the US are the most open. Their producer prices are 11 to 15% higher than they would be if these six markets were fully integrated. The Netherlands and the UK, on the other hand, face average protection rates of 47% and 51%, respectively. Japan's markets appear to be the most insulated from foreign competition, with a 70% premium. It is interesting to note that Japan shows no evidence of protection in automobiles. These numbers appear to support the claim that auto imports into Japan are low because they produce superior cars, not because of hidden barriers.

It is instructive to break these numbers down into 2 broad categories: food and nonfood. Food includes raw agricultural products and processed food products (codes 1000, 3110/3120, 3130, and 3140), while nonfood includes all other manufactured products. Table 2 implies that Australia's food industry is very well integrated with world markets, while its manufacturing it more isolated than that of Canada and the US. Japan, the Netherlands, and the UK all show considerable fragmentation in nonfood manufacturing, ranging from 51 to 57%. The food estimates, though, reveal why Japan appears to be the least integrated of the 6. Its food prices are more than two times what they would be if the government were to allow integration of these markets with other major economies.

In general, these numbers reveal significant barriers. Australia, Canada, and the US are probably three of the world's most open economies. Yet, as a result of not being fully integrated with the other five economies, they allow producers of tradeables to be 10-15% less efficient than the top foreign competitor in the group. Japan, the Netherlands, and the UK protect their producers so much that they have slack in the 50 to 70% range. If these numbers seem high, it is possible that not fully correcting for quality differences could bias these numbers upward, since consumption bundles within each of the categories vary somewhat across country. On the other hand, including only six countries would tend to bias these estimates downward.

THE PREVALENCE OF SLUGGISH DISTRIBUTION

Table 3 reports the ad valorem margins, $\boldsymbol{1 + m_{ij}}$, for each of the 28 categories. These were the margins used to convert the consumer prices to producer prices. It appears that the UK has the lowest margins, Australia and Canada have the highest, while Japan, the Netherlands, and the US are in the middle. Other studies have compared ad valorem distribution margins and have concluded that Japan's average margin roughly equals the US's, and, in fact, our numbers seem to imply that the average Japanese margin is less. It is misleading, however, to compare ad valorem distribution margins, since these are percentages of the underlying producer prices. If a country's producer prices are unusually high, then the ad valorem distribution margin will be lower than if the producer prices were not abnormal. In order to compare accurately the actual costs of distribution, we need to look at the specific or absolute margins across countries, ie, how much it costs to move **each unit** of the good from the factory to the store shelf, instead of how much it costs for each dollar of output. The cost per unit is the true measure of efficiency.

We can use our producer price and margins data to calculate for the first time, to our knowledge, specific distribution margins for several countries. The ad valorem margin is the ratio of the consumer price to the producer price, while the specific margin is the difference. So,

$$m_{ij}^{s} = p_{ij}^{c} - p_{ij}^{p} = p_{ij}^{p}(1 + m_{ij}) - p_{ij}^{p} = p_{ij}^{p} m_{ij},$$

m_{ij}^{s}: the specific margin for good *ii* in country *j*,
p_{ij}^{c}: the consumer price for good *ii* in country *j*.

This specific margin tells how many cents it costs to move one dollar's worth of the good, valued in the landed price, from the factory to the shelf. For instance, a 25% ad valorem margin applied to a producer price which is twice the landed price implies that 50 cents is spent on distribution for each dollar (in landed prices) of output. The same ad valorem margin applied to a producer price which equals the landed price, on the other hand (indicating no protection), will show that 25 cents is spent on distribution for each landed price dollar. We assume that margins are the same for imported and domestically produced goods.

Table 4 shows the specific margins for our sample. The United Kingdom still has the lowest margins in specific terms, but the US specific margins are quite close. The estimates for the other four countries are tightly bunched in the 42-49% range. Now, we see that Japan's margins are not lower than the US's, but are instead greater by about a third. Also, Australia and Canada's margins are not as high as they appeared to be. Thus, correcting ad valorem margins for underlying producer prices tells a substantially different story concerning the costs of distribution in these countries.

These measures also indicate how efficient each country's distribution system is, if we assume that the quality of distribution and the cost of inputs into distribution do not vary significantly across these countries. Unlike the goods prices, the margins data are not corrected for quality differences. So, if we think that the US, with its clean, comfortable stores with wide selection, has higher quality distribution, then the costs for the US are biased upward. On the other hand, stores in the US are spread out more than they are in Japan, for instance, so that the US household incurs a greater cost in getting there, which reduces the quality of the retail distribution. Now, the American consumer tends to cut travel costs by buying more with each visit, but this may not make up for the less compact distribution of stores, since buying more per visit means that the household has to incur more storage costs. Without reliable data on the quality of distribution, it is difficult to say how these estimates may be biased as indicators of overall efficiency.

WELFARE FRAMEWORK

We use the AGE framework of Harrison, Rutherford, and Tarr (HRT)[5]. They used this model in order to assess the effects of the Uruguay Round. These results are outlined in their 1997 *Economic Journal* article. This article, as well as the two other pieces, describe the model in some detail. We point out the highlights here but refer the reader to those articles for more information. The strengths of this model are that it has more country and sectoral detail than most AGE models and that it allows for both increasing returns to scale and dynamic adjustment of the capital stock.

[5] The model is based on the computer code provided by Glenn Harrison, Thomas F. Rutherford and David Tarr. Their code is available for public access on web site http://theweb.badm.sc.edu/glenn/ur_pub.htm, and was employed in their evaluation of the Uruguay Round in Harrison, Rutherford and Tarr [1995][1996][1997].

The model encompasses 24 regions and 22 sectors. (See Table 5.) The underlying data come from the GTAP database, version 2. While this is a bit dated, our protection and margins data are from 1993, so that the two sets of data come from the same time frame. Production uses three factors—labor, capital, and land—and intermediate goods. Value added has a CES production function, while the production function for intermediates and the value added composite is Leontief. (As part of sensitivity analysis, we relaxed the Leontief assumption with little impact on the results.)

Each region has a representative consumer and a single government agent, both of whom have a nested CES utility function. Demand across the Armington composite for each of the 22 goods is Cobb-Douglas. Demand across import varieties from the 23 other regions is CES, as is demand across the import composite and domestic goods. Some sectors are assumed to have constant returns to scale. Other sectors, though, are modeled with increasing returns to scale and imperfect competition. In these sectors, there is firm-level product differentiation. Firms have fixed costs and constant marginal costs, meaning that fewer firms leads to rationalization gains. These firms compete in a quantity-adjusting oligopoly framework, with entry and exit that drive profits to 0. Thus, for these IRTS sectors, the output is a composite of varieties. Consumers have preferences for variety, and these preferences may be biased toward home varieties.

Dynamics are incorporated by allowing the capital stock to vary in response to the increased rate of return caused by liberalization. Investment increases the capital stock until its return is driven back down to the long-run equilibrium. The model ignores the consumption foregone by the increased investment, so that the gains from it may be overestimated. On the other hand, the model also ignores any impact of growth on productivity and innovation, which might lead to an underestimate of the gains.

Incorporating Our Data into the Model

Incorporating the protection data into the model is straightforward. We simply replaced the tariff equivalents used by HRT with our own. Their tariff data is a combination of GTAP data and additional data from the World Bank.

Incorporating the margins data was trickier. The GTAP model and data do not account directly for distribution margins. In the GTAP framework, all distribution services are included in the trade and transport sector instead of being included in the sectors in which those distribution services are actually used. To best model the impact of margins reduction, though, we need to incorporate margins explicitly into each sector. This is done by realizing that margins are just like taxes. They insert a wedge between consumer and producer prices. Since, in this model, tax revenue is treated the same as income to private agents, treating margins as taxes is justified. For the three countries involved, therefore, we used our data on margins in order to insert "taxes" corresponding to those margins into each of the final goods sectors. We also zeroed out trade and transport services supplied to final demand for each of these countries. In effect, we transformed trade and transport services from a final good into a tax. After these data changes, the model was recalibrated.

THE TRADE SIMULATIONS

We estimate the effects of trade barriers by simulating what would happen to the world economy if these barriers were zeroed out. While we have protection data for six countries, the model does not break out EU countries separately, so we are not able to include the UK or the Netherlands in our simulations. For this paper, we also leave out Canada. So, we simulate the effects of trade barriers in Australia, Japan, and the United States. For each country we perform two simulations: the removal of all protection throughout the economy and the removal of protection on final goods only. Since our protection data covers only final goods, these latter simulations focus on the welfare effects implied by our data alone. We also simulate the removal of barriers in all three countries simultaneously.

We focus only on aggregate impacts on GDP, saving an examination of sector and factor impacts for future work. For each simulation, we report a base case and low elasticity case. The former uses the same elasticities as HRT used in their Economic Journal article. In particular, the elasticity of substitution among import varieties, σ_{MM}, is 8, and the elasticity of substitution between imports and domestic goods, σ_{DM}, is 4. An examination of changes in all the elasticities shows that these two parameters are the most important. Higher values of these parameters lead to greater substitution in response to price reductions and, in general, higher welfare. As a rough lower bound on the estimated changes, we report the effects when $\sigma_{MM} = 4$ and $\sigma_{DM} = 2$. This is the low elasticity case. As HRT point out, since this model encompasses a long run steady state, we expect these elasticities to be high, rather than low.

RESULTS

We report the welfare effects of all trade barriers in Table 6, and the effects of barriers in just final goods in Table 7. All in all, the numbers in Table 6 are quite large. When one measures trade barriers more comprehensively, one finds significant costs from economic isolation. In particular, if Japan were to remove all its barriers, not only would this boost Japan's GDP by about 2% per year, but it would also increase world GDP by about 1% each year. This effect is at least as great as that of the entire Uruguay Round on world GDP, as reported by HRT (0.8%). Liberalization in Japan would especially help developing countries, boosting their overall GDP by 1.6% in the base case. Again, this is similar to the impact of the Uruguay Round on LDCs (1.4%). Put the other way, Japan's barriers harm itself, but they also impose significant harm on the rest of the world, especially LDCs. It appears that Australia has the most to gain among the three considered. Even the low elasticity case shows gains to Australia in excess of 3%. The results for Australia, though, should be viewed with caution, since they do vary quite a bit as the elasticities are changed. Even though the US is quite open to trade, complete opening there would increase its GDP by about 0.7% per year. If all three countries were to liberalize simultaneously, the gain to world welfare would be more than twice that of the Uruguay Round.

The results from the simulation of just final goods liberalization tell a similar story. Interestingly, the US appears to gain more from just final goods opening, as opposed to removing all barriers. One possible reason for this is that barriers to intermediate goods in the US may not be too far from the optimal tariff.

Of course, complete liberalization in any of these countries is not a policy option right now. These results show, however, that the potential gains from future attempts to liberalize trade, especially non-tariff barriers, remain quite large, despite decades of liberalization.

THE MARGINS SIMULATIONS

We conducted the margin reduction experiments by assuming that all specific margins converged to the lowest of the six specific margins for that industry. (To determine minimum margins, we looked at 6 countries in the original sample, not just the 3 in our simulations.) We thus assumed that any margin higher than the minimum in our sample is needlessly inflated, due to protection from domestic or international competitors. In effect, we posit that distribution can theoretically be traded like other services, and that liberalizing distribution should lead to a convergence in prices. If however, non-traded inputs, such as land, prevent such a convergence in distribution costs, then our experiments may overstate the costs of high margins. On the other hand, with only 6 countries in our sample, the low margin country may not have an efficient margin, and our simulations would understate the gains from streamlining this sector. Also, in modeling the margins as taxes, we have implicitly assumed that the full value of revenue to distributors is part of GDP. If domestic distributors, though, charge high margins simply because they are inefficient relative to what foreign suppliers could do (and foreign suppliers are kept out), these revenues to distributors may actually include substantial deadweight loss. In this case as well, our simulations understate the costs of high margins. We stress that in no case did we reduce margins to 0. All final goods require a positive distribution margin, and removing such a margin entirely would be inappropriate. Reducing the margin to the minimum value in many cases leaves a substantial margin in place.

We report the margins results in Table 8. In Australia, high margins appear to impose lower costs on society than do trade barriers. For the US, and especially for Japan, the costs from high margins exceed the costs of trade barriers. Part of the explanation for the US result stems from the fact that trade barriers in the US are quite low. The results for Japan are striking. Sluggish distribution there appears to shrink GDP by about 4%. This is quite a large number yet not implausible, when one considers the various regulations in Japan's distribution sector: limitations on large retailers, zoning laws that restrict entry, restrictions on store hours, etc. Overall, the costs of high margins rival those of trade barriers. The impact of high margins in on other countries, though, is less than that of trade barriers.

IMPLICATIONS

The above simulations and analysis have produced the following clear implication: Japan has burdened its final goods and distribution sectors with heavy regulations that impose unusually large economic costs.

One of the most frustrating economic problems of the 1990s has been the persistent sluggishness of the Japanese economy. Much has been written about the causes of the slump, and many proposals for fixing it have been proffered. A complete analysis of the problem lies outside the scope of this paper. The results here, though, do shed light on what is probably a key piece of the ultimate solution to Japan's woes, which are, to a large degree, the world's woes. The message could be expressed thus: deregulate, deregulate, deregulate. For various reasons, the Japanese government has, over the years, intervened in numerous ways in many markets to prop up prices. This study confirms the results of others that many of these prices are way out of line. While increased government spending may produces short-term gains, the record in Japan and basic economic theory imply that such stimulus alone will not solve the Japanese economic problem. For healthy growth to return, the Japanese must deregulate their markets so that large deadweight losses can be erased. The resulting increases in income will be true gains, not the borrowed ones that result from artificial government spending of other people's money, and will be large gains, increasing GDP by a few percent or more. Perhaps more importantly, in the longer run, Japan's resources will be reallocated to sectors in which it has a comparative advantage, thereby stimulating a permanently more robust economic performance. Widespread and immediate liberalization is politically impossible at this point, but an increasing number of Japanese experts have been calling for liberalization in recent years. It appears to us that such calls are on target and need, ultimately, to be heeded.

A second key implication of this study is that high margins greatly affect welfare, perhaps as much or more than trade barriers. Thus, inflated margins impose large welfare costs, just as trade barriers do, and perhaps concern for protection should also automatically trigger concern for high margins.

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TABLE 1: PROTECTION ESTIMATES

FRAGMENTATION	Australia	Canada	Japan	Netherlands	UK	US
1000 Agriculture, Fisheries, and Forestry	1.019	1.154	1.856	1.017	1.741	1.086
3110 Processed Food	1.031	1.204	2.474	1.268	1.344	1.088
3130 Beverages	1.023	1.156	2.038	1.556	1.412	1.095
3140 Tobacco	1.000	1.106	1.137	2.165	1.117	1.476
3210 Textile	1.089	1.089	1.660	1.038	1.501	1.000
3220 Apparel	1.095	1.021	1.340	1.015	1.115	1.018
3230 Leather and Products	2.480	1.000	1.648	1.223	1.448	1.000
3240 Footwear	1.592	1.322	2.323	1.814	1.115	1.000
3320 Furniture and fixtures	1.553	1.425	2.865	1.267	2.174	1.000
3410 Paper and Products	1.365	1.000	2.332	1.990	2.618	1.000
3420 Printing and Publishing	1.077	1.185	1.307	1.192	1.058	1.000
3522 Drugs and Medicines	1.000	2.752	1.237	3.476	2.421	3.162
3529 Chemical Products	1.077	1.000	1.903	1.015	1.301	1.027
3540 Petroleum and Coal Products	1.257	1.000	2.297	3.097	3.001	1.000
3550 Rubber Products	1.681	1.000	4.660	3.064	3.182	1.717
3610 Pottery, China, etc	1.597	1.000	2.861	1.000	1.491	1.000
3810 Metal Products	1.397	1.095	2.085	1.620	1.563	1.167
3825 Office and Computing Machinery	1.141	1.000	1.145	2.106	1.655	1.000
3829 Machinery and Equipment, nec	1.497	1.215	1.627	1.557	1.394	1.165
3832 Radio, TV, and Communication Equipment	1.049	1.039	1.319	1.454	1.335	1.014
3839 Electrical Apparatus, nec	1.369	1.149	2.117	1.523	1.551	1.071
3841 Shipbuilding and Repairing	1.283	1.064	1.243	1.607	1.594	1.000
3842 Railroad Equipment	1.324	1.004	1.183	1.469	1.453	1.000
3843 Motor Vehicles	1.006	1.132	1.000	1.527	1.566	1.091
3844 Motorcyles and Bicycles	1.000	1.158	1.000	1.261	1.887	1.000
3845 Aircraft	1.284	1.051	1.092	1.551	1.526	1.000
3849 Transport Equipment, nec	1.155	1.000	1.352	1.969	1.810	1.000
3850 Professional Goods	1.047	1.007	1.279	1.221	1.832	1.102
3900 Other Manufacturing, nec	1.200	1.098	2.753	1.512	1.774	1.066
WEIGHTED GEOMETRIC MEAN	**1.151**	**1.139**	**1.703**	**1.467**	**1.506**	**1.112**

TABLE 2: FOOD VS. NON-FOOD PROTECTION

	Australia	Canada	Japan	Netherlands	UK	US
Food	1.024	1.174	2.176	1.344	1.351	1.124
Nonfood	1.208	1.126	1.513	1.509	1.574	1.109

TABLE 3
AD VALOREM MARGINS

TABLE 3	MARGINS	Australia	Canada	Japan	Netherlands	UK	US
1000	Agriculture, Fisheries, and Forestry	1.608	1.596	1.612	2.009	1.222	1.951
3110	Processed Food	1.613	1.492	1.522	1.569	1.335	1.466
3130	Beverages	2.698	2.974	1.405	1.494	1.619	1.736
3140	Tobacco	4.539	5.489	1.384	1.457	1.285	1.664
3210	Textile	1.876	1.762	1.813	2.284	1.583	1.797
3220	Apparel	1.960	1.920	2.121	2.517	1.610	1.864
3230	Leather and Products	2.395	1.654	1.680	2.286	1.611	1.865
3240	Footwear	2.020	1.808	1.849	1.418	1.600	2.122
3320	Furniture and fixtures	1.893	1.804	1.818	2.070	1.411	1.905
3410	Paper and Products	2.575	2.032	1.678	2.059	1.616	2.582
3420	Printing and Publishing	2.023	1.238	1.818	1.647	1.405	1.523
3522	Drugs and Medicines	3.951	2.292	2.097	1.470	1.418	1.700
3529	Chemical Products	2.258	2.028	1.608	2.315	1.569	1.718
3540	Petroleum and Coal Products	1.881	2.737	1.813	1.367	1.384	1.561
3550	Rubber Products	1.881	4.851	1.984	1.574	1.384	2.098
3610	Pottery, China, etc	2.943	2.105	1.490	2.556	1.628	2.166
3810	Metal Products	1.383	1.613	1.200	1.485	1.243	1.422
3825	Office and Computing Machinery	1.469	1.380	1.198	1.091	1.091	1.252
3829	Machinery and Equipment, nec	1.298	1.281	1.207	1.069	1.056	1.265
3832	Radio, TV, and Communication Equipment	1.932	1.575	1.213	1.416	1.189	1.303
3839	Electrical Apparatus, nec	1.657	1.742	1.352	1.361	1.440	1.534
3841	Shipbuilding and Repairing	1.030	1.122	1.029	1.000	1.000	1.101
3842	Railroad Equipment	1.003	1.142	1.041	1.057	1.057	1.038
3843	Motor Vehicles	1.772	1.351	1.443	1.304	1.308	1.228
3844	Motorcyles and Bicycles	1.881	1.719	1.656	2.077	1.384	2.314
3845	Aircraft	1.011	1.201	1.158	1.013	1.013	1.063
3849	Transport Equipment, nec	1.518	1.719	1.199	1.057	1.057	1.654
3850	Professional Goods	2.287	2.117	1.483	1.943	1.427	1.799
3900	Other Manufacturing, nec	2.330	2.074	1.792	2.073	1.463	1.980
	GEOMETRIC WEIGHTED MEAN	**1.423**	**1.410**	**1.248**	**1.294**	**1.189**	**1.292**

TABLE 4: SPECIFIC MARGINS

		Australia	Canada	Japan	Netherlands	UK	US
1000	**Agriculture, Fisheries, and Forestry**	0.620	0.688	1.136	1.026	0.387	1.033
3110	**Processed Food**	0.632	0.592	1.292	0.721	0.450	0.507
3130	**Beverages**	1.738	2.282	0.824	0.769	0.874	0.806
3140	**Tobacco**	3.539	4.967	0.436	0.991	0.319	0.980
3210	**Textile**	0.955	0.830	1.350	1.332	0.875	0.797
3220	**Apparel**	1.051	0.940	1.502	1.540	0.680	0.879
3230	**Leather and Products**	3.459	0.654	1.121	1.573	0.885	0.865
3240	**Footwear**	1.623	1.068	1.971	0.758	0.668	1.122
3320	**Furniture and fixtures**	1.386	1.145	2.342	1.355	0.894	0.905
3410	**Paper and Products**	2.149	1.032	1.582	2.107	1.614	1.582
3420	**Printing and Publishing**	1.102	0.282	1.070	0.771	0.428	0.523
3522	**Drugs and Medicines**	2.951	3.557	1.356	1.634	1.013	2.213
3529	**Chemical Products**	1.355	1.028	1.157	1.334	0.740	0.737
3540	**Petroleum and Coal Products**	1.107	1.737	1.866	1.137	1.153	0.561
3550	**Rubber Products**	1.480	3.851	4.583	1.757	1.223	1.885
3610	**Pottery, China, etc**	3.103	1.105	1.402	1.556	0.937	1.166
3810	**Metal Products**	0.535	0.672	0.416	0.785	0.379	0.493
3825	**Office and Computing Machinery**	0.535	0.380	0.226	0.192	0.151	0.252
3829	**Machinery and Equipment, nec**	0.445	0.342	0.336	0.107	0.078	0.309
3832	**Radio, TV, and Communication Equipment**	0.977	0.597	0.280	0.604	0.252	0.307
3839	**Electrical Apparatus, nec**	0.900	0.853	0.745	0.551	0.683	0.573
3841	**Shipbuilding and Repairing**	0.038	0.130	0.036	0.000	0.000	0.101
3842	**Railroad Equipment**	0.004	0.142	0.048	0.083	0.082	0.038
3843	**Motor Vehicles**	0.777	0.398	0.443	0.464	0.482	0.249
3844	**Motorcyles and Bicycles**	0.881	0.833	0.656	1.358	0.725	1.314
3845	**Aircraft**	0.014	0.212	0.173	0.021	0.021	0.063
3849	**Transport Equipment, nec**	0.598	0.719	0.268	0.112	0.103	0.654
3850	**Professional Goods**	1.348	1.125	0.618	1.152	0.782	0.881
3900	**Other Manufacturing, nec**	1.596	1.178	2.181	1.623	0.822	1.045
	OVERALL SPECIFIC MARGINS	**0.486**	**0.466**	**0.423**	**0.431**	**0.284**	**0.325**

TABLE 5

22 SECTORS	24 REGIONS	
Paddy rice	AUS	Australia
Wheat	NZL	New Zealand
Grains (other than rice and wheat)	CAN	Canada
Non-grain crops	USA	United States
Forestry-fishing-lumber-wood-paper-wool	JPN	Japan
Processed rice	KOR	South Korea
Milk products	E_U	E.E.C. - 12
Textiles	IDN	Indonesia
Wearing apparel	MYS	Malaysia
Chemicals - rubber - plastics	PHL	Philippines
Primary iron and steel	SGP	Singapore
Non-ferrous metals	THA	Thailand
Fabricated metal	CHN	China
Transport industry	HKG	Hong Kong
Trade and transport	TWN	Taiwan
Investment good	ARG	Argentina
Meat products and livestock	BRA	Brazil
Energy and energy products	MEX	Mexico
Minerals and mineral products	LAM	Rest of Latin America
Food - beverages - tobacco	SSA	Sub-Saharan Africa
Machinery - equipment - other manufacturing	MNA	Middle East and North Africa
Services and utilities	EIT	Easter Europe and Former Soviet Union
	SAS	South Asia
	EFTA	Other European (EFTA - Switzerland - Turkey - SA)

TABLE 6: ALL TRADE BARRIERS (% change in GDP)

	AUSTRALIA		JAPAN		US		ALL COUNTRIES	
	BASE	**LOW**	**BASE**	**LOW**	**BASE**	**LOW**	**BASE**	**LOW**
AUS	**9.59**	3.63	**2.46**	2.25	**0.63**	0.64	**12**	6.09
NZL	**-0.66**	-0.28	**2.45**	2.12	**0.77**	0.76	**3.08**	2.85
CAN	**0.13**	0.44	**3.52**	1.41	**-1.12**	-0.96	**9.93**	3.62
USA	**0.25**	0.18	**0.94**	0.81	**0.69**	0.45	**1.29**	0.87
JPN	**-0.17**	0.02	**2.19**	1.36	**0.2**	0.15	**2.84**	2.06
KOR	**1.16**	0.46	**2.13**	1.51	**1.15**	0.77	**4.76**	2.97
E_U	**-0.04**	-0.08	**0.09**	0.13	**0.11**	0.12	**0.42**	0.42
IDN	**-0.21**	0.2	**1.74**	1.24	**0.78**	0.73	**2.61**	2.33
MYS	**-0.24**	0.84	**5.6**	2.9	**0.57**	0.58	**6.08**	4.29
PHL	**0.26**	0.13	**1.83**	2.02	**1.07**	0.96	**3.57**	3.33
SGP	**0.35**	-0.76	**23.15**	5.06	**-0.15**	-0.08	**23.32**	4.67
THA	**0.4**	-0.24	**10.16**	6.06	**1.16**	0.75	**11.8**	6.76
CHN	**-0.11**	0.43	**1.08**	0.78	**1.31**	0.94	**2.85**	2.54
HKG	**1.33**	-1.79	**1.27**	1.79	**-0.21**	-0.25	**1.98**	-0.27
TWN	**-0.25**	0.61	**7.79**	4.36	**1.2**	1.08	**9.39**	6.61
ARG	**0.01**	-0.07	**0.41**	0.37	**0.23**	0.2	**0.67**	0.52
BRA	**-0.21**	-0.04	**7.88E-03**	-8.78E-03	**0.41**	0.35	**0.64**	0.67
MEX	**0.08**	-0.14	**0.91**	0.6	**2.41**	2.54	**4.5**	3.67
LAM	**0.19**	-0.22	**1.81**	1.59	**1.55**	1.34	**3.24**	2.53
SSA	**-2.77E-03**	-0.21	**0.83**	0.8	**-0.32**	-0.2	**0.08**	0.19
MNA	**-0.19**	-0.17	**1.04**	0.78	**0.45**	0.33	**0.88**	0.66
EIT	**-0.04**	-0.1	**0.01**	-1.36E-03	**-0.03**	-0.04	**0.03**	-7.33E-04
SAS	**0.28**	0.09	**0.58**	0.43	**0.4**	0.24	**0.95**	0.61
EFTA	**-2.29E-03**	0.06	**0.12**	0.15	**0.11**	0.12	**0.24**	0.25
LDC	**0.09**	-8.37E-03	**1.62**	1.01	**0.71**	0.6	**2.56**	1.74
DEV	**0.18**	0.1	**0.98**	0.7	**0.28**	0.2	**1.71**	1.12
WLD	**0.16**	0.08	**1.11**	0.76	**0.37**	0.29	**1.89**	1.25

BASE refers to base case elasticities: SIGMAMM = 8 and SIGMADM = 4.
LOW refers to low elasticities: SIGMAMM = 4 and SIGMADM = 2.

TABLE 7: FINAL GOODS ONLY (% change in GDP)

	AUSTRALIA		JAPAN		US		ALL COUNTRIES	
	BASE	**LOW**	**BASE**	**LOW**	**BASE**	**LOW**	**BASE**	**LOW**
AUS	9.51	3.6	2.62	2.31	0.63	0.63	12.07	6.11
NZL	-0.65	-0.26	2.61	2.19	0.76	0.75	3.23	2.91
CAN	0.14	0.44	4.1	1.47	-1.09	-0.93	10.62	3.7
USA	0.25	0.18	1.01	0.81	0.68	0.45	1.34	0.87
JPN	-0.17	0.01	0.72	0.23	0.2	0.14	1.39	0.93
KOR	1.16	0.45	2.24	1.53	1.14	0.76	4.84	2.97
E_U	-0.04	-0.08	0.12	0.14	0.11	0.12	0.43	0.42
IDN	-0.22	0.19	1.88	1.26	0.78	0.73	2.73	2.33
MYS	-0.25	0.82	6.52	3.07	0.56	0.58	6.92	4.44
PHL	0.25	0.12	1.98	2.07	1.05	0.94	3.68	3.35
SGP	0.34	-0.75	26.23	5.4	-0.15	-0.08	26.26	5.02
THA	0.39	-0.24	10.46	6.22	1.15	0.74	12.06	6.89
CHN	-0.11	0.42	1.15	0.8	1.29	0.92	2.9	2.54
HKG	1.32	-1.76	1.19	1.73	-0.21	-0.25	1.89	-0.28
TWN	-0.26	0.59	8.64	4.6	1.17	1.05	10.16	6.79
ARG	0.01	-0.07	0.46	0.35	0.22	0.19	0.71	0.5
BRA	-0.21	-0.04	0.02	2.00E-04	0.4	0.33	0.64	0.67
MEX	0.08	-0.14	0.98	0.61	2.35	2.48	4.51	3.63
LAM	0.19	-0.22	1.93	1.59	1.55	1.34	3.36	2.54
SSA	1.65E-04	-0.2	0.88	0.77	-0.3	-0.18	0.15	0.19
MNA	-0.18	-0.16	1.09	0.77	0.46	0.34	0.94	0.67
EIT	-0.04	-0.1	9.75E-03	9.00E-03	-0.03	-0.05	0.03	-8.82E-03
SAS	0.28	0.09	0.6	0.43	0.4	0.25	0.97	0.61
EFTA	-1.73E-03	0.06	0.14	0.15	0.11	0.12	0.25	0.25
LDC	0.08	-8.29E-03	1.75	1.03	0.7	0.59	2.67	1.75
DEV	0.18	0.1	0.69	0.44	0.27	0.2	1.43	0.86
WLD	0.16	0.08	0.91	0.57	0.36	0.28	1.69	1.05

BASE refers to base case elasticities: SIGMAMM = 8 and SIGMADM = 4.
LOW refers to low elasticities: SIGMAMM = 4 and SIGMADM = 2.

TABLE 8: MARGINS SIMULATIONS

	AUSTRALIA		JAPAN		US		ALL COUNTRIES	
	BASE	**LOW**	**BASE**	**LOW**	**BASE**	**LOW**	**BASE**	**LOW**
AUS	3.08	2.74	0.56	0.72	0.34	0.36	3.45	3.36
NZL	0.14	0.3	0.31	0.5	0.07	0.13	0.58	0.96
CAN	0.34	0.4	0.38	0.42	0.42	0.49	5.2	5
USA	0.23	0.21	0.34	0.38	1.07	0.99	1.2	1.17
JPN	-0.16	-0.11	4.03	3.7	-0.23	-0.21	4.04	3.76
KOR	0.07	0.06	0.15	0.21	0.05	0.07	0.14	0.23
E_U	-0.09	-0.09	-0.08	-0.05	-0.08	-0.06	-0.08	-0.03
IDN	0.04	0.13	0.42	0.72	0.02	0.1	0.54	0.98
MYS	0.4	0.57	0.62	0.84	0.26	0.3	0.92	1.42
PHL	-0.07	-0.04	0.04	0.41	-0.02	0.1	0.12	0.59
SGP	-0.43	-0.59	-0.12	0.05	-0.22	-0.18	-0.29	-0.27
THA	-0.14	-0.23	0.61	0.93	0.03	0.08	0.7	0.99
CHN	0.06	0.17	0.05	0.17	-0.05	-0.03	0.16	0.42
HKG	-0.69	-1.21	0.05	0.22	-0.08	-0.08	-0.48	-0.76
TWN	0.08	0.27	0.1	0.23	-0.06	-0.01	0.28	0.6
ARG	-0.02	-0.04	0.04	0.07	0.03	0.04	0.07	0.1
BRA	-0.12	-0.07	-0.13	-0.12	-0.11	-0.08	-0.07	0.02
MEX	-0.02	-0.07	0.14	0.18	0.26	0.4	0.33	0.44
LAM	0.05	-0.09	0.39	0.48	0.39	0.5	0.63	0.82
SSA	0.06	-0.09	0.14	0.17	0.07	0.03	0.08	0.14
MNA	0.18	0.06	0.6	0.71	0.25	0.2	0.61	0.73
EIT	-0.04	-0.08	-0.03	-0.05	-0.04	-0.06	-0.04	-0.06
SAS	0.18	0.07	0.21	0.17	0.19	0.12	0.2	0.17
EFTA	-2.32E-04	0.05	9.07E-03	0.07	-9.89E-03	0.05	9.68E-03	0.09
LDC	0.01	-0.02	0.17	0.24	0.07	0.09	0.21	0.32
DEV	0.06	0.06	1.02	0.97	0.25	0.25	1.47	1.42
WLD	0.05	0.05	0.84	0.82	0.21	0.22	1.21	1.19

BASE refers to base case elasticities: SIGMAMM = 8 and SIGMADM = 4.
LOW refers to low elasticities: SIGMAMM = 4 and SIGMADM = 2.