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Global Impacts of Zero-for-zero Trade Policy in the World Oilseed Market: A Quantitative Assessment

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***Abstract*:** Many WTO member countries have expressed interest in a "zero-for-zero" (ZFZ) policy regime for oilseeds and oilseed products which entails removing all import tariffs and export taxes. A ZFZ policy would have substantial implications not only for oilseed trade flows but also for the composition of trade given the high disparity in tariff levels between OECD and non-OECD countries and high tariff escalation between oilseeds and products for most countries. To examine the implications of the ZFZ regime on oilseed trade and welfare, the GTAP model was modified to allow for multi-product structure fitted to the joint production of oilseed processing. Using GTAP V5, a special purpose disaggregation of the "oilseed products" into "edible oils" and "meals" was also performed. A simulation of ZFZ regime shows a significantly greater expansion of global trade in edible oils compared to oilseeds while meals show little trade increase. While there is relatively little growth in imports by Japan and the EU, much growth takes place in Asian importing countries (Korea, India, China) and the Middle East & North Africa (MENA) region. The ZFZ also results in substantial shifts in processing locations, but the tradeoff between lower oilseed processing and higher imports of products shows minimal impact on overall consumption of oilseed products in countries like the EU and Japan. Much of import growth in Asia and MENA is driven by the expansion in vegetable oil consumption. This provides a boost for exporters of high oil content seeds such as rapeseed (Canada) and palm oils (Malaysia and Indonesia). The United States also benefits from the ZFZ with oilseed exports increase more than products in value terms. China's participation also offers significant additional boost to US exports.

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1. Introduction

New agricultural trade negotiations under the WTO were initiated in the year 2000, as part of the "built-in agenda" mandated by the Uruguay Round Agreement on Agriculture (URAA). During the UR negotiations, many member countries explored options for furthering liberalized trade in the oilseed sector, but no agreement was reached. In the context of new WTO agricultural negotiations, there is renewed interest in a 'zero-for-zero' agreement, which would require a reciprocal elimination of all trade duties among WTO member countries.

The zero-for-zero concept for oilseeds is not a new idea and already has a history in the previous GATT rounds, starting with the Dillon Round (1960-61) where the European Union negotiators agreed to exempt oilseeds and oilseed meals from import duties (Bickerton and Glauber, 1990). At that time the EU was by far the largest importer of oilseeds and oilseed products. During the Tokyo Round, Japan also agreed to a zero duty on soybean imports. However, during the Uruguay Round, member countries failed to agree to a comprehensive zero-for-zero policy on oilseeds and products.

Although trade barriers in oilseeds and products are lower than for many other agricultural products, there is a great disparity in tariffs across countries, with non-OECD countries generally having higher import barriers. This is important given that much of the growth in demand for oilseed imports has occurred in developing countries, particularly in Asia. Part of this growth is attributed to post-Uruguay Round trade liberalization. Two countries have become significant players in oilseed trade in the last decade: India and China. Following the Uruguay Round, India replaced quantitative restrictions on oilseed imports with tariffs, resulting in a significant expansion of vegetable oil imports. In China, domestic economic reforms since the mid-80's have resulted in a switch from net exporter to net importer status in oilseeds and products.

In most countries, there is significant tariff escalation between oilseeds and oilseed products. In many OECD countries, there are zero tariffs for oilseeds and meals but relatively high import tariffs for vegetable oils (US, EU, Japan). In many developing countries, protection of domestic processing industries means higher import duties for oilseed products than oilseeds; but in countries where promoting the livestock sector has become a priority (Korea, China), there are lower tariffs for meals than for vegetable oils. Under a liberalized trade regime, elimination of tariff escalation would result in significant changes in the composition of trade. Moreover, given the rising share of developing countries in world oilseed trade, a multi-lateral tariff liberalization would likely lead to significant production and trade adjustments.

The goal of this article is to analyze how trade liberalization in the oilseed complex is likely to affect global trade in oilseed and oilseed products. A global trade model is applied in a quantitative assessment of a global zero-for zero policy, following the Uruguay Round framework in separating out agricultural policies into import tariffs, export subsidies and domestic support policies. However, this article does not attempt to assess any specific proposal in the context of current WTO negotiations on agriculture. The remainder of this article is divided into two sections. Section 2 provides an overview of oilseed trade policies among the major oilseed producers, exporters and importers. It also examines the extent to which existing trade-distorting policies affect changes in the global oilseed import demand and the patterns of

trade flows. This background review provides the motivation for section 3, which provides the quantitative assessment of the impacts of a ZFZ policy scenario on oilseed trade, production and economic welfare. The paper concludes with a short summary of implications.

2. Developments in oilseed trade policies and impacts on global trade

A review of trade policies in the oilseed complex reveals a high degree of disparity in trade-distorting interventions between the major producing and trading countries. Table 1 shows the trade-weighted average tariffs for aggregated oilseeds and oilseed products (meals and oils) as aggregates for 1998 using the AMAD data base[1]. Among the major OECD countries, including the US, EU and Japan, tariffs for oilseeds and meals are either small or zero, while vegetable oils are subject to higher tariffs. Likewise, many non-OECD importing countries, such as Morocco, pursue similar policies by maintaining higher tariffs for oilseed products than for whole beans to protect domestic processors (table 1).

While the major OECD countries have relatively low tariffs on oilseeds, they provide support for domestic production through farm subsidies. The US provides price support for soybean and peanut producers, which affects production and therefore indirectly trade. Canada also combines relatively low tariffs for oilseeds and products with direct "amber-type" domestic support for rapeseed producers. Nevertheless, in both Canada and the US (except for peanuts), oilseeds acreage and production are largely market-driven and determined by relative net returns compared to alternative crops.

The European Union also has zero tariffs for oilseeds and meals but higher tariffs on vegetable tariffs. However, the EU domestic oilseed production has been supported through high direct production subsidies via producer supports since the 1970's. The EU has since revisited these production subsidies twice: first in 1992, when oilseed acreage was subjected to a cap under the WTO Blair House Agreement and producer price support replaced by producer area payments, and more recently under the Agenda 2000 reform package which brought oilseed acreage support to parity with cereals. However, the extent of domestic support in oilseeds has helped boost EU production significantly, resulting in substantial reductions in the EU share of oilseed imports, from about 50 percent in the late 1980's to about 35 percent currently.

Argentina and Brazil, two major exporters of soybeans and products, pursue trade policies that are liberal on the import side (low import tariffs). On the export side, Argentina (and Brazil until 1996) imposes differential export taxes on soybeans and offers rebate to exporters of oilseed products, thus favoring domestic processing and value added exports (Hoffman, Dohlman and Ash, 2000). However, export taxes in Argentina have been falling in recent years. In the case of Brazil, the removal of the oilseed export tax in 1996 stimulated both soybean output and exports, hence providing stiffer competition with US soybean exports.

[1] AMAD data base is the Agricultural Market Access Database jointly developed by the USDA Economic Service, OECD, The European Commission, the FAO and the UNCTAD. The database was complied to help WTO member countries with analyzing the impacts of various trade liberalization scenarios.

Malaysia and Indonesia are the world's leading exporters of palm oil and like Argentina and Brazil have also combined a liberal import tariff policies with differential export taxes to promote high value-added exports, particularly favoring refined palm oil over crude palm oil. Malaysia exports a large share (over 80 percent) of domestic palm oil output and dominates the vegetable oil markets in India, Pakistan and China. Indonesia also has continued to expand its vegetable oil export markets and has the potential to continue expanding in the future. However, unlike Malaysia, Indonesia's national edible oil policy is geared to assure adequate supplies to its large population of 220 million. Consequently, Indonesia's past policies have included export restrictions for palm oil either via quotas or export bans. These restrictions have eased in recent years, as Indonesia adopted a more liberal approach to palm oil trade by removing export quotas and reducing tariffs.

In addition to these traditional importers, the continuing shift in vegetable oil import growth towards developing countries has been strengthened by the emergence of two major importing countries: India and China. During the last decade India emerged as a major importer of edible oil following economic and trade reforms. India also exports oilseeds (peanuts) and has become a major exporter of oilseed meals. As part of the Uruguay Round commitments, India removed its quantitative restrictions on edible oil imports and replaced them with tariffs and submitted to reductions. This immediately led to a surge of edible oil imports, as domestic prices are much higher than world prices, even after accounting for tariffs and consumer price subsidies.

India's emergence as a major importer of edible oil in the world market illustrates the impact of trade liberalization on global import demand for oilseeds. Prior to the Uruguay Round, past policies of import-substitution and self-sufficiency were pursued with quantitative restrictions on edible oil imports coupled with production subsidies which resulted in increased domestic output despite the lack of comparative advantage in oilseed crops. This policy of subsidized production was accomplished at an enormous cost, as output expanded without any productivity gains while limited resources (particularly irrigated land) was diverted from other more profitable uses (Pursell, 1996). Under this regime consumers paid a very high price for edible oils despite government consumer price subsidies.

Following the post-UR liberalization, India's highly price-elastic edible oil market experienced an explosion of imports, and despite some recent hikes in tariff rates, imports continue since India is still bound by its UR commitments not to return to quantitative restrictions. As a result India has emerged as one of the world's largest importers of edible oil and is likely to continue to be so in the future, given India's large structural demand and supply gap. In 1999, India imported 4.8 million metric tons, of which 3.2 million tons are palm oil and about 0.94 million metric tons are soybean oil.

China is another populous country that emerged as a major importer of edible oil and other oilseeds in the last decade. China changed from a net exporter to a net trade importer of oilseed and products as a result of economic reforms that began since 1986. Currently China can account for up to 10 percent of total world trade in edible oils, a substantial leap from the minor import levels of the early 1980's. Therefore, China's oilseed trade policies can have significant impacts on world markets. Currently, China is not a WTO member and the import regime for vegetable oil is not totally liberalized since China continues to use a non-transparent quota to

control vegetable oil imports. Moreover, conflicting policy objectives between promoting the livestock sector (favoring meal imports) and helping domestic processors (higher import tariffs for oilseed products imports via the value-added tax) have created policy reversals and uncertainty for oilseed trade. For example, the 1998 VAT exemption of soybean meal imports had brought the domestic crush industry to a state of crisis, leading to a surge of soybean meal imports. In response, the soybean meal VAT was reinstated in 1999 and a more stringent control of vegetable oil quotas was imposed to combat illegal smuggling. Consequently, vegetable oil imports were lower in 1998 and 1999 and China shifted toward greater use of domestic oilseed crushing capacity to reduce imports of protein meal and vegetable oil. With China's expected accession to the WTO and taking into account its proposed tariff liberalization commitments as required by the accession agreement, the potential for even larger expansion of imports in oilseeds and products is substantial. These changes are likely to have positive impacts on the US and South American export prospects given China's growing demand for soybean meals (to satisfy growing livestock feed demand).

In summary, this review shows a great degree of disparity in oilseed trade policies between countries. While the major exporters with a comparative advantage in oilseed production follow liberal import policies (relatively low tariffs), they also intervene either in production via producer, price or income support (USA, Canada) or in processing and trade via differential export taxes to favor value-added exports (Argentina, Brazil, Malaysia, Indonesia). The European Union's significant expansion of its own oilseed production and consequent stagnation of import demand is largely due to very high production subsidies. For other major importers, high differential tariffs are imposed to restrict imports of oilseed products. (i.e., Japan, Korea, Mexico) while allowing relatively unrestricted imports of oilseeds. India's reforms under the UR have opened up a major import market for edible oil. Likewise, China's emergence as a major oilseed importer is likely to have significant impacts on the world oilseed market. China's accession to the WTO and the consequent disciplining of oilseed trade policies are likely to offer a significant boost for competitive exporters, such as the US and Brazil.

What implications will a multilateral zero-for-zero policy on oilseeds and products policy have for global world oilseed trade and the export prospects of particular countries? Will the removal of differential export taxes have much impact on relative competitiveness among exporters? How will the removal of tariff escalation by importing countries affect tradeoffs between imports of oilseeds (and increased domestic crushing) and imports of oilseed products? How will differential growth in import demand for oilseeds vs. oilseed products affect the major exporters who hold dominant positions for various markets within the oilseed complex? For example, will the US benefit from a greater expansion of vegetable oil trade compared to whole seeds? The next section provides a quantitative assessment of both the magnitude and direction of these adjustments to a zero-for-zero policy.

3. Assessing the "zero-for-zero" policy scenario: Simulations and Results

To examine the global trade, production and welfare effects of a zero-for-zero trade regime, the static GTAP Model (Hertel, 1997, ed.) was modified to allow for multi-product agricultural technology and was fitted to the joint-product structure for oilseed processing. The standard GTAP model treats agricultural products as single output sectors. This single commodity-

industry mapping feature of GTAP is justified in order to permit a more uniform representation of agricultural sectors across the many regions of the model. However, in some cases, a multi-product representation of agricultural technology is more appropriate, particularly when it comes to analyzing farm policies. This is because trade policies often differ among farm commodities or even by products of the same raw agricultural product.

For example, the GTAP database treats products of oilseed processing as a single aggregate "oilseed products". However, there are several critical reasons why meals and edible oils need to be separated in trade liberalization analysis. First, the determinants of demand for meals (via livestock market) and edible oils (rising income and population) are quite different. This is particularly relevant in multi-lateral policy analysis encompassing both high and low income regions. Second, for most countries, there is a significant contrast in tariffs between meals and edible oils, with the latter typically more protected than the former (see table 1). Third, the trade status for oilseed products varies among countries, which has implications on trade and welfare effects of liberalization. For example, the EU is a net importer of meals but a net exporter of vegetable oils. By contrast, India is a major importer of vegetable oil but export surplus meals given the low domestic demand for compound feed. The respecification of GTAP model to allow for a multi-product technology overcome this serious limitation in policy analysis, and offer a much better of examining the implications of zero-for-zero policy regime in the oilseed complex. In this analysis, the multi-product feature of modified GTAP turns the aggregate sector "oilseed products" into a raw product processed into two finished products: meals and oils produced in fixed proportions with zero elasticity of transformation.

The underlying data set is the GTAP data base version 5 covering 65 countries and regions covering the world economy[2]. For each economy, the model incorporates an exhaustive description of inter-industry linkages at the 57-sector level, including 20 in primary agriculture and food industries. The country/regional aggregations used in this analysis include: The U.S., Canada, Mexico, European Union, Argentina, Brazil, Oceania (Australia plus New Zealand), Japan, Korea, Malaysia, Indonesia, China, Taiwan, India, Rest of South Asia, Rest of Latin America, Central European Associates, Middle East & North Africa, and Rest of World. In this model, the sector "oilseed" is treated as an aggregate (include soybeans, rapeseed, sun etc.) while the sector "oilseed products" is disaggregated into "meals" and edible oils" aggregates using a special data disaggregation procedure based on the work of Elbehri, Hertel and Martin (1997).

Before we analyze the impacts of zero-for-zero liberalization scenarios in oilseeds, a baseline simulation was carried out to project the world economies as they might look in the year 2005. The projection to the year 2005 was done using expected growth in population, factor endowments (unskilled labor, skilled labor and physical capital) and total factor productivity. The endowment of land and natural resources are assumed to be constant. The actual projected growth rates for population, factor endowments, and GDP used in generating the baseline are obtained from various sources including USDA (1998), OECD (1998) and the World Bank macroeconomic projections. (for more details on the methodology used to carry out these projections see Hertel et al., 1996).

[2] The GTAP model is solved using GEMPACK (Harrison and Pearson, 1996).

The baseline projections take into account the full implementation of the Uruguay Round agreement and, together with structural change, the pattern of production and trade, including agricultural sectors is expected to be quite different in 2005 compared to the base year (1995). In many countries, the factor endowments are expected to increase significantly and capital/labor ratios in different countries and industries will change. This will create supply-side pressures for changes in the composition of output between sectors in some countries. These "Rybczynski" effects are not accounted for in the partial equilibrium models. However, they have been found to be important determinants of structural change in rapidly developing economies (Krueger 1977; Leamer 1987; Martin and Warr, 1993).

Finally, differences in income responsiveness of demand for commodities (Engel effects) will affect the net export position of a given country and commodity group[3]. For example as the model project a rapid growth for China and rising per capita income, the income elasticities of demand play an important role in the model. With the exception of China, all income elasticities are drawn from the FAO data base, and are comparable to those used in the study by Alexandratos (1995). Non-food income elasticities of demand are also required, due to the economy-wide nature of the model. These are obtained from international cross-section studies conducted by Theil, Chung and Seale (1989). In the case of China, income elasticities of demand are obtained from Zhi and Kinsey (1994) and Fan, Wailes and Cramer (1995).

Trade policy liberalization simulations for the world oilseed sector are performed on the basis of the baseline 2005. In this analysis, oilseed trade liberalization consists of removing border barriers- all applied import tariffs and export taxes, expressed on an *ad valorem* basis. However, no changes to other agricultural policies (export subsidies, domestic amber box support) are made. Other agricultural policies such as domestic supports are assumed unchanged throughout the projections period to the year 2005.

Agricultural tariffs and export taxes in GTAP version 5 are derived from the Agricultural Market Access Database (AMAD) a recent and comprehensive database for market access. Nevertheless, in the case of oilseeds, several tariff adjustments were necessary in order to reconcile with available tariff data from USDA Gains Reports as well as national tariff schedules for some regions. Moreover, since meals and edible oil aggregates are not explicitly represented in GTAP V5, tariffs and export taxes/subsidies were collected from outside sources at the 19 regional aggregation used in this analysis.

Since the focus of this analysis is on removing tariff barriers, the estimated impacts of a zero-for-zero proposal will depend critically on the levels of tariffs and initial trade market shares in the pre-simulation data base. Figures 1A and 1B illustrate the export shares for "oilseeds" and "oilseed products" in the pre-simulation database for three exporters-- the U.S., Malaysia, Argentina and Brazil and four importers-- China, India, the European Union, and the MENA region. The graph shows that as percent of total exports, Malaysia exports large shares to MENA, China and India. The U.S. export shares of oilseed products are concentrated in China

[3] For a partial equilibrium analysis of oilseed liberalization that abstract from these income effects, see Meilke and Swidinsky (1998).

and MENA, while Argentina's export shares are highest for MENA and relatively small for the EU and India.

The ZFZ policy scenario builds on the baseline database 2005 and considers a total elimination of imports tariffs and export taxes. However, export subsidies are not changed in this analysis. Export subsidies for oilseeds and products are relatively minor and are present only in the EU for rapeseed. Two policy scenarios are considered for the projected world economy in 2005. The first scenario ZFZ_CURR consists of removing all import tariffs and export taxes simultaneously on all oilseeds, meals and oils from current WTO members, excluding China and Taiwan. An alternative scenario considers the same policy shocks for WTO inclusive of China and Taiwan. The second scenario is also repeated for WTO members inclusive of China to evaluate China's WTO accession. Prior to implementing a global ZFZ inclusive of China (ZFZ_WCHN), we implement an accession scenario which considers only China's implementation of WTO commitments in the oilseeds and products. In this scenario, tariffs imposed by China are reduced to 3 percent for oilseeds and 9 percent for products. The second ZFZ_WCHN scenario is then considered in a world where China has already implemented its WTO accession commitments in oilseeds and products.

Global Trade Impacts and Implications for the U.S.

Under the first scenario ZFZ_CURR, the global oilseeds trade increases by 4.9 percent relative to the base, or by an additional $US 1180 million (table 2). By comparison, trade in oilseed oils grows by 10.3 percent or $US 3143 million, while oilseed meals show a much smaller increase at 0.9 percent or $US 56 million (table 3). The magnitude of these gains reflects the potential for growth in the world oilseed complex under a duty-free regime. The results also highlight the significance of tariff escalation in the oilseed complex, which implies a greater potential for growth in vegetable oils trade than is oilseeds under a liberalized trade regime.

Tables 2 and 3 show the percentage changes in imports from the base period for selected regions in the model. Under the ZFZ_CURR scenario, there is no growth in oilseed imports for Japan (-0.2%) and the oilseeds and meals imports for the EU (0.2%). This reflects the existing zero-duty status for these products in the two regions. On the other hand, the elimination of tariffs on oilseed products leads to a significant increase in meals and oils imports into Japan (16.9% and 10.9%, respectively) and 13 percent increase in oils imports into the EU. The implication for both Japan and the EU is that some crushing facilities will shut down, as market prices for imported oilseeds products become more competitive. This larger growth for oilseed products (meals and oils) is also significant in the case of Mexico, which shows no growth in oilseeds imports (0.1%) but a substantial import increase in meals (39.9%) and oils (6.5%). This result is consistent with Mexico's liberal import regime for oilseeds and higher import tariffs for oilseed products. In all the three cases of Japan, the EU and Mexico the main effect of the ZFZ_CURR scenario is a tradeoff with less crushing of imported oilseeds and higher imports of oilseed products.

As a result of Korea's complex trade oilseed policies, ZFZ leads to an increase in oilseed imports (11.8%), a decrease in meals imports (-21.8%), but an increase in oils imports (6.9%). This is because initial tariffs are higher for oilseeds (35%) and vegetables oils (41.5%) but much lower

for meals. Increased imports of oilseeds leads to higher domestic crushing and hence imports of meals, but demand for oils is larger than increased domestic supply for crushing.

The Middle East and North Africa (MENA) region on the other hand shows an increase in imports of both oilseeds and oilseed products under the ZFZ_CURR scenario. This outcome reflects high import tariffs, low domestic crushing capacity and a much higher demand for oilseeds and products than supplied domestically. India also shows an expansion of imports for oilseed oils by 46.9 %. Considering that India has already become one of the largest importers of vegetable oil, these results imply a still larger potential for vegetable oil growth in the Indian market. The combination of higher import tariffs and lower comparative advantage due to low productivity including infrastructure bottlenecks implies that India still has a substantial potential for further growth in vegetable oil market.

The global trade expansion under the zero-for-zero regime is shared unevenly among exporting countries. Under this scenario, the U.S. increases exports by 5 percent for oilseeds, 18.1% for meals and 5.9% for oils compared to the 2005 base without the tariff liberalization. In dollar terms, the net trade balance for the U.S. is equal to $US 463.9 million for oilseeds, much larger than meal exports ($US 55.8 million) while vegetable oils exports show virtually no change ($US 3.4 million). Given the U.S. dominant position in oilseed markets, the ZFZ policy regime offers substantial revenue gains for U.S. producers, much larger than the gains for U.S. processors. Canada, on the other hand, whose oilseeds are dominated by high-oil content canola, increases exports of oilseeds oils (canola) by 6.8 percent, twice as much as export increases in whole oilseeds (3.5%). This shows that Canada also benefits from the expanded world demand in vegetable oils. Canada also expands imports of edible oils to a level where the net trade balance for edible oils is negative (table 3).

Among South America producers, Brazil's exports of oilseeds expand by 6 percent compared to 13.6 percent for Argentina under the ZFZ regime. For vegetable oils, Argentina shows no growth despite the larger world demand increase. This is because Argentina also removes the differential export tax on oilseeds, which favors oils over beans. By contrast, Brazil, which no longer has differential export taxes on oilseeds, shows a positive growth in edible oil exports (3.5%) and a smaller increase for meals (1.9%) (table 3). The other major vegetable oil exporters that also benefit from expanded in demand are Malaysia and Indonesia; these countries increase palm oil exports under the ZFZ regime by 8 and 7.2 percent, respectively. However, unlike Malaysia, Indonesia has a greater potential for production and export expansion given significant unused productive capacity of palm oil.

Table 4 shows changes in bilateral exports changes by source. For example, Canada expands exports of vegetable oil Japan, Korea, Malaysia and other Asian importers, but reduces exports to China. This is because China as a non-WTO member is not included in the multilateral trade liberalization for oilseeds and products. Brazil also increases its exports to all the major export markets both in Asia (Japan, Korea), Europe and the Middle East. The exception is China, which is one of Brazil's major export markets in the baseline dataset. Malaysia's also spreads its edible oil export growth to most major import markets.

Global and regional welfare effects

Welfare effects following a policy change reflect the net economic gain or loss on the whole economy. In this analysis, welfare gains arise if the policy change (elimination of all tariffs and export taxes by WTO members) leads to improved production efficiency (allocative efficiency) or improved terms of trade, which an increase in the price of exported good relative to the price of imported goods. A common measure of welfare is the "equivalent variation" concept, which measures the cost to consumers of the same bundle of goods before and after the policy change.

In terms of equivalent variation, global welfare under the ZFZ_CURR scenario shows no net change. Regional welfare shows a modest growth for some countries and a small loss in others (table 5). For some net importing countries like Korea and the MENA region, welfare slightly improves as high tariffs are removed, with the rise of imports leading to a more efficient reallocation of productive resources. The United States welfare increase by $US 114.6 million much of which come largely from improved terms of trade. Malaysia and Indonesia also show a slight welfare gains of $US 36.6 and $US 37.3 million due to improved terms of trade. Argentina and Brazil's welfare gains are $US 139 million and $US 168.3, due to both allocative efficiency gains and favorable terms of trade (table 5).

For countries that are both major importers and exporters of oilseeds and products, the welfare effects from the ZFZ policy are either slightly positive (Canada) or negative (EU) depending on the net effect from own and trading partners' tariff distortions and from domestic policy interventions in the oilseed sector. In the case of Canada, the welfare gains from terms of trade ($US 37.5) are larger than the losses from allocative efficiency ($US –11.7 million). This economic efficiency loss results from Canada's increased oilseed production in response to increased foreign demand while the sector continues to receive production subsidies (not removed in the ZFZ scenario). In this case, productive resources are inefficiently shifted to the subsidized oilseed sector leading to allocative efficiency loss. However, this loss is much smaller than gains from terms of trade; hence Canada has a net welfare gain under the ZFZ scenario.

For the European Union, the opposite trade off takes place with a gain in allocative efficiency but a welfare loss in terms of trade. For the EU, the allocative efficiency gains derive mostly from the efficiency gains due to increased imports of oilseeds oils as a result of removing import tariffs under the ZFZ regime. The positive import expansion effect on welfare dominate the small negative welfare effect from the domestic production side as subsidized oilseed production increases in the EU in response to higher foreign demand due to higher increased imports of oilseed oils.

China's WTO accession and Zero-for-zero with China

Given China's anticipated accession to the WTO and the importance of China in the world oilseed market, the zero-for-zero policy scenario described above was repeated for the same set of countries plus China and Taiwan. The implementation of China's accession to the WTO was simulated in a scenario whereby China reduces its oilseed tariffs to 3% and oilseed products to 9%. The updated database is then used to implement the zero-for-zero scenario with China referred to as ZFZ_WCHN.

Table 6 shows the export changes for oilseeds, meals and oils in the ZFZ_WCHN scenario. The implementation of the zero-for-zero scenario with China (ZFZ_WCHN) results in an expansion of global trade by 6.0 for oilseeds and 11.1 percent for vegetable oil. Under the ZFZ regime inclusive of China, the U.S. expands oilseed production by 2.2 percent (compared to 1.6% under ZFZ_CURR). U.S. exports of oilseeds also increase by 4.5 percent under ZFZ_WCHN (compared to 3.4% under ZFZ_CURR). By contrast, Brazil increases exports of vegetable oils by 3.7 percent under the ZFZ scenario with China. However, these results under ZFZ_WCHN are not far different from the ZFZ_CURR without the participation of China. This is because much of China's policy reforms are already offered under the terms of accession. Therefore, an alternative scenario schedule would be to separate between China's WTO accession and additional reforms to implement a zero-for-zero regime.

4. Conclusions

As part of the current WTO agricultural negotiations, a number of countries have supported the "zero-for-zero" proposal for the world oilseed complex, which entails the elimination of all import tariffs and export taxes on oilseeds and oilseeds products. While oilseeds and oilseed products have generally lower trade protection in OECD countries, developing countries as a whole exhibit much higher trade barriers than OECD countries in their oilseed sectors, with a high degree of tariff escalation between oilseeds and oilseed products. Some exporting countries (Argentina, Malaysia) pursue discriminatory export taxes to favor value-added oilseed products. Trade distorting policies also include production support policies for oilseed in several OECD countries, displacing production and trade from low-cost producers, but these were not included in the analysis.

Over the last decade, the world oilseed market has experienced a significant shift in import demand growth away from OECD economies and toward the developing countries. This expansion of imports by developing countries arose from a combination of economic reforms with the adoption of more liberal policies. As a result, significant new markets emerged (China) and existing ones expanded (India, Thailand). Following the Uruguay Round many quantitative restrictions on imports were replaced by tariffs, allowing for new and expanded imports. In the post-UR environment, a multilateral agreement to further curtail or eliminate these tariffs may offer a substantial scope for additional trade growth in the global oilseed market.

Under the zero-for-zero scenario, the global vegetable oil trade is likely to grow at a greater rate than oilseed trade. This result underscores the significance of current tariff escalation policies between oilseeds and oilseed products in many countries. Moreover, much of the growth in trade results from expanded imports in major Asian importing countries, such as India and China plus the MENA region, while little or no growth in oilseeds imports occurs in Japan and the EU. Simulations results also show that the differential export taxes used by some countries (such as Argentina) have an impact on the composition of exports but an overall only a small impact on global trade.

One of the implications of the zero-for-zero policy scenario is an expected shift in oilseed processing locations as oilseed products tariffs are eliminated. The tradeoff between lower oilseed processing and higher imports of products would probably mean little impact on overall

consumption of oilseed products in countries like EU and Japan. However, we would expect a substantial increase in consumption of vegetable oil in major importing countries of Asia, plus the MENA region. Another implication is that the expansion in oil imports and consumption would help both high oil content seeds (Canada with rapeseed) and palm oils (Malaysia and Indonesia). This means that the implied benefits to soybeans may be overstated. Nevertheless, given the US dominant position in global oilseed trade and the expansion in global oilseed trade under the zero-for-zero policy regime, the US oilseed trade is likely to benefit. China's participation would offer significant additional boost to US exports.

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Table 1. Average Applied rates (1997-98)

	oilseeds	Meals	Vegetable oils
Australia_NZ	0.6	0.6	1.7
Japan	0.0	0.0	25.4
Korea	35.1	12.5	41.5
Indonesia	20.0	20.0	10.0
Malaysia	20.0	20.0	10.0
Taiwan	3.9	3.9	5.6
China	74.0	25.0	74.0
Rest of South Asia	15.3	11.6	11.6
India	40.0	33.0	33.0
Canada	0.0	0.0	9.0
United States	0.2	0.0	11.0
Mexico	3.1	19.4	19.4
Argentina	5.9	12.3	12.3
Brazil	5.9	12.3	12.3
Rest of Latin America	9.4	14.2	14.2
European Union	0.0	0.0	10.8
Central European Associated	3.4	3.6	3.6
Middle East & North Africa	17.3	14.1	14.1
Rest of World	14.1	11.3	17.8

Sources: GTAP Version 5; USDA Gains Reports; Various National tariff scehdules

Table 2. Zero-for-zero regime and output and trade effects for oilseeds

	Output change (%)	Domestic use change (%)	Change in exports (%)	Change in exports ($US M)	Change in imports (%)	Change in imports ($US M)	Trade balance ($US M)
Importers							
Japan	2.6	-0.4			-0.2	-9.8	0.6
Korea	-22.2	-22.9			11.8	163.0	-180.7
China	-0.6	0.2			-0.9	-24.0	-38.2
Rest of South Asia	-3.3	-3.7			23.4	194.4	-196.2
European Union	0.7	0			0.1	7.2	86.1
Mexico	-0.4	-4.2			0.1	1.9	-3.1
M. ast & N.Africa	-7.6	-9.3			18.1	175.7	-163
Exporters							
Canada	1.8	0	3.6	88.1			95.3
United States	1.6	0.3	3.3	417.0			463.9
Argentina	0.4	-0.2	13.6	49.4			47.8
Brazil	1.4	-0.3	6	177.2			150.3
Rest of Latin Am.	-0.3	-3.2	5.1	48.7			-11.1

Source: Authors' simulations

Table 3. Output and trade effects of Zero-for-zero regime on oilseed products

	Output change (%)	Domestic use change (%)	Change in exports (%)	Change in exports ($US M)	Change in imports (%)	Change in imports ($US M)	Trade balance ($US M)
			EDIBLE OILS				
Importers							
Japan	-0.3	-2.4	72.4	37.8	10.9	68.8	-39.6
Korea	1.5	-0.9	104.5	14.3	6.9	32.5	-16.8
China	-0.2	2.5	-28.4	-161.9	-1.8	-80.0	-41.7
India	-0.3	-6.6	27.6	339.6	47	338.8	-114.6
Mexico	-0.4	-2.9	31.4	21.9	6.5	30.2	-8.7
M.East & N.Africa	-0.6	-6.5	34.9	243.5	6.9	321.1	-103.8
Exporters							
Indonesia	0	-3.1	7.9	86.2	16.5	75.6	13.8
Malaysia	4.1	-3.8	8.1	265.0	19.7	89.6	160.8
Canada	-0.1	-5.4	6.8	18.4	5	21.2	-1.6
United States	0.2	-5.2	5.9	200.6	18.3	191.3	3.4
Argentina	-0.2	-0.8	0.1	5.0	18.5	12.5	68.1
Brazil	0.2	-3.5	3.5	120.2	13	55.7	42.3
Rest of Latin America	-0.4	-6.6	23.8	187.3	12.3	214.9	-77
European Union	0	-3.6	11.4	518.6	13	825.0	-52.4
			MEALS				
Importers							
Australia_NZ	0.8	0.1	28.5	4.9	0.4	0.2	4.2
Japan	-0.3	-0.3	-5.1	0.0	16.9	5.3	-6.2
Korea	1.5	1.5	140.2	0.6	-20.6	-5.7	6.7
Indonesia	0	0.2	157.1	-5.3	-0.9	-1.3	-2.1
China	-0.2	-0.1	-32.7	-6.3	4.5	1.4	-7.8
Rest of South Asia	-0.6	-0.6	22	0.2	11.7	8.8	-11.9
European Union	0	0	0.1	4.9	-0.1	0.0	8.4
Central Europe	-0.9	-1	67	2.7	3.4	9.5	-9.1
Exporters							
Canada	-0.1	0	-0.1	-0.7	0.1	0.0	3.8
United States	0.2	0	18.3	57.4	-0.1	-0.7	55.8
Brazil	0.2	0.1	1.9	7.9	18.9	0.1	7.9
India	-0.3	-0.1	-7.7	-4.8	65.4	-0.1	-1.9

Source: Authors' simulations

Table 4. Effect of Zero-for-Zero regime on bilateral exports of vegetable oils

	Japan	Korea	Rest of South Asia	India	United States	Mexico	MENA
Indonesia	5.6	6.9	4.5	46.2	5.3	0.5	0.1
Malaysia	7.6	8.9	6.5	48.9	7.3	2.4	2.1
Canada	10.6	11.8	9.4	53.4	10.3	5.4	4.9
United States	9.8	11.3	8.7	52.4	10	4.9	4.2
Argentina	1.5	2.9	-0.2	39.1	0.2	-4.3	-4.4
Brazil	9.4	10.7	8.4	52.3	9.6	4.6	4
European Union	14.3	15.5	12.9	58.4	13.9	8.8	8.2

Source: Authors' simulations

Table 5. Welfare effects of Zero-for-Zero policy in the oilseed complex

	Total welfare	Allocative efficiency	Terms of trade
Australia_NZ	13.1	10.7	2.4
Japan	-57.8	-55.8	-2.0
Korea	101.3	22.5	78.8
Indonesia	37.3	20.2	17.1
Malaysia	36.6	27.5	9.1
Taiwan	-41.0	-19.0	-22.0
China	-14.5	-10.7	-3.8
Rest of South Asia	40.2	-17.4	57.6
India	-41.2	-79.6	38.4
Canada	25.8	37.5	-11.7
United States	114.6	109.8	4.8
Mexico	-10.5	-10.9	0.4
Argentina	139.0	100.1	38.9
Brazil	168.3	54.9	113.4
Rest of Latin America	-20.5	-34.4	13.9
European Union	-6.2	-30.5	24.3
Central European	18.4	17.9	0.5
M. East & N. Africa	63.5	8.9	54.6
Rest of World	233.5	-151.6	385.1

Source: Authors' simulations

Figure 1A

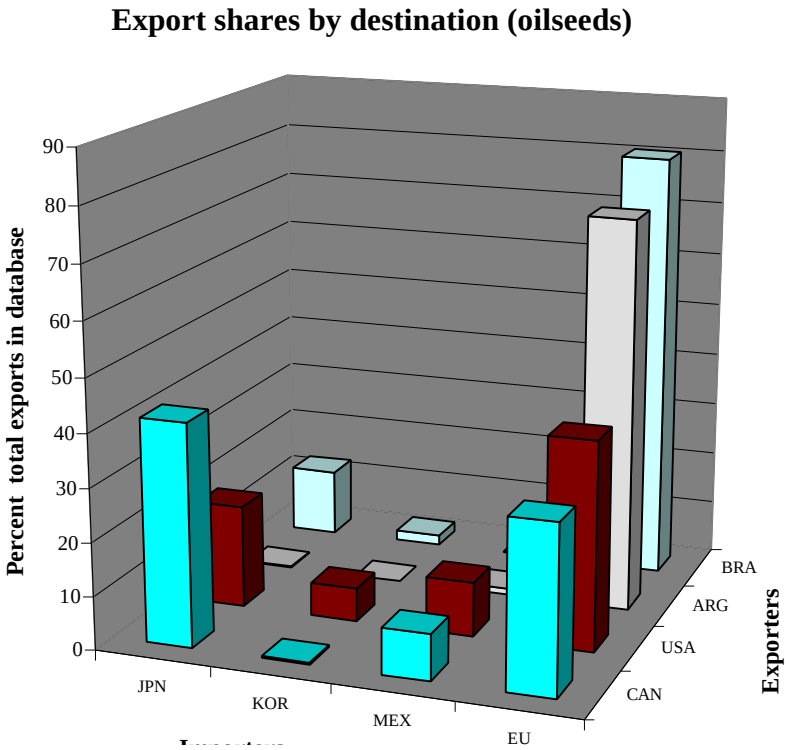

Figure 1B