Economic Impacts of Increased Tariffs that have Reduced Import Access for U.S. Fruit and Tree Nuts Exports to Important Markets

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Among the consequences of ongoing international trade turmoil has been increases in import tariffs and other access barriers facing many significant U.S. agricultural commodities in important markets.

This brief report summarizes potential impacts of higher tariffs facing major U.S. fruits and tree nuts. We calculate these potential impacts using recent trade and production data and some plausible assumptions. We provide here the key data and explain the economic reasoning and calculations. Available data files provide details on data, sources, and methods.

We investigate two potential impacts of the higher tariffs. First, we collected the appropriate data and calculated the value of the commodities shipped to the markets with higher tariffs. Second, we calculated the potential price impacts in remaining markets to which commodities facing higher tariffs must be diverted.

In summary, we find the trade losses for the commodities under consideration to be about $2.64 billion per year using the export value lost as a measure. Alternatively, using the potential impact on price in remaining markets as the measure of loss, the magnitude is about $3.34 billion.

Table 1 lists the ten commodities and four markets that we consider. The table shows that new tariff barriers apply to all ten commodities for exports to China. In the other markets, India, Mexico, and Turkey, new higher tariffs apply to selected fruit and nut products. Table 1 shows the amount of exports affected using averages for 2016 and 2017.

Throughout this report, we report shipments to China and Hong Kong together. However, the new tariff increases do not apply to shipments to Hong Kong unless they are then shipped to enter China. This fact is accounted for in the second pair of columns in Table 1 and all subsequent analysis. We understand that much of what goes directly to Hong Kong is subsequently shipped to China and for those shipments the new tariffs apply, but UN data show that some shipments to Hong Kong, in fact, are subsequently shipped to other destinations. Therefore, we do not apply the new China tariff to any of the quantities of fruits and nuts that are shipped from Hong Kong to these other destinations. We include in our analysis of the impact of the new China tariffs all exports to Hong Kong that are not accounted for by transshipments to countries outside China.

We understand that there may be other U.S. export destinations, such as Vietnam, from which products are subsequently transshipped into China we do not include any of these exports in our calculations and that may undercount the impact of the new China tariffs.

Of course, the new tariffs apply to current trade not these historical averages. However, with no data on current export potential, we use the historical averages to give an approximation of magnitudes affected. We use two years because crop production and exports are subject to substantial variation from years to year due to crop yield, price and demand fluctuations.

Table 2 summarizes the export value data from the full set of markets facing higher tariffs and for China/Hong Kong.

The first measure of impact of the tariff increases is the value of the trade affected. One way to mitigate the impact of the tariff impacts would be to find or create a new market where these displaced commodities could be delivered. Because of the nature of production of perennial crops, and especially of tree and vine crops, there is no reasonable expectation to change production quantities available from the current crop. In economics lingo, that means aggregate quantities supplied are fixed and inelastic with respect to price.

If the U.S. government proposed to mitigate the losses associated with products that must be diverted it could purchase the commodities that would have been exported to the newly restricted markets. The cost of such purchase measured at the US port of exit, is approximated by the value of exports affected which is shown in Table 2. This total is about $2.6 billion. Of course, the produce acquired in this way must be diverted from remaining market channels to avoid negative impacts on price.

Table 2 indicates the full value of exports to the markets that now have higher tariffs. It is possible that the new tariffs would not preclude all shipments to the affected markets. That is, the new tariffs may not be prohibitive. If some exports still entered after accounting for the tariffs one could simply adjust down the values in Table 2 proportionately for the share of export that was assumed to continue. So, if one thought that overall 20 percent of exports would be made despite the new high tariffs, the measure of lost exports would be 80% of the value shown in Table 2.

An alternative measure of loss is to consider the market impact of diverting back to the United States and remaining export markets the quantities of commodities that would have been shipped to the new high-tariff markets. Such increased quantities pushed into remaining markets would reduce the prices for sales in these markets.

We calculate such impacts as follows. First, we consider the importance of these markets to the production of each commodity. Table 3 shows, in the first column, the US production quantity for the affected commodity based on the average for 2016 and 2017. The second column of Table 3 lists the share of the average production quantity that was shipped to the newly restricted markets. These shares are quite large for the tree nuts, ranging from 12.6% for almonds to 21.6% for pecans. For the fruits the range is from about 1% for sour cherries and raisins to 9.3% for sweet cherries and 8.0% for fresh oranges.

The large shares of production have substantial price impacts. To make this calculation we must make an assumption about how responsive quantity demanded is to price for these crops. Four

considerations must be balanced. First, the tariff increases occurred near to the harvest and marketing of the crop, allowing little time for adjustment. Second, the impacts affect several products simultaneously limiting the adjustments of buyers across crops. These two factors along with the generally small responsiveness of consumption of food items to price changes suggest quite large price declines would be needed to accommodate the diverted quantities.

The third consideration is that some production from non-U.S. sources that would otherwise compete in global markets with U.S. produce may now be diverted to China and the other newly high-tariff markets. If such replacement were significant it might open new markets for U.S. produce and therefore reduce the impacts. Finally, storage of commodities and other factors may allow some mitigations of price declines. These last two considerations are likely to be moderate for the commodities considered because total market shares of U.S. produced goods are very large for several of the products and the main alternative market is the U.S. domestic market where imports are unimportant. We use a "price elasticity of demand" of -0.8 for almonds and -1.0 for the other commodities. Since the market into which the quantities are diverted is only the remaining share of the total market, the unrestricted market, this means that the percentage price impacts are more than proportionate compared to the percentage of the quantity diverted.

Table 4 shows, in the first column, the percentage price impacts implied by diverting supply from the markets affected by higher tariffs. As with our earlier calculations, if some exports were to continue to those market the price declines would be smaller.

The second column of Table 4 shows the revenue losses implied by these price declines. The first step is to calculate the actual dollar price decline. For this we apply the percentage decline to weighted average prices in 2016 and 2017. For these prices we use the weighted average export unit values to the affected markets. These export unit values are appropriate to reflect the qualities, time of year marketed and other factors that cause prices to differ across time, product specification and market for fruits and tree nuts.

Table 4 show large potential losses caused by diverting quantities from lost markets into the remaining market. Almonds alone account for about $1.6 billion in losses. Pistachios face losses of about $380 million. Major losses are experienced by many commodities. These are large in absolute terms and as a share of industry revenues.

Table 1: Quantity and Value of Exports to Markets Facing Increased Tariffs*

(Millions of $ and Millions of Kg.)

Commodity	China & Hong Kong Total		China & Hong Kong Adjusted		India		Mexico		Turkey	
	Quantity (kg)	Value ($)	Quantity (kg)	Value ($)	Quantity (kg)	Value ($)	Quantity (kg)	Value ($)	Quantity (kg)	Value ($)
Almonds	124.1	501.7	51.5	289.5	120.7	573.7			39.0	155.5
Pecans	27.5	171.1	27.5	171.1					0.1	0.6
Pistachios	85.3	594.3	43.0	409.2					4.2	21.0
Walnuts	24.6	70.9	14.3	44.4	14.0	44.9			50.3	157.5
Apples	48.3	57.5	46.2	53.6	79.8	80.0	247.1	252.6		
Oranges	145.4	126.9	140.4	121.1						
Raisins	10.9	26.5	10.7	25.9						
Sour Cherries	1.3	10.8	1.3	10.8						
Sweet Cherries	25.7	144.8	25.7	144.7						
Table Grapes	30.7	84.0	30.4	83.4						

*Average of 2016 and 2017.
Source: U.S. Commerce Department data available from the International Trade Commission Dataweb

Table 2: Summary of Export Value of Fruits and Tree Nuts Facing Increased Tariffs*

Commodity	Export Value ($Million)	
	All Countries	China and Hong Kong
Almonds	1,019	290
Pistachios	430	409
Apples	386	54
Walnuts	247	44
Pecans	172	171
Sweet Cherries	145	145
Oranges	121	121
Table Grapes	83	83
Raisins	26	26
Sour Cherries	11	11
Total	2,640	1,354

*Average of 2016 and 2017.
Source: U.S. Commerce Department data available from the International Trade Commission Dataweb

Table 3: Affected Exports as a percent of US Production*

Commodity	US Production (Million kg)	Percent of US Production Exported to Affected Markets
Almonds	1,672	12.6
Pecans	128	21.6
Pistachios	339	13.9
Walnuts	598	13.1
Apples	4,987	7.5
Oranges	1,762	8.0
Raisins	1,214	0.9
Sour Cherries	130	1.0
Sweet Cherries	275	9.3
Table Grapes	939	3.2

*Average of 2016 and 2017
Source: Export data from Table 1 and US production data from USDA, National Agricultural Statistics Service.

Table 4: Loss in Revenue due to Decline in US Price due to Tariff Increases in Affected Markets*

Commodity	Price Decline (%)	Revenue Loss ($ Millions)
Almonds	18.1	-1,580
Apples	8.1	-419
Pistachios	16.2	-384
Walnuts	15.1	-315
Pecans	27.6	-224
Sweet Cherries	10.3	-160
Oranges	8.7	-133
Table Grapes	3.3	-86
Raisins	0.9	-26
Sour Cherries	1.0	-11
Total		-3,338

*Average 2016 and 2017 and calculated as described in the text from implied price changes assuming all exports into markets with higher tariffs must be diverted to other markets.
Source: Author calculations using data from Tables 1, 2 and 3.