The Impact of Potential Aluminum Import Tariffs or Quotas

On America's Malt Beverage Industry

John Dunham &Associates*
New York

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Summary:

Whether or not importing aluminum from either Canada or China may have national security implications is up to the U.S. Department of Commerce, the White House Staff and ultimately the President of the United States to decide in their review process; however, one thing is certain, imported aluminum is extremely important for the malt beverage industry. About 5.7 percent of the manufacturers' cost of beer is the result of the aluminum used in beverage cans.

A tariff of 10 percent on imported aluminum would directly cost beer producers about $246.6 million. In addition, brewers will also see other costs rise due to higher prices for beverage cans. For example, financial carrying charges will increase, so will insurance costs, metals brokerage charges and even warehousing costs (it is generally more expensive to store more valuable products). All told, the industry will see increased costs of about $347.7 million following the imposition of a 10 percent tariff.

These higher prices would impact beer sales as well as domestic jobs. Based on models developed for the Beer Institute, as many as 20,300 American jobs could be lost because of high tariffs on aluminum. The losses in the beer industry alone could cost the country nearly $2.5 billion in economic activity and would ultimately cost the Federal government over $275.1 million in tax revenues.[1]

Figure 1
Overall Economic Impact of Potential Aluminum Tariff

	Jobs	Wages	Economic Output
Brewing	(590)	($47,073,000)	($502,341,000)
Wholesaling	(1,251)	($84,661,000)	($223,059,000)
Retailing	(8,247)	($223,660,000)	($481,036,000)
Beer Direct	(10,089)		
Supplier	(4,494)	($289,927,000)	($1,051,511,000)
Induced	(5,707)	($293,719,000)	($948,415,000)
Total	(20,291)	($583,646,000)	($2,480,962,000)
Change in Federal Taxes			($275,148,000)
Change in State Taxes			($277,386,000)

Values in the table above may not sum due to rounding.

The following analysis presents a detailed methodology of how a 10 percent tariff on imported aluminum will eventually work through the economy, to the production of cans, to the brewery, and ultimately to the consumer. It is based on a standard methodology and publicly available data and models.

As the analysis shows, while the imposition of tariffs might lead to a good sound bite, the ultimate cost falls on consumers and the American economy, not the intended target of the tax. In addition, because of the reduced demand for both aluminum and steel that would result from higher prices, a tariff of this nature is unlikely to lead to sustained increased production of primary metal in the U.S. Rather, continued efforts to ease the regulatory burden on the aluminum and steel industries would both lead to increased production and ultimately lower prices to consumers.

[1] Not including revenues generated by the tariff.

Background:

During the 2016 Presidential campaign, then candidate Donald Trump made a promise: "We are going to put American steel and aluminum back into the backbone of our country."[2] As a response to concerns about the potential that higher imports of aluminum and/or steel might impair the nation's security, President Trump signed a Presidential Memorandum prioritizing an investigation by the Secretary of Commerce into whether aluminum and/or steel imports threaten the economic and national security of the United States.

The U.S. Department of Commerce Bureau of Industry and Security, Office of Trade Evaluation, undertook separate studies of the aluminum and steel markets and issued its findings on January 17, 2018.[3] The Department's investigation of these markets was undertaken under Section 232 of the Trade Expansion Act of 1962. Under this provision the Secretary of Commerce can determine that an industry may require protection based on the *national defense* and *national security*, which the Department interprets as meaning that this includes the *general welfare of certain industries, beyond those necessary to satisfy national defense requirements which are critical to minimum operations of the economy and government.*[4]

In both reports the Department of Commerce (DOC) suggests that this standard means that the industry in question is operating at or above 80 percent of its currently installed production capacity. Under this standard, both the aluminum industry[5] and the steel industry[6] were found to be threatened by imports and that certain trade restrictions would allow them to regain a minimum level of production of 80 percent of capacity.

The DOC outlined a series of potential alternative protective measures that could be undertaken by the President to supposedly accomplish this goal. In both cases the alternatives consist of a quota alternative, a general import tariff, and a higher tariff targeting specific countries in conjunction with a quota on other exporting nations.

On March 1, 2018, President Trump announced his intention to impose a 25 percent tariff on imported steel products and a 10 percent tariff on imported aluminum products. The President's announcement suggests that these tariffs will provide the same measure of protection for the respective industries – allowing for increased production at 80 percent of capacity. In each instance the proposed tariffs would result in higher prices for imported aluminum and steel, which in turn will disrupt the existing domestic market for impacted products. This disruption will result in higher input costs for industries that consume both aluminum and steel as part of their production process, which in turn, will be passed through to other firms and eventually consumers. These industries – ranging from aircraft production, automobile production and construction of commercial and residential buildings as well as infrastructure, to consumer

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[2] *President Donald J. Trump Stands up for American-Made Aluminum*, The White House, Office of the Press Secretary, Press Release, April 27, 2017, at: https://www.whitehouse.gov/briefings-statements/president-donald-j-trump-stands-american-made-aluminum

[3] *The Effect of Imports of Steel on the National Security: An Investigation Conducted Under Section 232 of the Trade Expansion Act of 1962, As Amended*, US Department of Commerce, Bureau of Industry and Security, Office of Technology Evaluation, January 11, 2018; and *The Effect of Imports of Aluminum on the National Security: An Investigation Conducted Under Section 232 of the Trade Expansion Act of 1962, As Amended*, US Department of Commerce, Bureau of Industry and Security, Office of Technology Evaluation, January 17, 2018

[4] Ibid.

[5] Defined in the 232 report as unwrought aluminum (HS 7601), aluminum castings and forgings (7616.99.51.60-.70), aluminum plate, sheet, strip, and foil (7606, 7607), aluminum wire (7605), aluminum bars, rods and profiles (7604), aluminum tubes and pipes (7608), aluminum tube and pipe fittings (7609).

[6] Defined in the 232 report as: steel mill products which are defined at the Harmonized System ("HS") 6-digit level as: 720610 through 721650, 721699 through 730110, 730210, 730240 through 730290, and 730410 through 730690.

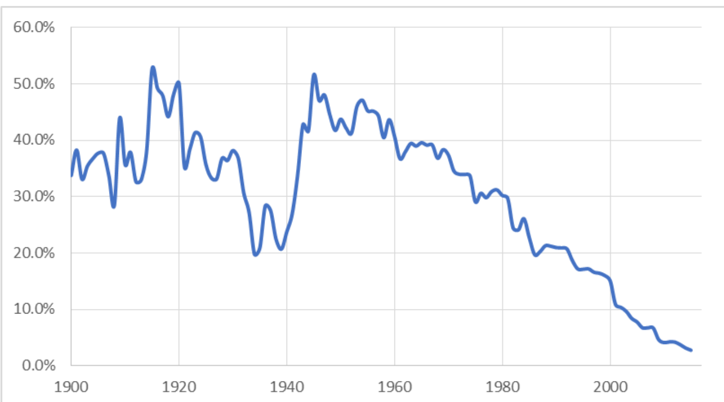
products like canned fruits and vegetables, beverages and computers – are located across the country and provide millions of jobs to American workers.

Basic economic theory tells us that higher prices will result in lower demand for manufactured goods, as well as for steel and aluminum inputs, costing domestic job losses across the economy. This report examines how these higher input costs will result in economic losses in the domestic malt beverage industry.

Historical Trends and Current Conditions in the Domestic Aluminum and Steel Industries:

American manufacturers and industries consume large amounts of primary aluminum and steel products, some of which is produced domestically, and most of which is imported. Over the past generation, the share of imports has increased dramatically in both industries, but this is a trend that has been occurring since before the end of the Second World War. Based on data from the U.S. Department of Interior, U.S. Geological Survey, at the end of World War II, the U.S. produced nearly 52 percent of the world's primary aluminum. This fell steadily over the past 70 years to just under 3 percent by 2015.[7] Production of primary aluminum in other countries has risen as smelters in the U.S. curtailed production. In other words, increased production in other countries was the result not the cause of the decline of U.S. production of primary aluminum.

Figure 2
US Share of Worldwide Primary Aluminum Production



High energy costs appear to be a major reason for the decline in U.S. production. Energy accounts for about 15 percent of the direct production cost of primary aluminum[8], and energy costs in the U.S. are comparatively higher than in other countries. Imports of primary aluminum are now dominated by countries with relatively inexpensive energy including Canada, Russia, the United Arab Emirates, and up until its economy collapsed, Venezuela. Data from the Department of Commerce confirms this. These countries currently account for 58.5 percent of U.S. primary aluminum imports by value.[9]

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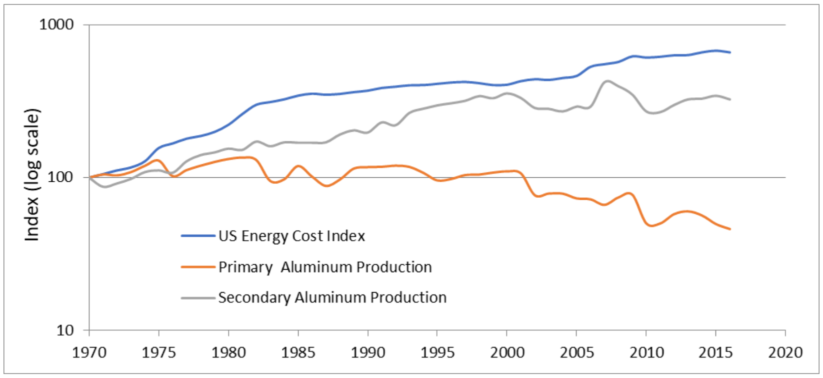
[7] USGS, 2015 is the latest year available.

[8] Based on an input output model of the US economy created by IMPLAN, Inc. (2016 input/output accounts). Import data from 1992 to 2017 from *USA Trade Online* (see note 3).

[9] Import data from 1992 to 2017 from *USA Trade Online* (see note 3).

Figure 3
Aluminum and its Relationship to Energy Prices



The United States tends to import aluminum from countries which are integrated into the U.S. defense system.[10] About 48 percent of imports come from NATO countries and 42 percent from the NAFTA free trade zone.[11] These imports are not a major contributor to the trade deficit. Imported primary aluminum accounts for just 2.8 percent of the nation's trade deficit. Since 2000, primary aluminum has accounted for between 1.5 and roughly 3 percent of the overall trade deficit.

Notably, however, while primary aluminum production in the U.S. has fallen, secondary aluminum production (which is aluminum products produced from primary) in the U.S. is up by 1,147 percent. The percentage of overall production from scrap has also risen significantly since the mid-1970s, which is consistent with the U.S.'s role as a significant user of aluminum. Production of scrap impacts production of primary aluminum because aluminum is an endlessly reusable commodity, and it takes less energy to remelt scrap than to melt primary aluminum.

While the U.S. is producing relatively little primary aluminum, this does not mean that other producers are "dumping" the metal at below market prices. In fact, the evidence suggests that aluminum prices have been relatively stable over time. Adjusting for inflation, the price of raw aluminum on the London Metals Exchange (the benchmark price for the metal), has fluctuated, and while it has not yet recovered to pre-recession levels neither has overall world economic activity.[12] Adjusted for inflation, current prices are well-above lows set in late 2015, and have been on an upward trajectory for two years. If there was dumping, prices would not be rising.

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[10] Import value (customs value) from *USA Trade Online*, US Department of Commerce, Bureau of the Census, On-line at: https://usatrade.census.gov/. Adjusted by the Producer Price Index for metals and metal products. *PPI Commodity Data*, US Department of Labor, Bureau of Labor Statistics, at: https://www.bls.gov/ppi/#tables

[11] U.S. Bureau of Economic Analysis, *Balance on current account [IEABCA]*, retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/IEABCA, February 1, 2018. The trade deficit in 2016 was $451,685,000,000 in nominal dollars. In 2000, it was, $403,450,000,000.

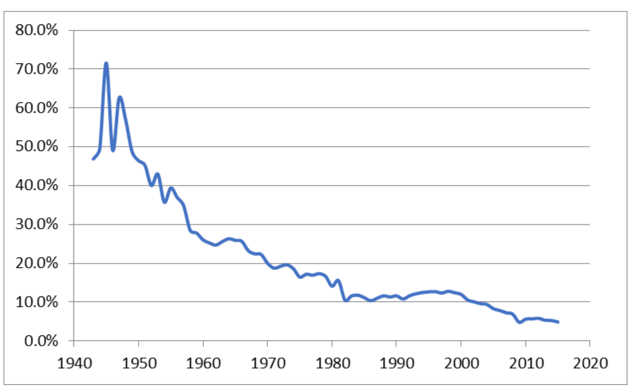
[12] Monthly settlement price for aluminum (first trading day of the month) on the London Metal Exchange, adjusted for US CPI. 1983 dollars per metric ton.

Figure 4
Aluminum Prices Adjusted for Inflation

The market for primary steel shows a similar pattern to aluminum. Again, the U.S. share of world steel production peaked in 1945 and has fallen steadily ever since. In the case of steel production; however, the U.S. share stabilized between 1980 and 1999 at about 10 percent, and then fell after that. In volume terms, steel production in America is about the same as it was after World War II, although it is down by 42 percent from its peak year in 1973.[13]

While steel production has not fallen to the same extent as primary aluminum production, the market has changed considerably since the Second World War. Famous names in the industry have contracted or declared bankruptcy. Giant steel works operated by companies like Bethlehem Steel, United States Steel, Republic Steel, and Inland Steel have been replaced by so-called mini-mills, so instead of converting iron ore into steel in blast furnaces, most production in the United States uses scrap as a feedstock. Today, most of the large steel producers in America are operated by large international producers like ArcelorMittal and Gerdau, with the largest American owned producer (Nucor) producing only using mini-mills.

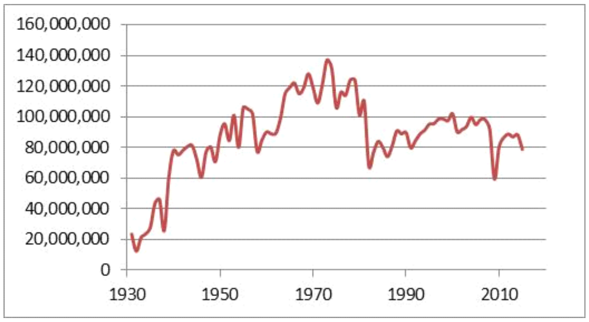
Figure 5
US Share of Worldwide Raw Steel Production



[13] USGS, 2015 is the latest year available.

Just as with primary aluminum production, the reduction in blast furnace operations in America is not mainly due to low prices caused by overproduction, but rather by bourgeoning environmental regulations.[14] Looking at production levels over time, past trade protections designed to help the industry have had the reverse effect, essentially leading to reductions in investment in new technology and innovation.[15]

Figure 6
US Steel Production



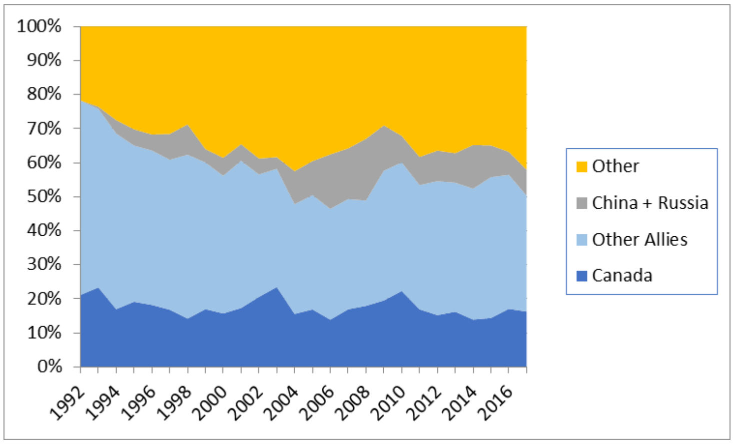
The changes to the market have led to a greater share of steel demand in the U.S. being met by production in other countries, however, as data from the DOC shows, the vast majority of the imports (at least in terms of dollars) come from countries that are treaty allies, including Canada and the other NATO countries such as Japan, South Korea, and Australia. Taken together these countries provide over 50 percent of all U.S. imports of steel. Countries that would be questionable suppliers in the case of military necessity (namely China and Russia) currently account for only 8 percent of overall imports, and except for the late 2000s when American domestic production was nearly 100 million tons, never accounted for more than 18 percent of imports.[16]

[14] For example, the 1990 Clean Air Act Amendments were estimated to have cost American steel producers $17 per ton in production costs, which was equivalent to a 5 percent cost increase at that time. See: Joshi, Satish, et., al., *Estimating the Hidden Costs of Environmental Regulation*, The Accounting Review, April 2001. On-line at: https://msu.edu/user/satish/TAR-Steel-pdf.pdf

[15] The steel industry suffered significant reductions in demand in the early 1980s due to both recession, a switch to alternative materials and in because more steel was imported in the form of manufactured products. Higher prices in the US led to the use of alternative materials, and steel consumers moved their factories overseas to take advantage of lower prices. In addition, large integrated producers were not forced to deal with their labor issues, or to invest in new technologies because their market (and profits) were protected. Rather than helping the industry in the long run, protection resulted in a less competitive integrated steel sector. See: Tarr, David, The Steel Crisis in the United States and the European Community: Causes and Adjustments in, Baldwin, Robert, et. al., Issues in US-EC Trade Relations, University of Chicago Press, 1988.

[16] Import value (customs value) from *USA Trade Online*, US Department of Commerce, Bureau of the Census, On-line at: https://usatrade.census.gov/.

Figure 7
Sources of U.S. Steel Imports



Aluminum Use in Beverage Cans:

Aluminum is an extremely important input component for the beverage can industry. In fact, nearly 100 percent of all cans used in the United States to package beer, soft drinks, single serve juices, and other beverages are made from 100 percent aluminum. Were the United States to impose a tariff of 10 percent on the price of imported aluminum, this tax would be passed through the production process from can sheet makers, to can producers, to beverage producers, and likely, to consumers. Just as with excise taxes imposed on alcohol and tobacco to reduce consumption, tariffs, which are simply a tax, reduce consumption of the goods on which they are imposed.

The process of making aluminum beverage cans[17] begins with both imported and domestic primary aluminum ingot and aluminum scrap (nearly all of which is domestic) rolled into aluminum sheet. According to the Aluminum Association, the manufacture of aluminum sheet used to manufacture everything from cans and packages, to automobile bodies and tractor trailers, to appliances and building materials is the most common use of primary aluminum.[18]

[17] The term "aluminum beverage cans" includes beverage bottles made from aluminum.

[18] See *Sheet & Plate: Quick Read*, The Aluminum Association, at: http://www.aluminum.org/industries/processing/sheet-plate

Figure 8
Production (Input) Costs for Aluminum Sheet

Input	Percent of Cost of Sheet
Aluminum	55.3%
Capital Expense	5.8%
Labor and Proprietor Income	10.6%
Other Manufactured Products	4.4%
Other Services	7.2%
Wholesaling	8.1%
Steel and Other Metals	2.1%
Chemicals and Resins	0.2%
Transportation	3.9%
Energy	1.8%
Production Taxes	0.5%
Other	0.1%
Total	100.0%

Aluminum sheet is produced from heated primary aluminum ingots and scrap aluminum which is rolled back and forth in a mill to produce large aluminum slabs. The metal is heated and cooled, and alloys are added depending on the final product and use. The slabs are then rolled through a continuous mill to reduce thickness and wound into a coil at the end of the line. These coils are subsequently cold rolled, from one to several passes at cold rolling mills. Coils may be heated in a furnace to soften it for further cold rolling or produce the desired mechanical properties. Some aluminum sheet and foil products may also be produced using the continuous casting process in which molten metal enters the caster, which produces a hot rolled coil, thus bypassing the ingot casting and hot rolling steps.[19]

To determine how the cost of aluminum translates into the cost of can sheet, data on the intermediate expenditures for goods and services used in the production process for *aluminum sheets, plates, and foils* is obtained from the input output model of the United State Economy. Data on over 500 different goods and services is available from IMPLAN, Inc.[20] IMPLAN was first developed in the late 1970s and is based on models developed by the US Forest Service.[21] In 1985, the responsibility for developing IMPLAN data sets shifted to the University of Minnesota. As demand grew for regional models by non-USFS organizations, IMPLAN (then Minnesota IMPLAN Group (MIG, Inc.)) was established as an independent corporation for the purpose of developing and selling all future iterations of the IMPLAN database and software. IMPLAN's production functions are based on the Benchmark I/O Tables, which

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[19] Excerpted from op. cit. *Sheet & Plate: Quick Read.*

[20] The analysis utilizes the latest IMPLAN model (2016 input/output accounts.) The model adopts an accounting framework through which the relationships between different inputs and outputs across industries and sectors are computed. This model can show the impact of a given economic decision – such as a factory opening or operating a sports facility – on a pre-defined, geographic region. The IMPLAN model is based on a series of national input-output accounts known as RIMS II. These data are developed and maintained by the U.S. Department of Commerce, Bureau of Economic Analysis as a policy and economic decision analysis tool.

[21] In 1976, the National Forest Management Act required the United States Forest Service (USFS) to cultivate a 5-year management plan which presented both alternative land management strategies and their potential resource outputs and socioeconomic effects on local communities. In cooperation with the Federal Emergency Management Agency (FEMA), the USFS played a role in the creation of two linear programming models: FORPLAN and IMPLAN. FORPLAN (short for "forest planning") estimated the resource outputs of land management strategies, and IMPLAN (short for "impact analysis for planning") estimated the economic effects of those resource outputs on local communities. The USFS officially began modeling economic impacts with IMPLAN in 1978 and still does so to this day.

are produced by the U.S. Department of Commerce, Bureau of Economic Analysis.[22] Figure 8 outlines the input costs for aluminum sheet.

As the data show, the major input cost for producing the aluminum sheet that goes into cans is raw aluminum. This accounts for about 50 percent of the final cost of the can sheet to the beverage can manufacturer. Other major costs include transportation, labor and wholesaling/warehousing expenses.

The aluminum used to produce can stock comes either from domestic or international sources. The process of transporting and wholesaling the aluminum scrap from recyclers, or ingot from primary smelters or from abroad, adds costs to the raw aluminum even before it hits the can manufacturing process. These prices are standardized in the United States, with the price of raw aluminum ingot (either imported or domestic) set by traders on the London Metals Exchange (LME).[23] The price of scrap aluminum, which is nearly all domestically sourced, averages 80 percent of the LME price.[24] On top of this, there is an added cost of delivering aluminum to the mill. For most products these transportation and wholesaling margins were last calculated by the DOC in 2007.[25] However, in the case of aluminum, a third-party company, Platts, sets the North American aluminum transaction price, also known as the Midwest Premium.[26] Platts's MW U.S. Aluminum Transaction price assessment has been a benchmark for 30 years in the North American aluminum market. The assessment reflects the spot physical value of 99.7 percent P1020 high-grade aluminum, in ingots, sows or T-bars, delivered, duty-paid plants in the U.S. Midwest. The premium or discount portion of the Transaction price reflects not only out-loading and delivery costs to consuming plants, but also the state of supply and demand in North America. Factors such as interest rates and the ability to finance aluminum on exchange futures price curves have also historically played a role in the level of the premium. Tariffs are also factored into the Midwest Premium, which means that it will rise if there is a tariff. As of January 2018, the Midwest Premium was 10.78-cents per pound, meaning that the margin was about 12 percent. This is almost equal to the DOC margins which together equal 12.7 percent. As of March 2, 2018, and on rumors of tariffs, the Midwest Premium was up to 17.5-cents per pound.[27] Imposition of an actual tariff will only cause further increases.

Scrap in increasing percentages is also used to manufacture can sheet.[28] While aluminum scrap is nearly all domestic product it is expected that the price will rise such that the current price differential of about 20 percent will be maintained following the imposition of a tariff. Taking the weighted average (scrap plus primary) price of the aluminum, currently can sheet manufacturers pay about 97-cents a pound for feedstock. Under a 10 percent tariff, this would rise to nearly $1.051 per pound, an increase of 8.9 percent in price.[29]

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[22] From this, IMPLAN derives current industry output, value-added, and final demands. Multiplying the current industry output through the absorption matrix creates a first approximation of the current USE matrix (i.e., current production functions). An iterative process is then used to adjust the columns of the USE matrix to equal Industry Output - Value Added (columns) and the rows to equal the Commodity Output - Final Demand. Beginning with 2007, the benchmark input-output tables are fully integrated with the annual industry accounts and the national income and product accounts.

[23] The London Metal Exchange is the world center for the trading of industrial metals – the majority of all non-ferrous metal futures business is transacted on our platforms. In 2017 this equated to $12.7 trillion, 3.5 billion tons and over 157 million lots

[24] Conversation with Tim Weiner, Senior Global Commodities Risk Manager, Molson Coors Brewing Company. February 7, 2018.

[25] Markups from: *Margins After Redefinitions: 2007 Detail*, Industry Economic Accounts Directorate, Bureau of Economic Analysis (BEA), U.S. Department of Commerce.

[26] https://www.platts.com/price-assessments/metals/aluminum-transaction.

[27] Conversation with Tim Weiner, Senior Global Commodities Risk Manager, Molson Coors Brewing Company. March 3, 2018.

[28] Only about 7.8 percent of scrap is imported). See: *The Aluminum Can Advantage*, The Aluminum Association, at: http://www.aluminum.org/aluminum-can-advantage. Import percentages from 2017 through November. *Aluminum Situation*, the Aluminum Association, January 2018

[29] The weighted average price of aluminum is equal to the base LME price of $1.105 per pound multiplied by 30 percent and the scrap price which is equivalent to 80 percent of the LME price or $0.884 per pound multiplied by 70 percent. The result is $0.864 per pound. To this is added the Midwest Premium, which is currently 17.5-cents per pound.

The price of the sheet is calculated by dividing the raw aluminum price by its share of the production cost. Based on the IMPLAN database, this is 55.3 percent. Keeping this margin constant, and applying a transportation cost margin of 0.118, the price of can sheet would rise from a current level of approximately $1.789 per pound to $1.948[30], or about 0.5-cents per can equivalent.[31]

Once aluminum can sheet is produced by a rolling mill it is sold to a can manufacturer. Unfortunately, even though aluminum and steel cans tend to be manufactured at different places, the data from IMPLAN is aggregated. According to the IMPLAN databases, 79.5 percent of the production cost of metal cans in the United States is the result of either commodity or service inputs. The most important of these are aluminum products (NAICS Code 331313, 331315 and 331318) which together account for 45 percent of the production of metal cans. Every production function includes the consumption of the commodity itself (as manufacturers purchase from each other). In this case, purchased cans account for about 5.6 percent of output, so the adjusted percentage of aluminum used in the production of cans is slightly higher (50.3 percent).[32] In other words, for every dollar in cans produced in the U.S., 50.3-cents is due to the cost of aluminum in some form. The significant cost for aluminum over steel and other metals in can production is due to the fact that about 81 percent of all cans produced in America are aluminum food or beverage cans.[33] Steel has been replaced over time and today all beverage cans produced in the U.S. are made of aluminum.[34]

Since the beer industry uses aluminum, not steel, beverage cans, the IMPLAN database is separated into component parts based on the overall production volume of metal cans. According to the Can Manufacturers Institute, there are roughly 88.5 billion aluminum beverage cans and 31.5 billion steel food cans produced annually in the United States. This means that 73.8 percent of the cans are aluminum and 26.2 percent are made from steel.

The IMPLAN input output models were split into two pieces based on both these market shares and a different production function where the aluminum inputs are assigned to beverage cans and the steel and alloy inputs assigned to food cans. Based on these changes, the component parts of a can used in this analysis are shown in Figure 9.

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[30] Companies will not simply pass the tariff through without markups. The higher cost of aluminum leads to higher costs across the board, including higher capital costs, higher insurance costs, higher warehousing costs and higher transportation costs. As with beer excise taxes, historically companies pass through these costs inclusive of margins.

[31] This assumes that 34.09 beverage cans are produced for every pound of aluminum

[32] Based on the 2016 IMPLAN tables.

[33] Conversation with Sean Reilly, consultant to the CMI, February 1, 2018. Of the approximately 125 billion cans produced in the United States (includes beverage cans produced in Canada) last year, 101 billion were aluminum cans.

[34] This transition occurred in the 1970s and 1980s. Hosford, William F. and John L. Duncan, *The Aluminum Beverage Can*, Scientific American, September 1994, at: http://www.chymist.com/Aluminum%20can.pdf.

Figure 9
Component Part of Beverage and Food Cans

Beverage Cans	
Input	Percent of Cost of A Can
Aluminum	50.3%
Capital Expense	12.4%
Labor and Proprietor Income	10.0%
Other Products	8.3%
Other Services	12.0%
Energy	1.4%
Prodution Taxes	0.6%
All Other	4.9%
Total	100.0%

Food Cans	
Input	Percent of Cost of A Can
Steel/Metals	35.9%
Capital Expense	12.4%
Labor and Proprietor Income	10.0%
Other Products	9.1%
Other Services	27.6%
Energy	3.3%
Prodution Taxes	0.6%
All Other	1.1%
Total	100.0%

Focusing solely on aluminum beverage cans, over 50 percent of the overall cost of a can is the result of the purchase of aluminum. Using the same formulaic process as with raw aluminum, the price of can sheet is divided by this margin and adding the transportation margin of 2.3 percent provides an estimated cost of $3.63 per pound equivalent of beverage cans, or about 10.7-cents per can to the brewer.[35]

When the 10 percent tariff is passed through to the can manufacturer, assuming all margins remain constant, the price for a pound equivalent of cans increases to $3.96, or about 11.6-cents per can.

Aluminum in the Beer Industry:

Aluminum is an important component of beer, since 56.3 percent of all beer sold in America is canned in aluminum beverage containers.[36] According to the IMPLAN database, about 10.6 percent of the production cost of beer (including beer packaged in cans, glass, kegs, plastic, growlers, etc.) is due to the purchase of metal cans by brewers. Adjusting this to account for the changes in the can models this increases to 11.4 percent. In turn, as was stated above, about 50.3 percent of the cost of these cans comes from the aluminum materials used to produce them. Combining these two figures, 5.7 percent of the cost of beer is the direct result of aluminum purchased to produce cans. To put this into perspective, 9.7 percent of the cost of producing beer is from grain, and 12.5 percent is due to the purchase of cartons, bottles and other packaging materials. Unlike soft drink producers, brewers cannot easily convert to plastic or glass containers due to both consumer preferences and capacity constraints in the production process.

This means that for every dollar worth of beer produced in the United States, brewers spend about a dime for cans, of which roughly 5-cents is for aluminum. While this does not seem like a lot, it must be remembered that brewers currently use over 36 billion cans[37] to produce over $55 billion worth of beer annually.[38]

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[35] Based on 34.09 beverage cans per pound as per the Can Manufacturer's Institute. 2018.

[36] Through the 2nd Quarter of 2017. This figure represents the entire beer industry, including major imports. Large domestic brewers package a larger share in cans. Based on conversation with Michael Uhrich, Chief Economist, Beer Institute, February 2, 2018. 2017 data are not yet published. Note that these are exclusively aluminum cans.

[37] Can Manufacturers Institute, 2018.

[38] Based on the IMPLAN figures. The Bureau of Economic Analysis reports beer production of $34.9 billion (Economic Accounts Directorate, Bureau of Economic Analysis (BEA), U.S. Department of Commerce, *Gross-Domestic-Product-(GDP)-by-Industry Data* on-line at: www.bea.gov/industry/gdpbyind_data.htm) and the Census of Manufacturers for 2016 reports beer sales of $31.2 billion (US Department of Commerce, Bureau of the Census, *2016 Annual Survey of Manufactures*, online at: www.census.gov/data/tables/2016/econ/asm/2016-asm.html)

Figure 10
Brewers' Production (Input) Costs for Beer

Input	Percent of Cost of A Beer
Cans	11.4%
Production Taxes	13.3%
Capital Expense	12.9%
Labor and Proprietor Income	11.5%
Other Packaging	12.2%
Grains	9.7%
Transportation	3.4%
Energy	1.7%
Other Products	2.2%
Other Services	17.4%
All Other	4.3%
Total	100.0%

Production taxes consist mainly of federal excise taxes, customs duties, and severance taxes.

Based on these figures, and using the same process as before, the brewing industry purchases a pound equivalent worth of cans for $3.63, or roughly 10.7-cents per can. As Figure 11 below shows, the brewing industry purchases roughly $5.0 billion worth of cans, containing roughly $2.7 billion worth of aluminum. Dividing this by the can percentage of beer production costs provides an estimate of $31.88 for 34.09 cans of beer or about 93.5-cents per can ($300 per barrel). According to the economic impact analysis of the beer industry, the average production cost for beer was $266 per barrel[39] suggesting that the model does slightly overestimate the final product cost; however, considering the nature of the model, and the fact that beer wholesaling and retailing margins have not been added in yet, the 16 percent difference is likely not material. In addition, the model suggests that the can component of a beer is approximately 12-cents which is well within the margin of error that one might expect when comparing a modeled result to an industry rule of thumb (of about 10 or 11-cents per can).

We strongly believe that the government sources grossly underestimate beer production, as well as the production of most manufactured goods. Most of the Census figures are based on surveys of large firms, and do not tend to capture production by smaller firms. Our own model suggests that output by the brewing industry is actually over $55 billion. See: *A Study of The U. S. Beer Industry's Economic Contribution In 2016,* Prepared for The Beer Institute and National Beer Wholesalers Association by John Dunham & Associates, May 2017. This is the ex-dock price of beer exclusive of all taxes.

[39] *A Study of The U. S. Beer Industry's Economic Contribution In 2016,* Prepared for The Beer Institute and National Beer Wholesalers Association by John Dunham & Associates, May 2017.

Figure 11
Value of Aluminum for Beer Cans

		Current		Post Tariff
Total Beer Production (2016)	$	55,088,111,400	$	53,806,980,576
Cans Purchased ($)	$	4,995,837,062	$	5,313,482,743
Cans Per Dollar		9.38		8.61
Raw Aluminum Per Can	$	0.0585	$	0.0643
Total Aluminum	$	2,739,002,762	$	2,942,834,872
Total Aluminum Pounds		1,374,598,280		1,342,630,580

Following the inclusion of the tariff, and marking everything up at current margins, the price of 34.09 cans of beer will increase to $32.20, which is about a penny per beer. Again, the beer industry uses 36 billion aluminum cans annually. Moreover, the likely price increase does not stop here.

According to the DOC, the transportation margin on beer is 3.6 percent, the wholesale margin is 57.4 percent and the retail margin (which can include the up to 400 percent markup at some on-premise establishments) is 27.3 percent.

Applying these margins brings the current retail price of a pound of aluminum's worth of beer to $66.17, or $1.94 per beer, and the after-tariff price to $66.85 ($1.96 per beer). This makes the actual increased cost of the can at retail to 2-cents. It bears repeating that the beer industry uses 36 billion aluminum cans annually. It also bears note that brewers and beer importers do not set the retail price of their products; retailers control retail pricing.

As Figure 11 above shows, higher prices lead to fewer cans per dollar, and incidentally less aluminum purchases. Overall can sales are expected to decrease by nearly 1 percent owing to both substitution and lower sales in general. This will result in a subsequent 1 percent reduction in aluminum use by the beer industry, even though the direct cost to the industry of aluminum alone will increase by 9 percent or about $246.6 million. There are other costs that brewers will also see rise due to higher aluminum beverage can prices. For example, financial carrying charges will increase, so will insurance costs, metals brokerage charges and even warehousing costs (it is generally more expensive to store more valuable products). All told, the industry will see an increase of about $347.7 million following the imposition of a 10 percent tariff on aluminum.

The Economic Impact of a Potential Tariff on Aluminum on The Beer Industry:

Marginal changes to the price of canned beer can have sizeable volume impacts at retail. Consumers may react by selecting lower priced products, and by reducing overall purchases. They may also change their beverage alcohol choices. Some imported beer may avoid the tariff, at least in part, making it potentially more attractive to consumers. Consumers may also shift to other substitute goods, particularly wine and spirits which, as bottled products, would not be subject to the effects of the tariff.

Since beer is what economists call a "normal good," increases in prices, even at the margin, reduce volume sales. Loss of volume sales will result in less need for brewery production workers, wholesale warehouse workers and truck drivers, and particularly retail staff including waiters and waitresses, retail clerks and even concession workers at athletic events. As Figure 12 below shows, most of those lost jobs from a tariff on the aluminum used for beer cans would be in retailing (restaurants, package stores, grocery stores, etc.) as sales revenues and tips fall at these establishments. These changes are based on an expected reduction in sales of about 0.9 percent as calculated internally in the models.[40]

These lost sales would result in significantly fewer jobs in the beer industry. Based on models developed for the Beer Institute, as many as 20,300 American jobs could be lost as a result of high tariffs on aluminum. The losses in the beer industry alone could cost the country nearly $2.5 billion in economic activity and would ultimately cost the Federal government over $275.1 million in lost tax revenue.

Figure 12
Overall Economic Impact of Potential Aluminum Tariff on Beer Industry Employment

	Jobs	Wages	Economic Output
Brewing	(590)	($47,073,000)	($502,341,000)
Wholesaling	(1,251)	($84,661,000)	($223,059,000)
Retailing	(8,247)	($223,660,000)	($481,036,000)
Beer Direct	(10,089)		
Supplier	(4,494)	($289,927,000)	($1,051,511,000)
Induced	(5,707)	($293,719,000)	($948,415,000)
Total	(20,291)	($583,646,000)	($2,480,962,000)

Change in Federal Taxes	($275,148,000)
Change in State Taxes	($277,386,000)

Conclusions:

Rather than benefitting the American economy, the imposition of a 10 percent tariff on imported aluminum will lead to higher prices and lower demand for goods and services produced by U.S. manufacturers.

Higher prices will result in lower sales, which in turn will cost the American economy as many as 20,300 beer industry-related jobs because of tariffs on aluminum. The losses in the beer industry alone could cost the country nearly $2.5 billion in economic activity and would ultimately cost the Federal government over $275.1 million in tax revenues.[41]

In addition, the reduction in sales will reduce the demand for aluminum – both imported and domestic. Research has shown that past trade protections designed to help industries have had the reverse effect, essentially leading to reductions in investment in new technology and innovation.

Rather than impose new taxes and regulations to stimulate basic metals production in America, the Trump Administration should consider removing or revising the regulations that have led to high U.S. energy costs that have, in turn, encouraged aluminum producers to shift operations to other countries like Canada and the UAE.

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[40] Based on a comprehensive interstate demand model developed for MillerCoors by John Dunham & Associates. This is the average elasticity for the 10 percent tariff assumption. This model has been used for over 20-years to calculate volume changes due to changes in tax increases.

[41] Not including revenues generated by the tariff.

Disclaimer

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