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Section 232 measures on imported steel are playing a vital role in the U.S. steel industry, particularly in its stabilization and revitalization. After decades of decline amid a mounting overcapacity crisis in global steel markets, the result of state-led policies driving overinvestment in foreign steel production, the Sec. 232 measures have helped the industry regain its footing, achieve economic margins to remain financially viable, and restored market expectations to elicit reinvestment, expansion, and job creation in the industry.

Absent other feasible policy options to address the glaring market failures in global trade through multilateral agreement, they remain a critical tool to support ongoing industrial rebuilding and to ensure that these industries, essential for national and economic security, have the necessary resources for technological investments to meet the security challenges of the future, including decarbonization. The analysis presented in this submission shows that these tariffs are working to resuscitate America's industrial base and to elicit critical new investments. Further, they are doing so with no meaningful or statistically measurable adverse impacts on broader prices in steel-using industries or consumer prices more generally.[i] I first briefly summarize my main points here, followed by details elaborating each point in the remainder of this brief.

1. **Sec. 232 measures prioritize national and economic security concerns over efficiency and consumer welfare goals.** There is no question that the ongoing economic viability of U.S. steel production remains at threat due to global supply gluts. The Department of Commerce identifies an 80% capacity utilization rate (or higher) in steel production over the business cycle as a minimum threshold for long-term financial viability of the domestic industry.[ii] In the business cycle prior to the 232 tariffs, U.S. steelmakers reached this level of activity less than 5% of the time. From implementation of Sec. 232 measures to the start of the pandemic, U.S. steelmakers reached that operating threshold 79% of the time and gave producers greater resiliency to weather pandemic economic disruptions.[iii] The Section 232 measures afforded steel producers the financial breathing space to start rebuilding the industry with expanded investment and job creation. The unprovoked Russian invasion of Ukraine and growing tensions across the Taiwan straits underscore the security imperatives for policymakers to weigh in evaluating Sec. 232 steel measures.

2. **A vibrant domestic steel industry is also critical for responding to the emerging security threat of climate change.** Steel will provide the foundation on which the green transformation will be built as we reinvest in energy production and transportation infrastructure, and construction and retro-fitting of less carbon-intensive residential and commercial buildings, delivering a more resilient, efficient, competitive, and sustainable U.S. economy. These investments will require large

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quantities of steel and—for national and economic security and environmental concerns, U.S.-based producers, who are already greener and than the leading foreign producers—to manufacture it. In order to serve these needs and to decarbonize production in the steel itself will require continuing substantial investments over several decades to develop and deploy green technologies in upstream mineral extraction and processing and metals recycling, to steel production, and in transporting steel goods to their final users.

Decarbonizing the global steel industry is estimated to require a cumulative $278 billion of investment through 2050; decarbonizing the energy systems on which steel producers will rely require substantial additional investments and industry participants will need to make choices from a menu of potential (possibly path-dependent) technologies with uncertain futures.[iv] The marketplace is likely to demand carbon-neutral steel well before 2050, and research and development investments with long-term yields need to be prioritized now to meet future targets. Analysts estimate that U.S. flat-rolled steel producers alone will need to invest $25 billion in new facilities over the next 8 years to maintain the industry's greenhouse gas reduction targets.[v] Maintaining a financially sustainable and re-nascent U.S. steel industry will be critical to ensuring that industry has the necessary resources and long-term expectations needed to make such investments.

3. In the absence of a multilateral resolution to global steel market distortions or a comprehensive industrial strategy, the U.S. steel industry will remain on precarious footing. Foreign, state-backed producers making some of the world's most polluting and carbon-intensive steel, have continued expanding capacity through the first two years of the pandemic, adding 116.4 MMT, or 5%, to global production capacity in 2021 relative to before the pandemic—at a time of lagging, volatile demand. This includes producers in China, India, Middle Eastern states, and ASEAN countries. New investment in ASEAN countries alone amounted to more than 76% of the increase in world capacity since the "Great Lockdown" recession. Rapid expansion there largely reflects the effects of trade diversion from Chinese steel firms that acquire or establish greenfield foreign investments in third countries with more favorable tariff rates for their exported steel content. Strong enforcement of U.S. antidumping and countervailing duty laws provides badly needed relief from these challenges. But Sec. 232 tariffs and quotas also offset some of the headwinds from expanding foreign capacity: the U.S. steel industry has added 7.7 MMT of production capacity since Sec. 232 relief was imposed—a notable reversal of fortunes, but still at risk of being dwarfed by the non-commercial forces that dominate global market trends.

4. The Sec. 232 tariffs have had no economically significant impact on prices for the leading steel-using industries or consumer price inflation more broadly. Econometric analysis presented here finds that changes in the price for steel inputs have zero significant causal impact on the prices of most steel-using goods, or on broader consumer price inflation. There are some categories of goods for which the analysis does find a causal price effect: electrical equipment and household appliances, and food consumed at home. In each case, however statistically significant, the real-world impact remained economically trivial, amounting to a maximum one-time price response of just 0.03% and 0.05%, respectively, in the downstream goods. In any event, price growth for iron and steel products slowed 14-fold in the nearly two years with Sec. 232 measures up to the pandemic. Any initial price impact of the Sec. 232 steel, no matter how small, has long dissipated into global markets.

The lack of measurable ongoing impacts of Sec. 232 measures on the broader economy should not be surprising. First, steel is an intermediate industrial input, but even in the most steel-intensive industries it amounts to a small fraction of costs in longer production value chains. Second, following Sec. 232 implementation, Chinese policymakers depreciated their currency 15 percent, making *all* their exports to the United States cheaper in dollar terms, and effectively blunting the impact of tariffs on U.S. imports—including for those covered under Sec. 301 tariffs. Third, the measures themselves, while still having positive impacts, proved more porous than anticipated, with the Department of Commerce granting nearly 224,000 exclusions to U.S. steel importers, equivalent to roughly 88 MMT per year.

Shifting overall consumption from services into goods since the start of the pandemic shows that any such statistically noticeable price changes did not dampen consumer enthusiasm for buying goods. But it also demonstrates that neither was the current bout of high inflation caused by Sec. 232 tariffs, nor would eliminating them have any meaningful impact on dampening or even offsetting current inflation. On the high end, one could expect a one-time nominal price decrease of 0.2% as a result of eliminating *all* tariffs—not just the Sec. 232 and Sec. 301 tariffs—right now. On the low end, one might expect no noticeable change in overall prices from eliminating tariffs, as any gains from change will be swallowed up disproportionately by corporate profits given the extent of concentrated market power in global supply chains. But even the high end would just be a drop in the bucket: on average, every month since January 2021, nominal consumer prices have risen by more than three times as much. The impact would not be negligible on the price of things for which families are hurting most: food, housing, and gas and energy.

Even if we imagined supply chains would adjust frictionlessly from eliminating all these tariffs now, we can still conclude it will do nothing to bend the current inflationary trend. In fact, it is likely to increase the reliance of U.S. economy on vulnerable global supply chains. And it must be pointed out that any price effects from changing tariffs are certain to pass through less than 100% to end users. Given current conditions of market concentration in global supply chains, it is likely that potential gains will be soaked up by rising corporate profits in importing industries.

5. The near-term macroeconomic outlook provides no source of relief from the long-term pressures weighing on the U.S. steel industry. A global economic slowdown is in the works, given the war in Ukraine, economic disruptions from China's Zero-Covid policies, and the U.S. fiscal contraction and monetary tightening. Though it may do little to slow the dominant sources of inflation, the Federal Reserve's monetary policy tightening cycle will further slow the U.S. economy and cause an appreciation of the dollar, thereby making imports relatively more appealing, and U.S. exports more expensive for foreign buyers. Rising rates and dollar appreciation, in turn, will tighten financial constraints on developing and emerging market countries, putting the squeeze on potential foreign sources of growth. All this points to depressed near-term expectations of the demand for steel. In a market operating on commercial terms, these conditions would induce producers to refrain from investing in net new capacity. Yet, as I show in the next section, global overcapacity, driven by non-commercial factors, remains a material threat to U.S. steel production.

6. Chronic global overcapacity threatens U.S. steel industry

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Over the past several decades, chronic conditions of oversupply have come to define global steel markets—there is significantly more capacity to produce steel than there is demand for steel around the world. This chronic excess capacity is a direct result of policies pursued in many countries to support domestic steel producers on anti-competitive terms, with negative consequences for producers elsewhere around the world. It is also due to the basic economics of production in highly capital-intensive industries like steel, in which firms must maintain high levels of production capabilities in order to be economically viable.

Surplus capacity puts downward pressure on prices for steel products, squeezing producer profit margins to an extent that threatens the ability of firms to service debts; to invest in research and development in more advanced products and cleaner production technology; to maintain workers' jobs, compensation, and retiree pensions; and even to remain financially solvent. Businesses incur both fixed costs and variable costs in the course of steel production. Variable costs change with the quantity a firm produces, whereas fixed costs must be incurred no matter how much a firm produces. For example, in the case of steel, variable costs include the cost of material inputs like iron ore, scrap, and coal, as well as electricity and compensation for workers. However, capital-intensive industries like steel face enormous fixed costs for investments in production facilities and equipment that dominate total costs of production.[vi]

The capital intensity of steel production has several economic consequences that contradict textbook economic models of production and competition. First, in industries like steel, the capital-intensive nature of production means that producers face increasing returns to scale—the more raw steel that is produced, the more efficient it is to produce additional output—such that the minimum efficiency of scale for entering the market with competitive costs is so large as to create a nontrivial addition to industrywide capacity.[vii] That is, in order to be viable, steelmakers must maintain large production capacity and, when expanding capacity, must add capacity in large chunks.

Second, because fixed costs of production far outweigh variable costs, it is almost always desirable for producers to operate near full capacity in order to minimize the average cost of production. For producers in many countries, production exceeds what can be consumed in domestic markets, and the excess must be disposed of through exports. The U.S., however, is rare among industrial countries in producing less steel than domestic economic needs demand.

Finally, the capital invested in fixed assets is quite specific, meaning the equipment cannot be easily redeployed to other uses outside of steel production, or even to produce alternative lines of steel products—particularly for flat-rolled—as is typically assumed in textbook models of economic competition. This means that, typically, productive capacity of financially nonviable steel producers is not removed from the market, but rather acquired by other producers in better financial standing.

Thus, the market mechanism of price competition and creative destruction does not work well to self-regulate excess capacity in the industry. In fact, the OECD finds that foreign governments maintain policies and implement barriers that prevent the contraction of steelmaking capacity during economic downturns.[viii] Combined, these features of the steel industry create incentives for producers to build big and run hot, no matter what other producers in the market do. But when all

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producers follow this logic, the result, in aggregate, is chronic overinvestment in productive capacity.

In order to maintain the viability of national steel industries under such financial conditions, many countries have instituted policies designed to maintain and expand production on noncommercial terms or other policies impermissible under international trade rules like the World Trade Organization (WTO)'s Agreement on Subsidies and Countervailing Measures. Commerce and the U.S. International Trade Commission regularly find such measures do significant material harm to U.S. producers operating on a commercial basis.[ix] At the time of the Sec. 232 report, Commerce had authorized 164 orders on steel imports for illegal dumping or trade-distorting subsidies by 40 countries, with another 20 ongoing investigations.[x] It is vital that these orders remain in place, and that the United States continues strict enforcement of its antidumping and countervailing duty laws. However, some foreign producers also benefit from other policies favorable to domestic industries but not explicitly prohibited by international agreements, such as discretionary regulatory forbearance of environmental standards.

Despite decades of multilateral diplomatic efforts to rein in excess capacity, capacity for global steel production continues to substantially exceed global demand for steel products, as shown in Figure A. In 2000, the peak year before a recession and the year before China acceded to the WTO, global excess capacity of 282 million metric tons already exceeded production by one-third of total output (850 MMT). With surplus capacity already at substantial levels, capacity growth outstripped steel production growth for the next decade and a half. From 2000 to 2015, production volume increased by 91% to 1,625 MMT, while excess capacity grew 166% to 752 MMT.

By the mid-2010s, total world production capacity stabilized near 2,400 MMT, and increased demand for steel products led production to increase and capacity utilization rates to rise. However, by 2017 excess capacity still remained high, at 616 MMT, and capacity utilization remained below the level in 2000. Only beginning in 2018 and 2019, coinciding with Sec. 232 measures, did world capacity utilization surpass the level in 2000 as demand growth outpaced supply growth. The global economic slowdown beginning with the "Great Lockdown" in 2020 disrupted this progress. In 2021 the world steel capacity utilization recovered to 79 percent. Still, in 2021, global surplus capacity amounted to 527 MMT, or nearly 4.5 times the entire U.S. production capacity.

That world production capacity stabilized after 2014 belies significant changes in the composition of steel production capacity by country. Figure B illustrates these changes in the composition of global steel supply by plotting the production capacities of the world's largest steel-producing countries and country groups in 2000 on the horizontal axis against the percentage change in steel capacities in these country and country groups from 2000 to 2021 on the vertical axis. The size of each bubble indicates each country's relative share of capacity in the global steel market in 2021. China, the world's largest steel producer, expanded production capacity by 423% since 2000, such that by 2021 it controlled just shy of half of global steel capacity.

Just the additional capacity installed in China since 2000 exceeds the combined capacity in 2021 of all other individual countries depicted in Figure B. Although Chinese producers are the largest drivers of chronic excess steel capacity, they are far from alone in aggressive expansions that have

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displaced other producers and reshuffled the structure of world production. On net over this period, U.S. capacity added just 2 MMT, and its global market share was cut in half to less than 5% in 2021 from 10% of world capacity in 2000.

Figure B also shows the rapid growth in steel production in China's ASEAN neighbors as well as in Indian and Middle Eastern producers. In 2019, ASEAN producers accounted for 62 MMT of global steel capacity, but by 2021 had mushroomed in capacity to 151 MMT, a 144% expansion in just two years. ASEAN's rapid expansion of steel production largely reflects the trade diversion effect where Chinese producers are engaged in, essentially, the real goods trade equivalent of a money laundering scheme to re-route hard-to-trace domestic commodity steel products through third countries. Through a spate of overseas acquisitions, joint venture partnerships, and greenfield direct investments, China's outward movement to expand steel production regionally provides a platform for tariff evasion through transshipment, opportunities for trade mis-invoicing, and sometimes performing the trivially minimal transformation to qualify under a different HS code, in sum gaining preferable access to U.S. markets while continuing to support China's domestic steel base.[xi]

Elsewhere, Figure B shows that Middle Eastern, Indian, Latin American, and former Soviet Commonwealth of Independent States producers are also rapidly expanding steel capacity. Middle Eastern steel producers expanded steel capacity by 455%, while Indian producers expanded 327%, Latin American producers expanded 49%, and CIS producers expanded 21%. Each of these feature state-dominated or state-directed economies, trade-distorting government policies supporting steel producers, or a history of shipping unfairly traded steel products to the U.S. market. In total, they now amount to one-fifth of global steel production.

Clearly multilateral solution to the chronic problem of global excess steel capacity remains essential. But with the inability of negotiations or multilateral institutions to address the chronic surplus capacity, relying on market mechanisms to address surplus overcapacity in the face of policy distortions introduced by foreign trade partners will mean for certain the continuing erosion of U.S. steel production, and risks the industry's survival at a scale necessary to meet national security and critical infrastructure demands.

7. Section 232 measures worked to improve industry conditions, spur investments and jobs; removing them would jeopardize these investments

Assessment of available data demonstrates that the Sec. 232 steel measures coincided with improving conditions for U.S. producers—prior to the pandemic-related global recession beginning in 2020. Relief from the pressure of anti-competitive steel imports facilitated recovery of industrywide sales margins (a measure of profitability), production and capacity utilization rates, and a resurgence of new investment in steel industry fixed assets. A survey of publicly available sources reveals that following implementation of Sec. 232 measures, U.S. steel producers announced new investments, upgrades, plant expansions, and re-openings of idled facilities in at least 15 states, including plans to invest more than $15.7 billion in new or upgraded steel facilities, creating at least 3,200 direct new jobs.[xii] Just in the last year, U.S. producers report new investments of $6.2 billion adding 6 MMT capacity.[xiii] Importantly, as discussed further in following sections, Sec. 232 tariffs achieved improvements for U.S. steel producers without causing harm to downstream consumers of steel products in the United States.

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From the trough of the Great Recession in 2009, U.S. steel imports rose sharply from 14.7 MMT to 40.2 MMT by 2014, as seen in Figure C. A series of nearly 69 new anti-dumping and countervailing duty determinations between 2014 and 2016 curbed the inflow of steel imports to 30 MMT in 2016.[xiv] However, many foreign producers tried to evade these import measures by relocating steel production and processing to third countries, and imports climbed once again, reaching 34.5 MMT in 2017. But the Sec. 232 measures successfully slowed the pace of imports in 2018 and 2019, when imports fell to just 25.3 MMT. Overall, the volume of steel imports fell 27% between 2017 and 2019—before the pandemic's "Great Lockdown" slowed U.S. and global economic activity, and along with it steel imports fell to just 20 MMT. But in the goods-driven recovery that ensued in the U.S. economy, steel imports are once again surging to a projected 38 MMT in 2022.

As a result, capacity utilization for U.S. steel producers rose noticeably, but still fell far short of the 80% benchmark threshold assessed by Commerce to be necessary to sustain over the business cycle to sustain financial viability.[xv] In the business cycle prior to the 232 tariffs, U.S. steelmakers reached this level of activity less than 5% of the time; from implementation of Sec. 232 measures to the start of the pandemic U.S. steelmakers reached that operating threshold 79% of the time.

As it were, the margins afforded by Sec. 232 measures have afforded the U.S. steel industry an opportunity to recover to a level of financial performance not experienced since before the Great Recession, although this recovery has been undermined as exemptions from Sec. 232 measures allowed "leakage" of uncovered imports, and as recession from the pandemic's 2020 Great Lockdown set in. **Figure D** shows that following the Great Recession of 2007–2009, U.S. steel producers strained to achieve profitability. From the third quarter of 2009 through 2016, net income for the U.S. steel industry averaged just $73 million. Over the same period, net income as a share of sales—a measure of profitability—averaged 0%. In 2018, the year Sec. 232 measures were first imposed, net income in the steel industry reached $7.9 billion, or 6.4% of sales—its highest level since the real estate construction boom that preceded the Great Recession. U.S. steel producers recovered with the Sec. 232 measures, bringing idled capacity back online with expectations for improving market conditions. Expectations of relief from conditions of chronic global excess capacity helped draw new investments into U.S. steel production. New investment, adjusted for inflation, surpassed $5 billion in 2018 and reached nearly $5.9 billion in 2019—based on the most recent Census data.[xvi]

Since 2018, however, the U.S. steel industry has faced serious challenges. In 2019, the industry's net income receded to $2.9 billion, and in 2020 it sunk back into negative territory, posting losses with the pandemic-induced global recession. The erosion of import coverage under Sec. 232 measures coinciding with Commerce granting nearly 224,000 product exclusion requests from Sec. 232 steel measures, amounting to 88 MMT of goods.[xvii] Since the United States only imported about 34 MMT in 2017, exclusions amounting to nearly triple the import demand seem excessive.[xviii] A number of significant steel-producing countries, including Argentina, Brazil, Canada, Mexico, and South Korea, also obtained outright exemptions from Sec. 232 measures or quantitative quotas to replace import tariffs. These exclusions and exemptions significantly curtailed the coverage of Section 232 measures, although the measures remain significant in

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reversing the trend of declining viability of the U.S. steel industry. Today, most steel products are imported to the United States on a duty-free basis.

Although the industry-level measure of profitability shown in Figure D has recovered in the first quarter of 2022, it belies the rapid slowing of net income growth as producers face increasingly uncertain and volatile demand conditions. Under such market conditions, the well-documented "bullwhip effect" market price signals send distorted information that prompts businesses to change their strategic choices about when and how much to inventory supplies.[xix] These choices can appear to producers selling in the market as "irrational," inconsistent with standard assumptions of economic behavior. The confusion creates uncertainty risks that add cost and complexity to suppliers planning production and can result in market price mechanisms resulting in *disintermediation*. These disruptions to normal market behaviors reverberate back and forth through supply-chains from primary commodities to finished goods and services; the more linkages across which a global production chain is stretched, the more that each node can amplify the crack of the whip.

Removing Sec. 232 tariffs now would send another shockwave through these already destabilized supply chains, adding uncertainty about whether U.S. producers can maintain capacity utilization and financial margins for long-term sustainability. This raises questions for steel consumers and for policymakers considering national security needs whether future demand can be met by U.S. production?

8. Section 232 remedies have had negligible effects on the real price of steel imports and on steel-using industries Despite a 25% tariff, the Sec. 232 measures had a limited effect on U.S. import prices of steel products, as seen in **Figure E**. The product categories in Figure E represent roughly three-fourths of total U.S. steel imports and capture the effects of Sec. 232 measures on steel prices before the Great Lockdown disrupted global markets. Unit prices for imports of most steel products increased from 2017 to 2018—the year Sec. 232 import measures began. But then, import prices fell in 2019 and again in 2020, such that overall, averaged across all products, the import price of steel fell to $833 per metric ton in 2020 from $845 per metric ton in 2017. Thus, following the Sec. 232 measures, but before the pandemic upended the global economy in 2020, steel prices moderated.

Sec. 232 import measures coincided with and contributed to stabilizing prices for steel products in the U.S. market, as can be seen in **Figure F**, comparing prices paid to domestic steel producers relative to those paid by U.S. steel consumers purchasing comparable products on international markets for import. Unsurprisingly, both U.S. producer and import prices follow a common trend, although imports generally are lower priced than U.S.-made steel, as excess capacity and trade-distorting foreign government policies depress global prices. As the world emerged from the Great Recession in July 2009, particularly with China's outsized stimulus investments in infrastructure and real estate construction, steel prices around the world began rising sharply.[xx] Steel demand was so strong that it pushed up prices for key steel inputs globally, including iron ore and coal.[xxi] Then, as discussed above, expanded world steel production and surplus capacity through the middle of the 2010s began driving prices down.

Following implementation of Sec. 232 measures, Figure F shows domestic steel prices rose faster than U.S. import prices as the policy tackled non-commercial pricing of imported steel products. This is due to a combination of the Sec. 232 measures, other trade remedies—including anti-dumping and countervailing duty orders, which certainly had a favorable effect on pricing for the U.S. steel industry—and the appreciation in value of the U.S. dollar relative to foreign currencies, making foreign products comparatively less expensive in dollar terms. These factors drove a wedge between domestic and foreign prices, which enabled U.S. steelmakers to achieve more sustainable, market-based margins, even as steel prices fell in the U.S. and globally from late 2018 through to the trough of the pandemic recession in the summer of 2020.

Steel prices peaked in September of 2021 and declined through February of 2022. Following the Russian invasion of Ukraine, prices initially increased some, but have resumed their decline again, falling several hundred dollars per ton from the end of April. Steel prices will remain volatile with public health-related and Ukraine invasion-related supply-chain disruptions. The volatility of demand and bullwhip effect described above, and the softening macroeconomic outlook make it difficult for producers to plan production in the short term and investment for future capacity. Re-employing idled steelmaking capacity requires significant lead time and fixed investments. Under such uncertainty, managers face difficult output and investment decisions, meaning that supply responds slowly to unexpected changes in demand. Only after market conditions create confidence that a facility can operate at a high level of capacity for a sustained period is there clarity for managerial decision making. In this environment, maintenance of Sec. 232 import measures will remain critical to ensuring the economic stability and financial viability of the U.S. industry. Country- and product-specific trade remedies, though critical, are targeted rather than comprehensive, and their implementation necessarily lags the injurious effects of chronic excess capacity and development policy interventions.

An important concern in assessing the impacts of Sec. 232 measures on imported steel products is how these measures affect downstream industries and consumers of products that use steel inputs. Harm to downstream industries would occur if Sec. 232 measures significantly increased steel prices, causing increased costs for producers or consumers of primary steel-containing goods, and then those costs squeezed profit margins or consumer welfare—by forcing consumers to either pay more for or consume less of a given product.

To assess this linkage between steel input prices and end-user prices, we employ standard, related, and time-tested econometric techniques known as Granger causality analysis, a method developed by Nobel Prize-winning economists Robert Engle and Clive Granger.[xxii] Granger causality analysis tests for evidence of a statistically causal relationship between the variables in the model. If past values of variable 1 are shown to (statistically) significantly predict current values of variable 2, then it can be concluded that variable 1 "Granger-causes" variable 2.

While the price variable used in this modeling includes the effects of Sec. 232 tariffs and quotas, the results of the statistical test are not limited to the effects of Sec. 232 measures, but rather evaluate whether a change in prices resulting from any factor causes a change in the price of the steel-using good. In effect, they are a measure of how strongly one input price influences the prices of other intermediate and final goods, and if it even does in a statistically meaningful way. I summarize the results of this analysis in **Table 1**.[xxiii] Each row of the table represents results of a

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separate model relating the price of a steel-containing product with the price of its most relevant primary steel input(s) and reports the causal effect found on end-use product prices. The end-use products investigated represent the U.S. industries consuming the largest volume of steel products: nonresidential construction, motor vehicles, motor vehicle parts, construction machinery, electrical equipment and household appliances, and food processing (food consumed at home). I also evaluate the possible impacts of Sec. 232 steel measures at a broader level by modeling the effects of steel product prices on aggregated prices for durable goods.

The analysis in Table 1 shows no discernible effect of steel prices causing price changes in new motor vehicles, motor vehicle parts, construction machinery, or nonresidential construction goods. These results, therefore, suggest that even if Sec. 232 measures caused an increase in the price of steel products, one would not expect it to result in a change of prices for these downstream goods. For prices of electrical equipment and appliances and food consumed at home, as well as for durable goods more generally, the price of relevant steel inputs is found to be causal of changes in the prices of steel-using products. This identifies existence of a statistically observable relationship between steel input prices and final goods prices. But the same analysis shows that the economic significance of the impact is negligible: a 1% increase in steel input prices causes a one-time 0.06% change in the price of electrical equipment and household appliances, a 0.05% one-time increase in the price of food at home, and a 0.06% one-time change in durable goods prices.

To recap, while conceptually a relationship exists between input prices and final goods prices, econometric analysis of the causal relationship between prices finds effects ranging from statistically zero to essentially nothing. Sec. 232 measures simply did not have a meaningful, real-world impact on prices for steel-consuming products. This fact should not be surprising. Even in the industries that consume the largest volumes of steel products, steel is just one cost in a long list of inputs to production. Depending on a firm's market power, input price increases may be absorbed in production and never reflect in final prices. Despite these industries accounting for the lion's share of steel consumption in the U.S. economy, the cost of their steel inputs is minor relative to their gross production. As shown in Table 1, the steel content as a share of total production ranges from 1% in food consumed at home to 9.8% in the motor vehicle parts industries. Illustrating the point in dollar terms, although the average passenger car may contain roughly 900 kg of steel, the steel inputs amount to just 2% of the sales price for the average new U.S. car. In contrast, electronic components, including semiconductor chips, make up roughly 40% of a new car's price.[xxiv]

9. Sec. 232 tariffs had no effect on current inflation and removing them will put supply chain resilience farther out of reach. One can debate what alternatives to the Sec. 232 tariffs were possible or preferable, but it is clear tariffs didn't make the sky fall after 2018, as a number of special interest groups had predicted. The unspectacular effects of these tariffs on prices are plain to see by breaking up the recent experience into three periods. **Figure G** compares the average inflation rate performance across consumer price and various key industrial goods price measures in the period preceding these tariffs, the nearly two-year period with tariffs in effect prior to the pandemic, and from the pre-pandemic business cycle peak through the latest May 2022 data. Inflation, broadly, decelerated substantially after implementation of the tariffs in the pre-pandemic period. This is true for manufactured goods writ large, as well as for consumer prices overall, measured in the Consumer Price Index (CPI). Tellingly, price increases for steel and aluminum slowed sharply to 0.7-0.8% annually from roughly 10% and 4% annually, respectively—largely

attributable to U.S. producers redeploying and reinvesting in domestic production capacity amid improved financial conditions resulting from the tariffs.

Price increases for transportation equipment—the biggest metals-consuming industry, including for cars and trucks and their parts—slowed by more than one-third. In some other leading metal-using industries, prices accelerated modestly, but nothing to affect the overall downward trend in prices, and nothing on the order of doomsday predictions prophesied by tariff opponents. In other words, for two years markets and policymakers adjusted to these measures before the pandemic without a hiccup. Inflation, broadly, only spiked after February 2020; it is simply not plausible to infer that these tariffs had a causal role in pandemic-era inflation.

Removing the tariffs now—even ignoring impacts on already strained supply chains—would have a similarly negligible impact on the surging inflation we are now experiencing. **Figure H** illustrates why: overall tariff and customs duties paid on U.S. imports amount to a trivial share of overall personal consumption expenditures. In the nearly two years following the Sec. 232 and Sec. 301 tariffs, customs duties as a share of consumer expenditures increased from 0.3% to 0.4%, on average, relative to the period preceding tariffs. Even if one were to assume (implausibly) this was due to Sec. 301 and 232 tariffs and no other factors, they amounted to at most a 0.1% increase in prices.

But, of course, there were other economic factors at work and the increased tariff collection did not translate into higher inflation. In fact, Figure B shows that consumer prices decelerated from 2.0% to 1.8%, on average, annualized, after implementation of the tariffs and through the business cycle peak in the first quarter of 2020. Customs duties continued to ratchet up during the pandemic, minimally and mechanically, as people shifted from consuming services—less available in the pandemic—to goods, and imports surged with a stronger U.S. dollar, adding another 0.1% as a share of consumer spending. At best, removing these tariffs would result in a one-time price decrease of 0.2%—a drop in the bucket when you consider consumer prices have risen by more than three times as much, on average, every month since January 2021.

Although the price effect of removing Sec. 232 tariffs would be unnoticeable, such a change would likely have notable effects on output, demand, employment, and investment decisions up and down the supply chain. Above we discussed the "bullwhip effect" resulting in a failure of the market's price signaling mechanism, though there are many reasons to believe that global markets would not adjust frictionlessly to tariff policy changes, as proponents of eliminating tariffs assume in their economic modeling. In the real-world economy, such an action will predictably result in increased production and transportation disruptions, add uncertainty costs for producers and consumers, increase the financial stress on steel industry firms, and put jobs at risk.

Conclusion

The steel Section 232 trade restraints imposed in 2018, including both tariffs and quotas on imports from selected countries, helped slow the flood of steel imports. Following imposition of these measures, U.S. steel output, employment, capital investment, and financial investment all improved. The policy achieved these outcomes with no economically significant impacts on the prices of downstream products, as shown by statistical analysis presented in this submission.

The tariffs—implemented in 2018—had little effect on U.S. prices, and inflation only spiked after the pandemic recession began in February 2020. At best, removing these tariffs would result in a one-time price decrease of 0.2%—a drop in the bucket when consumer prices have risen by more than three times as much, on average, every month since January 2021, driven largely by pandemic-related global supply chain disruptions and the war in Ukraine.

The U.S. steel industry is still emerging from the depths of the COVID-19 recession and faces a steep hill to climb. Removing these tariffs would undermine the U.S. steel industry and the millions of jobs it directly and indirectly supports, and increase domestic dependence on unstable supply chains, resulting in job losses, plant closures, cancellations of planned investments, and further destabilization of the U.S. manufacturing base at a time of intensifying strategic importance for good jobs, national security, and the race to green industry.

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Figures and Tables

TABLE 1

Effects of Section 232 steel measures on end-use products

End-use product	Primary steel inputs	Total steel inputs as share of gross production costs	Causal effect on end-use goods prices
Durable goods (personal consumption expenditures)	Cold-rolled steel sheet and strip; hot-rolled steel sheet and strip, including tin mill products; hot-rolled steel bars, plates, and structural shapes, carbon	—	0.06%
New motor vehicles (consumer)	Cold-rolled steel sheet and strip	4.30%	No statistical causal relationship
Motor vehicle parts (producer)	Hot-rolled steel sheet and strip, including tin mill products; Hot-rolled steel bars, plates, and structural shapes, carbon	9.80%	No statistical causal relationship
Nonresidential construction goods	Hot-rolled steel bars, plates, and structural shapes, carbon	1.90%	No statistical causal relationship
Construction machinery	Hot-rolled steel bars, plates, and structural shapes, carbon	8.20%	No statistical causal relationship
Electrical equipment and household appliances	Cold-rolled steel sheet and strip; Steel wire, carbon	4.70%	0.06%
Food at home	Hot-rolled steel sheet and strip, including tin mill products	1.00%	0.05%

Source: Authors' analysis of BLS (2020, 2022) and FRED (2022) data.

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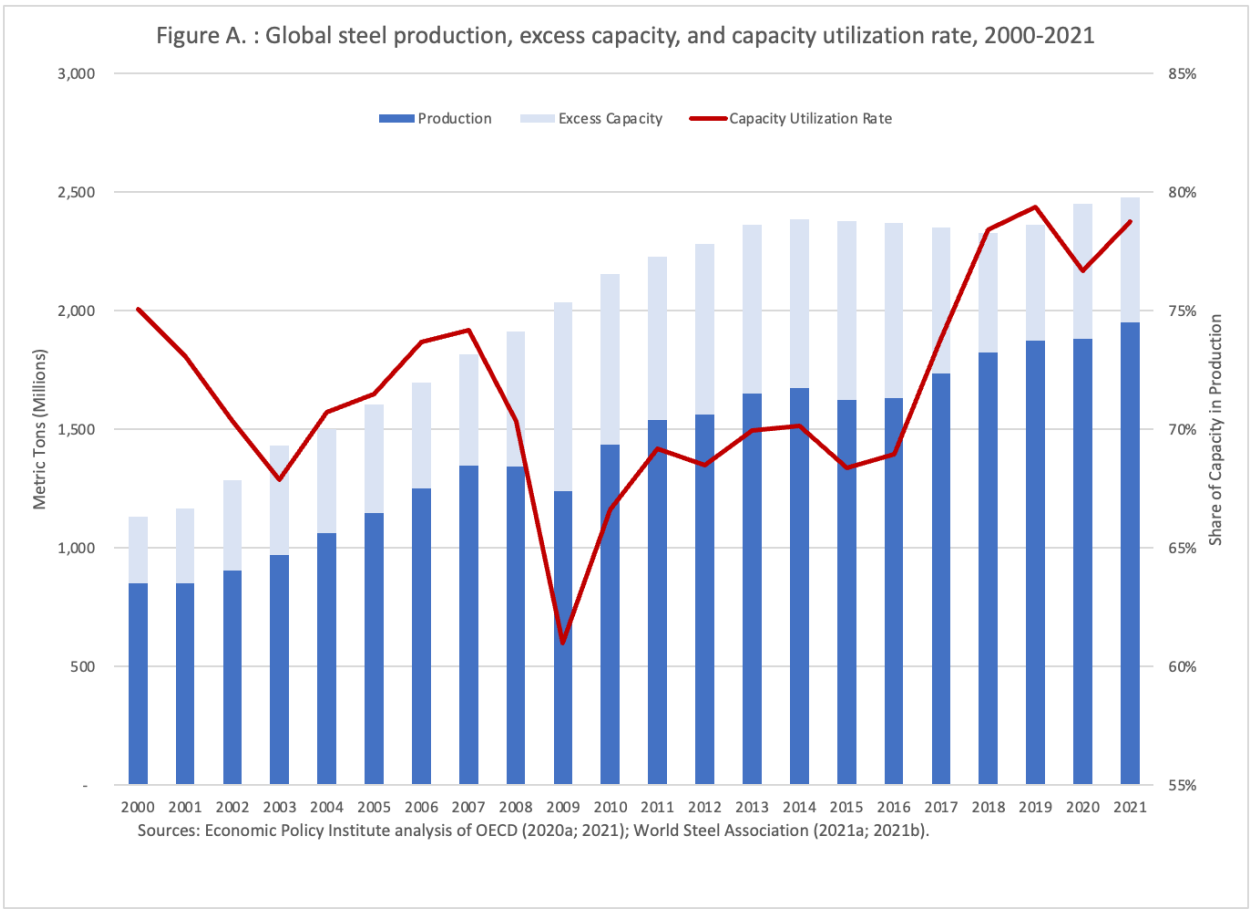
Figure A. : Global steel production, excess capacity, and capacity utilization rate, 2000-2021
3,000
2,500
2,000
1,500
1,000
500
-
85%
80%
75%
70%
65%
60%
55%
Production
Excess Capacity
Capacity Utilization Rate
Metric Tons (Millions)
Share of Capacity in Production
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021
Sources: Economic Policy Institute analysis of OECD (2020a; 2021); World Steel Association (2021a; 2021b).

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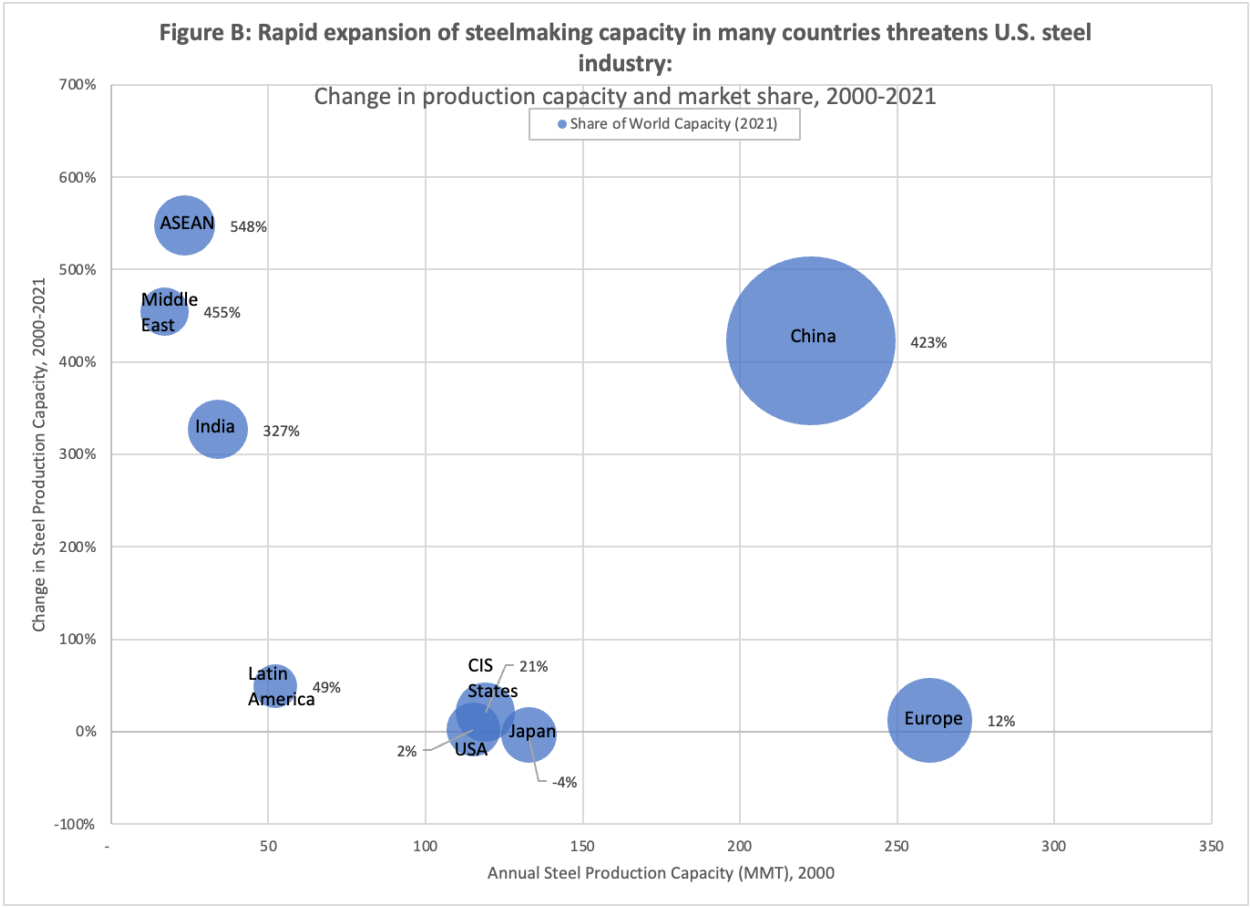
Figure B: Rapid expansion of steelmaking capacity in many countries threatens U.S. steel industry:



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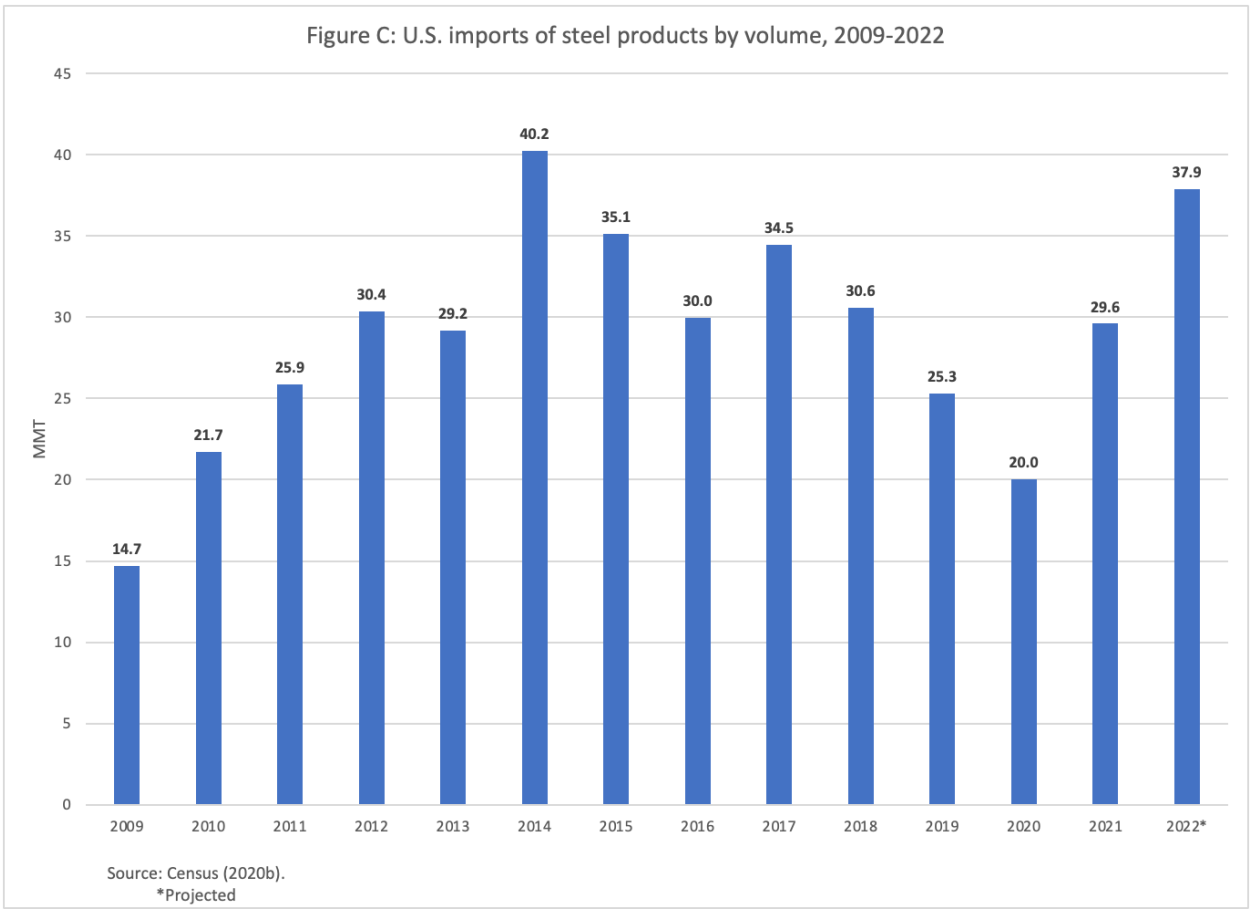
Figure C: U.S. imports of steel products by volume, 2009-2022
MMT
45
40
35
30
25
20
15
10
5
0
14.7
21.7
25.9
30.4
29.2
40.2
35.1
30.0
34.5
30.6
25.3
20.0
29.6
37.9
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022*
Source: Census (2020b).
*Projected

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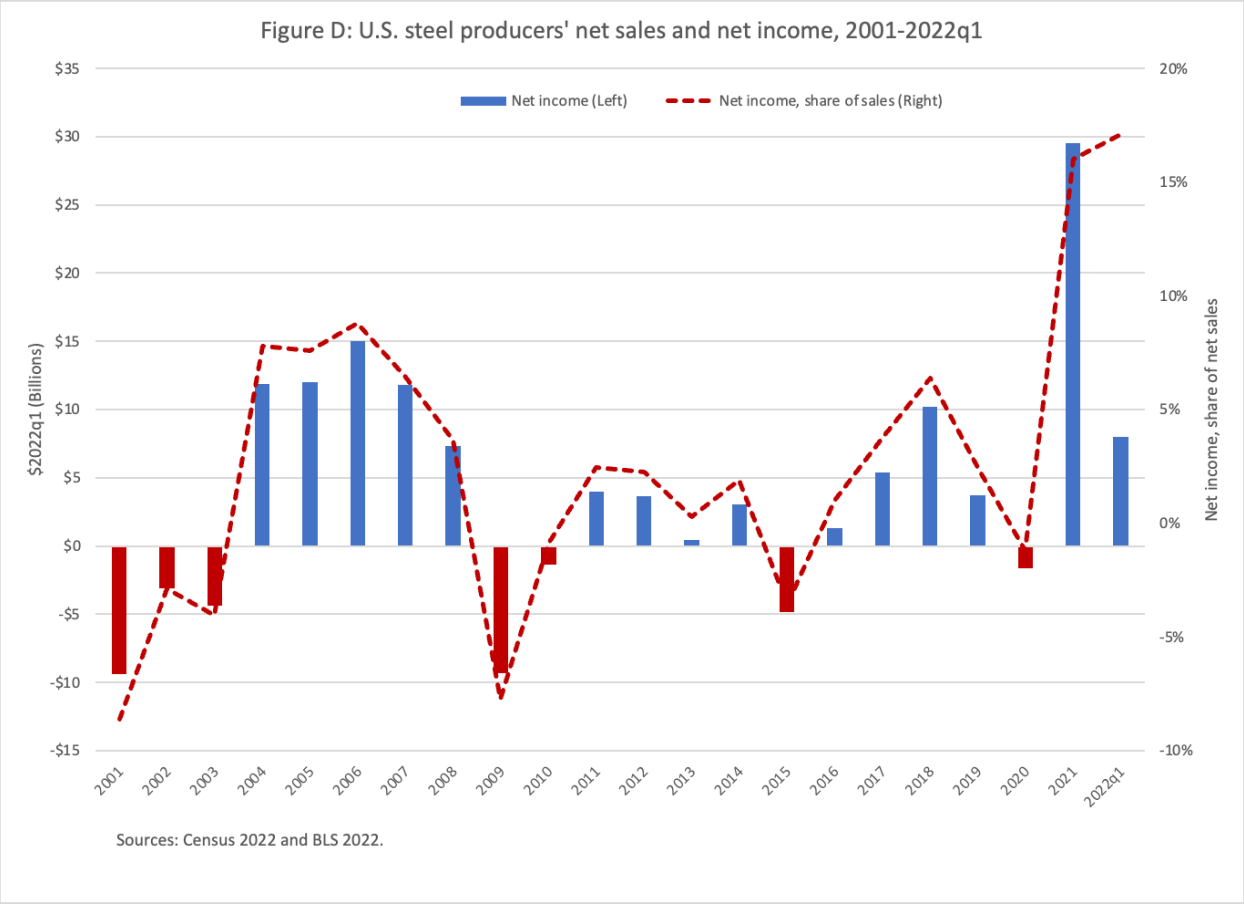
Figure D: U.S. steel producers' net sales and net income, 2001-2022q1
Net income (Left)
Net income, share of sales (Right)
$2022q1 (Billions)
Net income, share of net sales
$35
$30
$25
$20
$15
$10
$5
$0
-$5
-$10
-$15
20%
15%
10%
5%
0%
-5%
-10%
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022q1
Sources: Census 2022 and BLS 2022.

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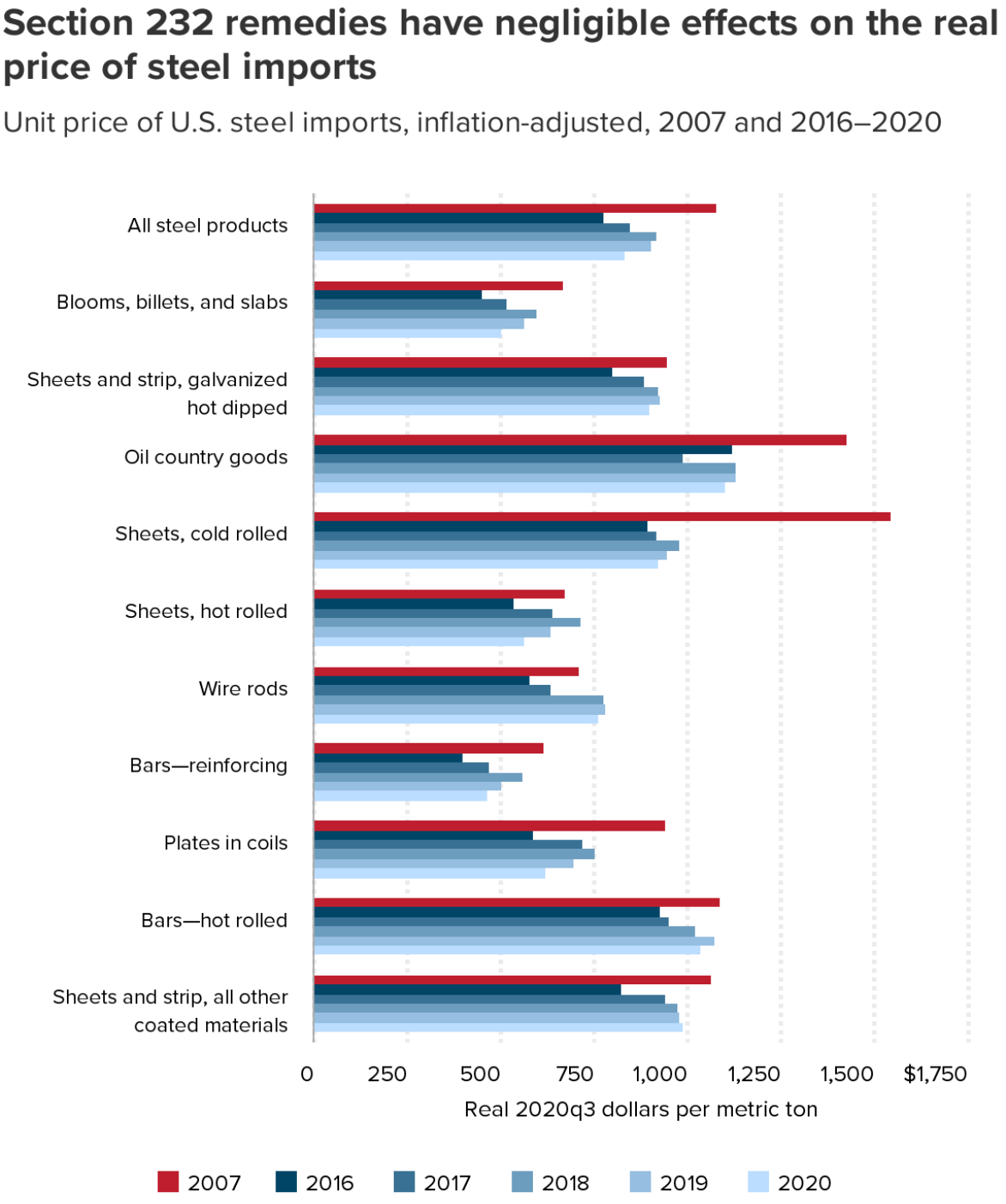
Figure E: Unit price of U.S. steel imports, inflation-adjusted, 2007 and 2016–2020



Sources: U.S. Census Bureau 2020b; Bureau of Labor Statistics 2021b.

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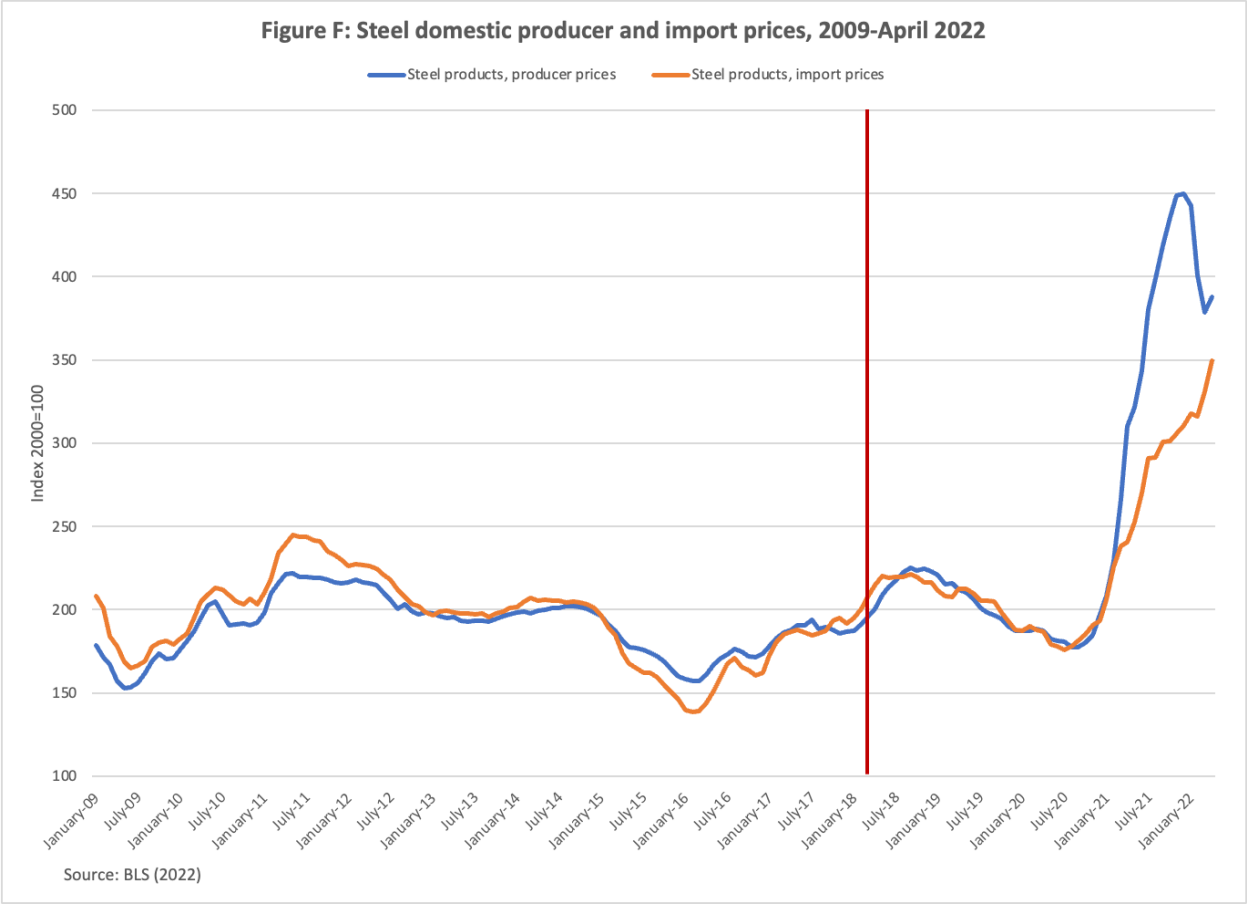
Figure F: Steel domestic producer and import prices, 2009-April 2022
Steel products, producer prices
Steel products, import prices
Index 2000=100
500
450
400
350
300
250
200
150
100
January-09
July-09
January-10
July-10
January-11
July-11
January-12
July-12
January-13
July-13
January-14
July-14
January-15
July-15
January-16
July-16
January-17
July-17
January-18
July-18
January-19
July-19
January-20
July-20
January-21
July-21
January-22
Source: BLS (2022)

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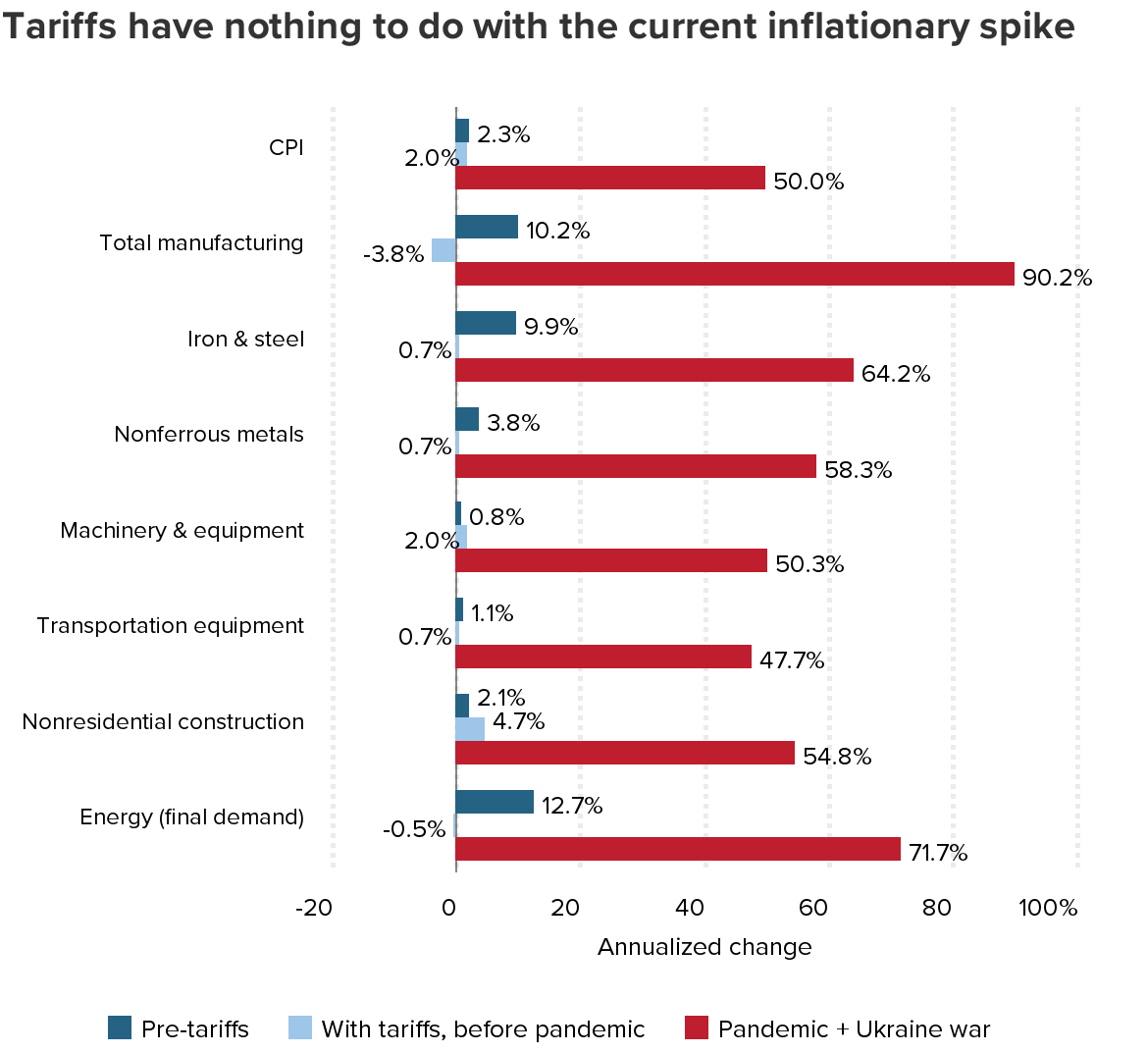
Figure G: Pre-tariff, tariff, and pandemic-era inflation



Note: Pre-tariffs = April 2016–February 2018; With tariffs, before pandemic = March 2018–January 2020; Pandemic = February 2020–May 2022.

Source: EPI analysis of BLS 2022 data.

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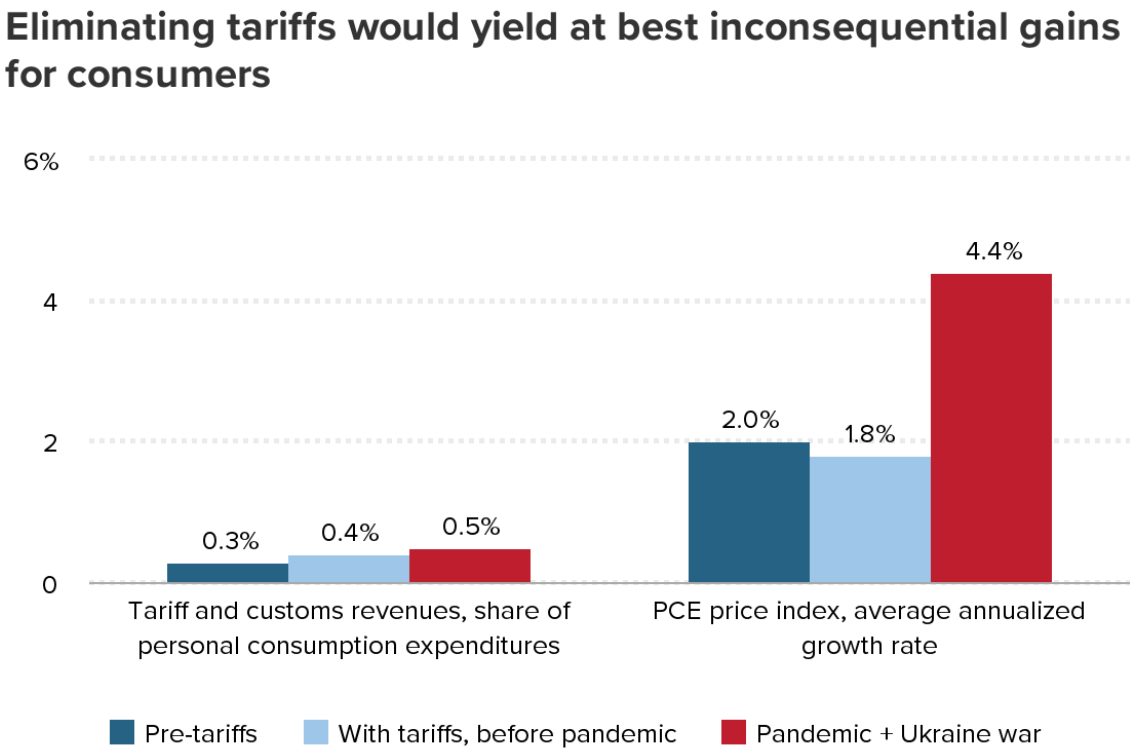
Figure H: Inflation before and after tariffs, and since the pandemic



Note: Pre-Trump tariffs = 2016, third quarter–2018, first quarter; With tariffs, before pandemic = 2018, second quarter–2019, fourth quarter; Pandemic = 2020, first quarter–present.

Source: EPI analysis of BEA 2022 data.

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[i] This analysis, throughout, updates to the most recently available data and refers to analysis presented in the report by Adam S. Hersh and Robert E. Scott, "Why Global Steel Surpluses Warrant U.S. Section 232 Import Measures," *Economic Policy Institute*. March 24, 2021.

[ii] Bureau of Industry and Security (BIS). 2018. 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. January 2018.

[iii] Board of Governors of the Federal Reserve System (US), Capacity Utilization: Manufacturing: Durable Goods: Iron and Steel Products (NAICS = 3311,2) [CAPUTLG3311A2S], retrieved , June 29, 2022.

[iv] Henze, Veronika. "Steel Industry Set to Pivot to Hydrogen in $278 Billion Green Push." BloombergNEF, December 1, 2021; Kinch, Diana. "Global Aluminum Needs up to $1.5 Trillion Investment to Decarbonize Energy Supplies: IAI." S&P Global Commodity Insights, March 16, 2021.

[v] Cameron, Ian. 2022. *Greenhouse Gas Reduction Challenges for American Flat Steel Producers*. Hatch. May 12, 2022.

[vi] The capital-to-labor ratio for primary metals producers is 76% higher than for durable goods manufacturing industries overall. See BLS (2020).

[vii] Crotty, James. 2002. "Why There Is Chronic Excess Capacity." *Challenge* 45, no. 6: 21–44.

[viii] Rimini, Michele, Anthony de Carvalho, Fabien Mercier, Valentina Burrai, Benjamin Liebman, and Timothy de Stefano. 2020. "Barriers to Exit in the Steel Sector." *OECD Science, Technology and Industry Policy Papers, no. 93*: 1–62. October 2020.

[ix] See Adam Hersh and Rob Scott, "" (2021), and American Iron and Steel Institute (AISI). 2020. Comments Regarding Foreign Trade Barriers to U.S. Exports for 2021 Reporting [Docket Number USTR–2020–0034]. October 2020.

[x] Bureau of Industry and Security (BIS). 2018. 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. January 2018.

[xi] See for example: "China Invests US$2.54 Billion in Steel Plant in Central Java." 2018. *Antara News*. July 28; *Reuters*. 2021. "China's XCMG Says Agreed with Tsingshan Group to Invest in $843 Million New Energy Project." *Reuters*. January 4; Rahaman, Mir Mostafizur. 2018. "Chinese Company to Invest $2.3B in Steel Plant." *The Financial Express*. July 15; Mercurio, Richmond. 2018. "China Steel Firm Investing $3 Billion in Philippines." *Philstar.com*. June 23.

[xii] See Appendix Table 1A, Adam Hersh and Rob Scott, "" (2021).

[xiii] See Nucor statements September 20, 2021, September 21, 2021, April 7, 2022; U.S. Steel statement January 11, 2022.

[xiv] (USITC 2021). The USITC (2021) lists 276 anti-dumping and countervailing duties in effect on steel products (categories ISM, ISO, and ISP) as of December 28, 2020, and of those, 69 orders went into effect between 2014 and 2016.

[xv] Bureau of Industry and Security (BIS). 2018. 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. January 2018.

[xvi] See Figure E: Adam Hersh and Rob Scott, "" (2021).

[xvii] See BIS Section 232 Portal, available at https://232app.azurewebsites.net/steelalum; regulations.gov (steel and aluminum dockets), available at https://www.regulations.gov/docket/BIS-2018-0006 and https://www.regulations.gov/docket/BIS-2018-0002; https://www.mercatus.org/bridge/commentary/section-301-tariff-exclusions-and-extensions-continued

[xviii] See U.S. Census. 2018. *Imports of Steel Products*. [PDF] December 2017.

[xix] Hau L. Lee, V. Padmanabhan and Seungjin Whang. 1997. "The Bullwhip Effect in Supply Chains." *MIT Sloan Review*. April 15, 1997; https://www.jstor.org/stable/2634565

[xx] Hersh, Adam. 2014. *Assessing China's Economic Reform Agenda*. Center for American Progress, May 2014.

[xxi] World Bank. 2020. "'Pink Sheet' Monthly Prices: December 2020" [Excel file]. Accessed December 28, 2020.

[xxii] This method estimates a "vector autoregression" (VAR), a statistical method for modeling a system of variables and their interrelationship and co-evolution over time. In this case, I model (1) the price of primary steel inputs, (2) the price of steel-consuming products, and (3) the effective federal funds rate.

[xxiii] Data, code, and full results are available at the request of the Commission.

[xxiv] Steel Benchmarker. 2020. "Price History: Tables and Charts" [PDF]. Accessed December 28, 2020; Deloitte. 2019. *Semiconductors—The Next Wave*. April 2019.

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