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POLICY BRIEF

Competition in International Shipping: What the Administration Misunderstands about the Current Crisis, and How the Jones Act Makes Everyone Worse Off

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This brief's title, especially the latter part, may seem puzzling at first: How can a policy that makes everyone worse off have stayed around for 100 years basically unaltered? The title portrays a bigger picture, though: American shipbuilders, mariners, and shipping company owners are better off because of the law, but the rest of the population—those not employed in the building or sailing of US-built, -owned, -flagged, and -crewed ships that carry domestic goods by water—is worse off. Without the law, shipping would be less expensive; gas prices and highway congestion might be less too. Despite these facts, and despite multiple recessions, wars, and even a life-altering pandemic over the past 100 years, the Jones Act has enjoyed steadfast bipartisan support.

Although 2022's monumental supply chain disruptions are not entirely the fault of the Jones Act, it is not a stretch to say the act has played a pivotal role in exacerbating the crisis. In the wake of a pandemic that, as of this brief's publication, has not yet fully ended, shipping costs have skyrocketed. Wait times for basic goods have increased too, with staple home appliances such as dishwashers and refrigerators taking months to arrive in stores.

The Biden administration has blamed increasing prices on the concentration in ocean-based shipping markets, alleging that "global alliances" among the largest shipping firms are harming American consumers while the international shipping companies rake in record profits.[1] The administration has pointed to concentration in shipping markets as the key driver of both shipping delays and inflated shipping prices. Included in the administration's "whole of government"[2] approach is the idea that all transportation sectors are concentrated to an anticompetitive extent, and large,

multinational shipping companies have been colluding for decades to raise prices, reduce output, and reap enormous profits.[3]

Holding aside for the moment the assertion that concentration alone is a main factor leading to supply chain disruptions, the federal government has in place a significant barrier to entry in shipping markets that has disrupted water-based transportation for the past century. In a recent policy brief for the Mercatus Center, we discuss market-distorting federal regulations, and prominently featured on our list is the Jones Act.[4]

In this policy brief, we will first dispense with the idea that the higher prices and increased profits seen now in the shipping industry are due to corporate greed and propose instead an explanation based on quasi-rent extraction and demand-based pricing for shipping companies. Second, we will discuss the market structure of the ocean-based shipping industry and dispel the myth that concentration is a primary, or even relevant, force driving higher prices. Next, we will turn to the ways that the Jones Act distorts shipping markets and decreases competition and consumer welfare. Finally, we will analyze the shipping landscape in a post–Jones Act world and show how the federal government, through deregulation, has ample tools to unleash competitive pressures on the American economy, dramatically lowering prices and increasing the supply of shipping services.

HIGHER PRICES

The higher prices in the market today are not a function of industry concentration. They are also not a function of newfound corporate greed. The 100 percent increase in shipping prices between Asia and the United States and 1,000 percent increase between the United States and Asia are a function of unprecedented demand.[5] Similar trends were seen after the Global Financial Crisis, when shipping demand resumed after a prolonged decline. In the years following the Global Financial Crisis there was an uptick in shipping company margins.[6]

At its postcrisis peak in Q3 2010, the average operating margin for ocean shipping companies reached 16 percent, up from an operating *loss* of nearly 20 percent in Q1 2009. This margin quickly dipped again, reaching as low as −12.1 percent in Q1 2012, before hovering just above break-even from 2013 to 2020.[7] Smaller events seen following the Global Financial Crisis are the minor economic slowdown in 2016 (when margins reached −9.7 percent before rebounding to 5.3 percent), and the fallout from tariffs levied during the Trump administration,[8] leading to losses of 3.8 percent in 2018 followed by profits of 3.7 percent in 2019.

This fluctuation between profit and loss in the shipping industry is normal and well understood.[9] When consumers around the globe demand fewer goods because of, for example, tariffs or a widespread recession, demand for shipping services decreases in tandem. To maintain normal operations, shipping companies decrease rates, leading to lower profits and sometimes even losses.

When demand for products suddenly increases, as during an economic boom, demand for shipping services also increases. In the short term, shipping companies are unable to meet all the demand, which can happen because of ship or labor shortages, estimation errors, or simply because shipping companies are unable to predict when consumer demand will improve. Given such a surprise increase in demand, and given that capacity is limited primarily by how quickly a company can complete international shipping voyages, short-term increases in demand overwhelm the available supply. To slow this demand and service as many shipping requests as possible, shipping prices increase so that the most immediate shipping needs are met first, albeit at a higher price.

Quasi-Rents

Though this fluctuation does lead to profits in the short term, these are not due to market concentration or market power. Rather, these profits are "quasi-rents,"[10] which are the excess prices paid to suppliers—in this case, shipping companies—in times when supply is limited and demand increases.[11] Quasi-rents are short-lived, reflecting outside economic influences and not an overarching ability for suppliers to anticompetitively raise prices. Moreover, quasi-rents are only able to be extracted from the market because demand shocks are so unpredictable. If, for example, shippers and those companies that demand shipping services had been able to predict the unprecedented circumstances of the pandemic, likely no rents would have been available. Companies demanding shipping services would have foreseen the increase in demand for their products and added supply before prices rose, and shippers would have purchased new ships years ago and brought the additional capacity into their fleet just as demand for their services increased. Unfortunately, the benefit of a crystal ball was not available to either side of the market, and prices rose.

However, the rise in prices that has been seen during the most recent wave of "elevated profits and soaring profit margins" is unlike the rise seen during the Global Financial Crisis.[12] In general, the level of unemployment seen during the COVID-19 pandemic was lower than during the Global Financial Crisis, leading to a stable demand for nonstaple goods but a decreased demand for services owing to lockdowns. This spending, typically associated with services, such as travel and experiences, was shifted to goods, further increasing demand. With stores shut down to in-person traffic, home delivery of products made online shopping a mainstay in many households, which led to a dramatic increase in demand for shipping services. All told, given the characteristics of the economic environment during the pandemic, the level of profit seen in the shipping industry is largely in line with expectations.

Increased Demand for Goods and Shipping

Although unemployment increased during the pandemic, this effect was nowhere near as long-lasting as during the financial crisis.[13] As a group, white-collar, high-income workers maintained their jobs and shifted to working from home.[14] Although not all consumers are the same, some

general spending trends were prevalent during the pandemic that were centered on goods, specifically those that were shipped to consumers' homes.[15] Shifting wardrobes from primarily in-office to work-from-home styles was a large source of spending, as was home improvement and procuring items for a home office.[16]

Additionally, with the rapid spread of COVID-19 came a dramatic increase in demand for personal protective equipment (PPE) and other specialized medical equipment. Demand for PPE exploded to an estimated 100 times prepandemic levels,[17] and before 2020, 90 percent of N95 masks used in the United States were imported.[18]

Constraints

With increased spending on goods comes stressed supply chains. Although shipping initially dipped owing to demand and labor shortfalls in mid-2020, by the end of 2020 ocean-based shipping was operating at full capacity.[19] Blank sailings, whereby a leg of a journey is skipped owing to too little demand at a port or to time constraints, dropped to 1 percent in October 2020.[20]

The main constraint faced by shipping companies at the end of 2020 was container availability, not labor availability.[21] Because of the lack of containers, goods were able to get to ports in high quantities, but getting those goods onto ships was a problem. Lengthy unloading and extraport shipping processes also led to slowdowns and higher costs for shipping companies, exacerbating the problem. Ports in California and Virginia saw record cargo volumes routed through their facilities, with volumes hitting all-time records in California.[22] Because these companies were unable to unload goods quickly enough in the face of record demand, ships spent time idle around ports, increasing operating costs for shipping companies and reducing the number of containers a ship can carry in a given timeframe.

Another constraint on shipping companies' ability to service US ports quickly is the Jones Act. Because the vast majority of ocean-based shipping companies are not based in the United States and do not meet Jones Act requirements, they cannot pick up cargo in one US port and drop it off in another US port.[23] This generates a substantial inefficient underutilization of shipping capacity. Whether by additional ship, truck, or rail, these extra steps add cost, complexity, and time to the shipping process that would not be relevant if a single foreign ship could service more than one US port.

Concentration

The Biden administration claims that ocean-based shipping is concentrated to the point where shippers are able to collude with competitors, raise prices, and cause massive delays that harm the American economy. These so-called alliances allegedly control 80 percent of the global shipping

market and ship 95 percent of the cargo between Asia and the Americas.[23] The administration notes that the same group of shippers controlled only 30 percent of the market a decade ago.[24]

Although some metrics are not in dispute, such as the increase in the share of large shipping companies as a proportion of the entire industry, taking raw measures of concentration as given is highly misleading. Firm size and the number of firms in a market have more to do with barriers to entry and capital intensity than they do with collusive and anticompetitive activity. Later in this brief we will discuss the Jones Act, which is a substantial barrier to entry, but for the moment our focus is on the changing capital intensity of the ocean-based shipping market and the effect of this changing intensity on market structure.

The average ship size has substantially increased since 1970. In 1970, brand new container ships had a maximum capacity of around 1,500 twenty-foot equivalent units (TEUs), or the number of 20-foot containers that a ship is able to carry.[25] By 1980, 1,500 TEU ships were the norm, with new ships reaching over double that capacity.[26] By 2015, the largest ships had a capacity of over 15,000 TEUs, with the average ship in operation reaching nearly 5,000 TEUs.[27]

This more than tripling in capacity for the average ship over the course of 35 years has led to widespread economies of scale, but it also necessarily changed the business environment for shipping firms. With an increase in a ship capacity comes an increase in cost. In 2015, the cost of a 5,000 TEU ship was around $60 million,[28] with the largest 20,000 TEU ships topping out at $160 million.[29] Cooperation agreements, also known as alliances, and mergers are fundamental ways that shipping firms mitigate these costs.

By forming these alliances, shipping firms split the cost of these "mega ships" and share the capacity,[30] leading to significant savings. The operational marginal cost per TEU of a 5,000 TEU ship is over $600.[31] That drops to under $400 when increasing capacity to 15,000 TEUs.[32] Further savings are available with even larger ships.

One criticism that arises after decades of mega ship development and alliance formation is the inability to fill these large ships to their maximum capacity. Before the pandemic, shipping companies faced excess capacity as high as 48 percent on some less desirable routes, and this number dropped to 35 percent for other routes.[33] By pooling their resources, these alliances have built significant capacity and reduced costs to consumers. The average new ship as of 2018 had a maximum capacity of 17,000 TEUs and was purchased primarily by smaller shippers within an alliance.[34] In 2018, the Organisation for Economic Co-operation and Development (OECD) alleged that "overinvestment" in capacity had led to a rapid increase in capacity that was out of lockstep with demand.[35] This assertion, however, is the opposite of what has been alleged during the pandemic. The administration blames alliances for reducing capacity and driving up shipping costs, but without the emergence of alliances and this investment in capacity, the current shipping crisis would likely be worse.

A significant problem with current criticisms of lack of capacity is that commentators fundamentally misunderstand how to measure the incentives to further invest to expand capacity. Up until the point where a ship is full, the marginal cost, or the cost of adding an additional unit of cargo, is small compared with that of purchasing a new ship. An estimate of marginal cost (fabricated for this example) of $700 per cargo container represents less than 0.01 percent of the total cost of a $160 million 15,000 TEU ship. Because the cost of the ship and crew is already accounted for, adding an additional cargo container is virtually costless to the shipping company.

However, marginal cost skyrockets when adding a unit of cargo on an already-full ship. In this case, the marginal cost associated with that additional unit of cargo is equal to the price of an additional ship and the crew to operate that ship. At this point, the marginal cost goes from near zero to more than $160 million. This is why shipping prices have increased. To manage demand in the short term, it is not feasible to purchase a new ship. Therefore, prices rise to a level that is greater than marginal cost. This is not an example of price gouging; it is the economy working as it should.

Reports on concentration and oligopoly in shipping markets are inconclusive. A joint report by the International Transportation Forum and the OECD finds that Herfindahl-Hirschman Index (HHI) levels have risen between 1998 and 2018. In 1998, the HHI for the entire ocean-based shipping industry was 300.[36] As of 2018 that number was 1,400. Additionally, the four-firm concentration ratio rose from 20 percent in 1998 to slightly less than 60 percent in 2018.[37] These measures are consistent with the increase in investment and alliance participation over the same 20-year period. The report concludes that these values indicate the market for ocean-based shipping is highly concentrated, while noting that the concentration literature notes a four-firm concentration ratio of over 60 percent and an HHI index value greater than 1,800 are indicative of highly concentrated industries.[38] The report's conclusion that ocean shipping market concentration is high ignores the fact that neither of the literature-based thresholds for high concentration have been met.

Additionally, a recently released report by the Federal Maritime Commission (FMC) comes to a different conclusion. The FMC first notes that price increases and shipping delays in both the transatlantic and transpacific markets are a result of "overwhelming U.S. demand."[39] They go on to note that the transpacific market is not concentrated, and the transatlantic market is "barely concentrated."[40] Although the report does not include values for its HHI calculations, the FMC notes that the HHI for the transpacific market *decreased* throughout the pandemic from already nonconcentrated levels, indicating that more firms are entering the market in response to the increase in demand. The transatlantic market, the FMC reports, is only moderately concentrated, but is at the bottom end of the threshold. These findings are in line with those of the FMC's European counterparts, that no evidence suggests anticompetitive conduct had a role to play in raising shipping prices.[41] In a particularly direct conclusion, the FMC asserts, "we have, to date, observed no indication that the current prices for liner shipping are a result of collusive or illegal conduct on the part of the major ocean carriers in our markets."[42]

The bottom line is concentration is not the reason for higher prices. Changing business models and consolidation may play a part in the larger picture, but excess demand for goods and shipping services is the root cause of the "1000 percent" price increase found by the administration.

JONES ACT

As previewed in the introduction, the Jones Act requires that domestic maritime shipping be fulfilled by ships that are built, owned, and flagged in the United States.[44] Although it might seem surprising that a century-old regulation has any bearing on the supply chain disruptions following a pandemic in 2020, institutional analysis demonstrates that the Jones Act's impact has been direct and substantial. Because the shipping industry is increasingly globalized, the restriction of an entire market to domestic-only carriers leads to significant distortions. Ships operating in US waters need to carefully plan their voyages in order to unload their cargo at a port that can handle all US-bound cargo in one stop. Even if it were significantly more efficient to unload cargo bound for either the East Coast or West Coast at ports on those respective coasts, a transpacific ship cannot make both of those stops. If the majority of the cargo is bound for the East Coast, the ship will stop in the East, or vice versa. Movement of the remainder of the cargo must be taken up by truck or rail, or the remaining cargo must be loaded onto a separate ship and continue its voyage from there. In the case of domestic water-based transportation, this different ship is only used out of necessity and often generates costly market disruptions.

Between Alaska and Washington, only two carriers exist that meet all the qualifications to ship goods by water between the states.[45] Discussions of concentration measures of 60 percent and HHI values of 1,400 in international markets seem beside the point when a domestic market is captured by a verifiable duopoly. Because of this duopoly, prices for nearly all goods in Alaska are artificially high, and there is no legal avenue for international water-based shipping companies to enter the market and compete.

More generally, the restriction on shipping between US ports to a small subset of vessels is the nail in a supply chain's coffin, but each Jones Act provision distorts the market for shipping services in a distinct way. Before highlighting the benefits of a complete repeal of the Jones Act and the effect of such a repeal on the competitiveness of shipping in the American market, it is worth discussing the competition-limiting aspects of each provision independently.

The Jones Act requirement that ships be US built is aimed at maintaining a capable and thriving shipbuilding sector in the United States. Unfortunately, ships built in America are far too expensive and far too behind the curve technologically to compete with the rest of the world. Although competition with the rest of the world is not an explicit goal of the policy, it is still worth noting that no other country is coming to American shipbuilders for ships; the American domestic water-based shipping market is the only market where these ships are used.

According to a 2019 Congressional Research Service report, the cost of a Jones Act–compliant ship is between four and five times the cost of a comparable ship made in South Korea, China, or Japan.[45] This additional cost is not accounted for by a special technological advantage or additional value bestowed by the American manufacturing sector. Jones Act–compliant ships, on average, are less technologically advanced, costlier to operate, and present more dangerous working environments. In a time when the water-based shipping industry has some of the safest working conditions of any blue-collar sector and the lowest carbon footprint for shipping goods around the world, Jones Act ships are stuck in the mid-20th century.

These problems contribute to the higher costs of Jones Act ships. In crude ferrying markets, whereby crude oil is taken by water to refineries around the world, hiring a Jones Act ship is three to four times as expensive as a non–Jones Act ship.[46] These additional costs include the high price of the ship, but they also include the cost of additional fuel and the high price of labor.

The crewing costs on a Jones Act ship are estimated to be in the realm of six times that of hiring a crew that is not compliant with the Jones Act.[47] This cost is partially because of the high cost of American labor compared with foreign labor. Jones Act ships are also older and less safe, leading to worse working conditions and a higher likelihood of injury for the crew.[48]

These restrictions result in less efficient supply chains. Cargo coming from outside the United States must first be offloaded completely at a US port and then reloaded onto a different ship if further interstate ocean transportation is desired. This process significantly increases costs and turnaround time at ports. Another frequently used option is to unload the cargo and simply put in on a truck, sending it on its way by road instead of sea, even if the cargo's destination is close to another port. This, too, however, results in inefficiencies because reloading the cargo onto trucks for transportation out of the port takes time. As we note in a previous policy brief,

> The size of the Jones Act–eligible fleet exacerbates these limitations. According to the US Department of Transportation, the Jones Act–eligible fleet capable of oceangoing voyages comprised just 96 ships as of 2021. This is minute in comparison to the world merchant fleet, which, as of 2019, contained 43,779 ships, leaving the United States with a 0.4 percent share of the world total. Under the Jones Act, only these 96 ships may transport goods between domestic ports by ocean.
>
> If the restrictions were removed, port efficiency would skyrocket. Ships would be able to unload only the cargo bound for that single port, leaving the remaining cargo untouched, and proceed to the next port. Even better, intraport cargo could be loaded in the place of the unloaded cargo, removing the need to transport cargo between ports by rail or truck.
>
> At this time, ports are suffering from overcrowding and an inability to unload and reload ships quickly enough. Even worse, ports are being used as storage facilities for empty

ships and cargo containers, waiting for enough cargo so that they can finally make a return voyage. These ships, left in wait for an economically viable return trip, could be used for domestic shipping up, down, and between the US coasts.

This minimal reliance on shipping infrastructure raises shipping prices and strains supply chains within the country. As of 2017, only 2 percent of US domestic freight was transported by sea, in large part owing to the Jones Act restrictions. In the European Union, where there is no such restriction on freight transportation among member countries, that figure is closer to 40 percent. Without the sufficient scale to reduce per-unit costs in the ocean-shipping market, prices will remain high.

Land-based freight prices have hit all-time highs in recent months, and alternative means of shipping would reduce the pressure on these delicate supply chains. Reducing these artificial barriers to competition and using waterborne transportation of cargo could relieve pressure on supply chains, reduce costs, and ultimately benefit consumers by making products available more quickly and at lower costs.[49]

Whereas there may be the perception of concentration in the ocean-based shipping industry because of the "small" number of firms operating in the market, the real concentration story exists in monopolized markets around the country where the Jones Act has eliminated competition and shielded local firms from international market forces. By not exempting noncontiguous states and territories, the federal government exacerbates inequality in these markets by raising prices and reducing the availability of shipping services. Furthermore, by keeping the act in place after 100 years, the federal government is artificially keeping prices high and limiting supply.

A POST–JONES ACT WORLD

A post–Jones Act world is not difficult to imagine, given that other sectors of the economy already live in such a world. Up and down America's inland rivers, foreign-flagged and foreign-built ships make voyages every day to deliver goods, especially along the Mississippi River.[50] The only change in a post–Jones Act world is that these ships would be able to make more than one domestic stop. This would allow a single ship to drop off cargo at ports all the way along inland waterways, making its voyages significantly more efficient and allowing for a greater diversity of goods to be shipped.

Mega ships would also be able to service more than one domestic costal port, which would allow for intraport movement of cargo and reduced loading and unloading times, given that mega ships only unload locally demanded cargo at each port. This would take a significant burden off truck and rail infrastructure, allowing for shorter journeys between the port and the cargo's final destination and reducing domestic delivery time.

Additionally, the increase in international competition would have the effect of bidding down domestic shipping prices. Without any market power in the domestic market, incumbent shipping companies would be unable to charge higher prices for less efficient shipping services. These companies would be forced to innovate for the first time in decades, leading to better outcomes for consumers and lower prices.

Some argue that without the Jones Act, the domestic shipbuilding industry would be eliminated, and with it would go scores of well-paying jobs.[51] This assertion is entirely misguided. Nearly 80 percent of shipbuilding revenue comes from government contracts,[52] with an additional amount coming from maintenance and repair of existing ships. Neither of these revenue streams has anything to do with the Jones Act and would not go away were the law to be repealed. Economist Colin Grabow at the Cato Institute suggests that shipbuilders do the following after a repeal of the Jones Act:[53]

- Increase ship repair and maintenance business.
- Still build ships, but with less expensive, non-US inputs.
- Specialize in the production of one (or a few) specific types of ships.[54]

Grabow posits that shipbuilders, facing international competition, would go much the way of the domestic automaker: more productive, more competitive, and able to lower costs, leading to lower prices for consumers.

CONCLUSION

We agree with Grabow: the Jones Act is a burden that America can no longer bear.[55] For far too long the concentration and market capture afforded to US shipbuilders and shipping firms has distorted the market for shipping services. In a time when shipping prices are at record highs, wait times for goods are measured in months and years, and store shelves are bare, the market is overdue for a shot of competition.

This competitive booster is precisely what the Biden administration is asking for, but its focus is entirely misguided. On June 16, 2022, the president signed into law the Ocean Shipping Reform Act, promising to crack down on price hikes, strengthen supply chains, and reduce costs for consumers.[56] Documents from his own FMC, however, refute the central premise of the law. Ocean-based shipping is not concentrated, and the increases in prices seen during the pandemic are a result of unfettered demand, not anticompetitive conduct.

If the administration genuinely wants to increase competition in shipping markets and reduce prices, then a repeal of the Jones Act is a great place to start. If, however, the administration wants to continue to crack down on large companies—while protecting special interests and maintaining a century of regulatory capture in the shipping industry—then it should keep going steady.

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NOTES

1. White House, "Fact Sheet: Lowering Prices and Leveling the Playing Field in Ocean Shipping," press release, February 28, 2022, https://www.whitehouse.gov/briefing-room/statements-releases/2022/02/28/fact-sheet-lowering-prices-and-leveling-the-playing-field-in-ocean-shipping/.

2. A whole-of-government approach to regulation generally tasks agencies not traditionally associated with the enforcement of a set of regulations with creating policies aimed at achieving a desired policy goal. In this case, agencies outside of the Federal Trade Commission and Department of Justice (the traditional enforcers) are being asked to put forward procompetitive policies. See Exec. Order No. 14,036, 86 Fed. Reg. 36,987, 36,991–92 (July 14, 2021). "This order recognizes that a whole-of-government approach is necessary to address overconcentration, monopolization, and unfair competition in the American economy . . . . Agencies can and should further the polices set forth in section 1 of this order by, among other things, adopting pro-competitive regulations and approaches to procurement and spending, and by rescinding regulations that create unnecessary barriers to entry that stifle competition."

3. Exec. Order No. 14,036, 86 Fed. Reg. 36,987, 36,991–92 (July 14, 2021).

4. Alden F. Abbott and Andrew L. Mercado, "Reining In Market-Distorting Federal Regulation" (Mercatus Policy Brief, Mercatus Center at George Mason University, Arlington, VA, January 2022). This brief focuses on the competition- and market-distorting aspects of the act, with particular emphasis on major developments over the past few years. It builds upon a detailed economic critique of the act set forth in previously published Mercatus scholarship. For an in-depth discussion of these topics, see Thomas Grennes, "An Economic Analysis of the Jones Act" (Mercatus Research, Mercatus Center at George Mason University, Arlington, VA, May 2017); and Thomas Grennes, "The Jones Act Revisited" (Mercatus on Policy, Mercatus Center at George Mason University, Arlington, VA, December 2017). In addition to detailing the act's harmful economic effects, Grennes's research also ably dissects the flaws in the protectionist and national security justifications for the act. Those flawed justifications are not discussed in this brief.

5. White House, "Fact Sheet: Lowering Prices."

6. "Shipping Profit Margins Accelerate," *Global Maritime Hub*, November 2021.

7. "Shipping Profit Margins Accelerate."

8. Howard Schneider, "Much of 'Trump Country' Was in Recession during 2016 Campaign: Data," *Reuters*, December 18, 2019; and Mercy A. Kao, "US-China Trade Tariffs: Impact on Shipping Industry," *The Diplomat*, October 3, 2018.

9. "It is important to begin by discussing the shipping cycle. The [shipping cycle] is understood as the interaction between supply and demand in the maritime transport sector. Supply will lag behind when facing extremely dynamic exogenous demand. In this situation, the industry needs to adapt the shipping fleets (by expanding or contracting) to changes in demand." Ricardo J. Sanchez, *The Shipping Cycle in the International Container Market: Which Will Be the Actual Shipping Cycle in the Future of Shipping, the Traditional or a New One?* (Santiago, Chile: United Nations Economic Commission for Latin America and the Caribbean, 2017).

10. A quasi-rent, as originally described by Alfred Marshall, is the additional price paid to the owner of a stock of capital in excess of the opportunity cost of that capital for a limited period of time. See Alfred Marshal, "On Rent," *Economic Journal* 3, no. 9 (1893): 77; see also Bryan Caplan, "What Is a Quasi-Rent?," George Mason University, accessed July 18, 2022, https://econfaculty.gmu.edu/bcaplan/quasi-rent.

11. In the long term, as new firms enter the market, demand subsides, or both, this quasi-rent will be reduced and tend toward zero.

12. White House, "Fact Sheet: Lowering Prices."

13. "Comparing Unemployment Rates by Race: The Great Recession vs. COVID-19," *FRED Blog* (Federal Reserve Bank of St. Louis), May 23, 2022.

14. Susan Lund et al., *Lives and Livelihoods: Assessing the Near-Term Impact of COVID-19 on US Workers* (Washington, DC: McKinsey Global Institute, 2020).

15. Akrur Barua, "A Spring in Consumers' Steps: Americans Prepare to Get Back to Their Spending Ways," *Deloitte Insights*, June 28, 2021.

16. "How COVID–19 Has Transformed Consumer Spending Habits," J.P.Morgan, last updated November 23, 2020, https://www.jpmorgan.com/solutions/cib/research/covid-spending-habits.

17. Lisa Schnirring, "WHO Warns of PPE Shortage; COVID Pace Slows Slightly in China," *CIDRAP News* (Center for Infectious Disease Research and Policy), February 7, 2020.

18. Tinglong Dai, Ge Bai, and Gerard F. Anderson, "PPE Supply Chain Needs Data Transparency and Stress Testing," *Journal of General Internal Medicine* 35, no. 9 (2020): 2748–49.

19. Lazaro Gamio and Peter Goodman, "How the Supply Chain Crisis Unfolded," *New York Times*, December 5, 2021.

20. Gamio and Goodman, "How the Supply Chain Crisis Unfolded." Before the pandemic, blank sailings accounted for up to 21 percent of all voyages.

21. Gregory LaRocca, *Rising Maritime Freight Shipping Costs Impacted by Covid-19* (Washington, DC: US International Trade Commission, 2021).

22. Anshu Siripurapu, "What Happened to Supply Chains in 2021?," Council on Foreign Relations, December 13, 2021, https://www.cfr.org/article/what-happened-supply-chains-2021; Ari Ashe, "Port of Virginia Marks Strong Recovery with Record September," Journal of Commerce, October 1, 2020, https://www.joc.com/port-news/us-ports/port-virginia/port-virginia-marks-strong-recovery-record-september-volume_20201001.html.

23. White House, "Fact Sheet: Lowering Prices."

24. White House, "Fact Sheet: Lowering Prices."

25. International Transportation Forum, *The Impact of Mega-Ships* (Paris: Organisation for Economic Co-operation and Development, 2015), 18.

26. International Transportation Forum, *The Impact of Mega-Ships*.

27. International Transportation Forum, *The Impact of Mega-Ships*.

28. International Transportation Forum, *The Impact of Mega-Ships*, 22.
29. International Transportation Forum, *The Impact of Mega-Ships*.
30. International Transportation Forum, *The Impact of Mega-Ships*.
31. Operational costs are costs incurred when loading, unloading, and processing the containers on a ship. International Transportation Forum, *The Impact of Mega-Ships*.
32. International Transportation Forum, *The Impact of Mega-Ships*.
33. International Transportation Forum, *The Impact of Mega-Ships*, 28.
34. International Transportation Forum, *The Impact of Alliances in Container Shipping* (Paris: Organisation for Economic Co-operation and Development, 2018), 20.
35. International Transportation Forum, *The Impact of Alliances*.
36. International Transportation Forum, *The Impact of Alliances*, 37.
37. International Transportation Forum, *The Impact of Alliances*.
38. International Transportation Forum, *The Impact of Alliances*, 38–39.
39. Federal Maritime Commission, *Effects of the COVID-19 Pandemic on the U.S. International Ocean Supply Chain: Stakeholder Engagement and Possible Violations of 46 U.S.C. § 41102(c)*, May 31, 2022, 44.
40. Federal Maritime Commission, *Effects of the COVID-19 Pandemic*.
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42. Federal Maritime Commission, *Effects of the COVID-19 Pandemic*, 45.
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