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THE JONES ACT A LEGACY OF ECONOMIC RUIN FOR PUERTO RICO

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Puerto Rico
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The Jones Act: A Legacy of Economic Ruin for Puerto Rico

Executive Summary:

The Merchant Marine Act of 1920 was passed by Congress and enacted into law nearly 100 years ago. Section 27 of the Merchant Marine Act is known as the Jones Act after its sponsor, Senator Wesley Jones, from Washington State. It serves as the cabotage law of the United States and requires that all goods transported by water between destinations in the country and its territories, be carried on U.S.-flagged ships, that are constructed in the country, and are owned and substantially crewed by US citizens.

This legacy of the roaring 20's continues to limit the ability to ship products by water throughout the United States and Puerto Rico. These effects are significant and have led to a number of unintended consequences. In fact, rather than achieving any of the goals set forth in 1920, the Jones Act has severely hampered the development of the merchant marine and shipbuilding industries in the United States, has reduced waterborne coastwise trade, has increased prices, harmed the environment, and over time has measurably harmed the economy of the Commonwealth of Puerto Rico.

Because of the Jones Act, firms in Puerto Rico have limited shipping options, leading consignees in these areas to purchase more from foreign sources (Puerto Rico for example imports almost no heavy cargo from the US since ships are not available to carry it). This not only impacts prices for consumers, but also economic activity in these jurisdictions.

Table 1
Total Shipping Cost Differentials to Puerto Rico Resulting From the Jones Act – By Example

	Bulk	Containerized
Example 1	61.9%	88.9%
Example 2	67.5%	67.5%
Example 3	79.1%	28.9%
Example 4	41.0%	41.0%
Example 5	60.0%	60.0%
Average	61.9%	57.3%
Recommended	58.8%	88.9%

Dozens of studies have attempted to document these costs; however, the lack of public data sources has impeded the ability of researchers to fully examine how the Jones Act has affected Puerto Rico. This analysis uses a model of international shipping costs for 260 different commodities (both containerized and non-containerized) and compares this with 6 different estimates of domestic (US flag) shipping cost differentials. In doing this, both distance and terminal handling charges are controlled for. The results show that no matter what model is used, it is more expensive on an apples to apples basis to ship on Jones Act carriers than foreign-flagged vessels. Table 1 shows that these cost differentials range from a high of 89 percent to a low of just under 30 percent.¹ On average, based on the models examined, the cost differential for shipping containerized cargo is 57.3 percent, and 61.9 percent for non-standard or bulk cargos.

These higher costs not only impact importers in Puerto Rico, but they flow throughout the economy, effecting manufacturers, businesses and consumers. Using JDAs recommended model, the price of

¹ Throughout this analysis the models work based on cost differentials which are equal to the percentage change in shipping costs were the Jones Act to be eliminated. Mathematically, the differential is different than the percentage difference between the future rate and the current rates. For example, based on a recent survey conducted by Advantage Business Consulting, it costs on average \$3,027 to ship containerized food products to Puerto Rico on a Jones Act carrier, and \$1,206 for a similar shipment internationally. The percentage DIFFERENCE in these costs is about 151 percent $((3027-1206)/1206) = 1821/1206 = 1.51$. The DIFFERENTIAL is equal to the percentage change in cost for shifting from a Jones Act carrier to a free market rate. This would be about 60 percent $((1206-3027)/3027) = -1821/3027 = .602$.

shipping cargo to Puerto Rico is \$568.9 million higher, and prices are \$1.1 billion higher than they would be without the Jones Act limitations. This is equal to nearly \$375 per resident.²

Table 2
Economic Impact of Jones Act Restrictions on Imports – By Example

	Increased Shipping Costs	Total Increased Costs	Cost Per Resident	Lost Jobs	Lost Wages	Lost Economic Activity	Lost Taxes
Example 1	\$ 742,321,800	\$ 1,199,368,400	\$ 375.37	13,270	\$ 338,273,740	\$ 1,467,480,700	\$ 106,771,496
Example 2	\$ 582,992,400	\$ 938,185,900	\$ 293.63	10,300	\$ 263,800,810	\$ 1,146,284,760	\$ 83,450,660
Example 3	\$ 305,096,600	\$ 477,301,800	\$ 149.38	5,100	\$ 132,429,110	\$ 579,695,510	\$ 42,287,440
Example 4	\$ 354,113,900	\$ 569,861,100	\$ 178.35	6,250	\$ 160,234,570	\$ 696,261,860	\$ 85,588,970
Example 5	\$ 518,215,400	\$ 833,943,000	\$ 261.00	9,150	\$ 234,489,610	\$ 1,018,919,790	\$ 74,178,359
Average Differential	\$ 500,548,020	\$ 803,732,040	\$ 251.55	8,814	\$ 225,845,568	\$ 981,728,524	\$ 78,455,385
Recommended	\$ 739,594,300	\$ 1,195,441,200	\$ 374.14	13,250	\$ 337,284,560	\$ 1,462,919,480	\$ 106,431,612

If this is the case, Puerto Rico has 13,250 fewer jobs than it would have were there a free market for ocean freight. These jobs would pay residents \$337.3 million more in wages, and would result in over \$1.5 billion in increased economic activity.

Overall tax revenues would be \$106.4 million higher were the island be exempted from the Jones Act's provisions.

In sum, no matter how one looks at it, the Jones Act is a contributor to the poor economic situation in the Commonwealth of Puerto Rico.

² 3,195,153 people as of July 1, 2018.

Introduction and History of the Jones Act:

The Merchant Marine Act of 1920 was passed by Congress and enacted into law nearly 100 years ago.

In passing the Act, Congress intended to ensure a substantial maritime industry for national defense purposes. The Act states:

It is necessary for the national defense and for the proper growth of its foreign and domestic commerce that the United States shall have a merchant marine of the best equipped and most suitable types of vessels sufficient to carry the greater portion of its commerce and serve as a naval or military auxiliary in time of war or national emergency, ultimately to be owned and operated privately by citizens of the United States.³

Section 27 of the Merchant Marine Act is known as the Jones Act after its sponsor, Senator Wesley Jones, from Washington State. It serves as the cabotage law of the United States and requires that all goods transported by water between destinations in the country and its territories, be carried on U.S.-flagged ships, that are constructed in the country, and are owned and substantially crewed by US citizens.

While cabotage laws of some type are fairly common across the world, and have been part of the US transportation system since the first Congress, the Jones Act is stricter than most, and over the course of the last 100 years has done little to develop or maintain a vibrant *merchant marine of the best equipped and most suitable types of vessels sufficient to carry the greater portion of its commerce*. Rather, according to the Maritime Administration (MARAD), there were only 180 US flagged vessels operating in the oceans in 2018, down from almost 1,140 in 1954. The capacity of these ships is down by 42.5 percent during this same period.⁴

Congress has loosened the cabotage laws slightly over time. In 1936, the US Virgin Islands were exempted from the Jones Act. American Samoa was exempted in 1934, as were the Northern Mariana Islands in 1976. Guam was partially exempt from the Act in 2006, when a limited number of foreign built ships were allowed to serve the island from US territories. In addition, in 2006, the law was changed to allow for 25 percent foreign ownership, content or crewing of vessels.⁵

Other limited exemptions have been enacted over the years. For example, in 1947, Canadian- flagged vessels were allowed to perform intercoastal service to the town of Hyder, Alaska,⁶ and waivers of the Act have been granted on a case-by-case basis in times of national emergency (e.g. following a hurricane) or for specific individual shipments of project cargo. These waivers, however, only lasted for a few days or months depending on the nature of the emergency.⁷

In spite of these specific exemptions, this legacy of the roaring 20's continues to limit the ability to ship products by water throughout the United States and Puerto Rico. These effects are significant and have led to a number of unintended consequences. In fact, rather than achieving any of the goals set forth in 1920, the Jones Act has severely hampered the development of the merchant marine and shipbuilding industries in the United States, has reduced waterborne coastwise trade, has increased prices, harmed the environment, and over time has measurably harmed the economy of the Commonwealth of Puerto Rico.

The remainder of this paper examines these unintended consequences, particularly as they relate to the Puerto Rican economy.

³ 46 USC Subtitle V: Merchant Marine, §50101. Objectives and policy

⁴ US Department of Transportation, Maritime Administration, *United States Flag Privately-Owned Merchant Fleet Report Oceangoing, Self-Propelled Vessels of 1,000 Gross Tons and Above that Carry Cargo from Port to Port*, November 20, 2018 and *U.S.-Flag Privately-Owned Merchant Fleet, 1946-Present Oceangoing Self-Propelled Vessels of 1,000 Gross Tons and Above*, at: <https://www.maritime.dot.gov/data-reports/data-statistics/data-statistics>

⁵ 46 USC Subtitle V: Merchant Marine, §55101, and §55104

⁶ 46 USC Subtitle V: Merchant Marine, §55121

⁷ *Waivers of Jones Act Shipping Requirements*, EveryCRSReport.com, September 29, 2017, at: <https://www.everycrsreport.com/reports/IN10790.html>

The Unintended Consequences of the Jones Act

While some may disagree with certain laws or regulations, it is disingenuous to think that members of Congress set out to cause economic harm when they sponsor legislation. This is as true today as it was in 1920, when Senator Wesley Jones, a Member of Congress and Senator for 30 years, sponsored the Jones Act. Jones represented the State of Washington, and his sponsorship of the Merchant Marine Act was likely due to his parochial desire to promote the ship building industry in Seattle and to also ensure that the then-territory of Alaska was dependent on Seattle-based shipping.

So, from its beginning, the Jones Act was designed to pick winners and losers. And while it may have been seen as having only a limited effect at a time when the country had 640 shipyards, and 27.5 percent of the world merchant fleet (by tonnage) consisted of US flagged vessels, as times have changed, so has the impact of the Jones Act on the economy.⁸

Looking first at the stated goal of the law, an article by Senator Jones published in 1922, states that not protecting shipping would *overlook the terrible experience that came to us at the beginning of the world war*. He stated that, *when the war came this lack of shipping cost us hundreds of millions of dollars in higher freight rates or business losses and hundreds of millions of waste in the hasty building of ships to meet the emergency that threatened the overthrow of civilization, and today the papers are filled with stories of waste, corruption and inefficiency that was the inevitable result of the conditions and the situation that confronted us.*⁹

He also stated, *we do desire to build up a merchant marine ample to do the major part of our own ocean-carriage and that part of the world's carrying commensurate with our wealth, power and standing among the nations of the world. This is necessary for our commercial growth, our national defence (sic.) and national independence, and it is necessary for the world's peace and safety. If one nation dominates the shipping of the world it holds the destinies of all peoples in its grasp.*

Looking at these three quotes, the Congress enacted the provisions of the Jones Act with the expectation that they were doing something that would not only help to build a stronger merchant marine, but one that would have sufficient capacity to handle war time needs, and that would have the capacity to carry a significant part of the world's international cargo.

Unfortunately, rather than helping to enhance shipping, shipbuilding and the merchant marine in the United States, the Jones Act has coincided with the dismantling of the industry. When the Jones Act was enacted 2,752 merchant ships¹⁰ sailed under the US flag. Today this is down to just 181 Jones Act eligible vessels.¹¹ In 1920, ships with a GRT of 3,880,630¹² were constructed in the United States, in 2017, just 225,593 GRT of ships were constructed, a 94 percent decrease.¹³ According to the Maritime Administration, the US flag fleet carries just 1.5 percent of all international waterborne freight, a far cry from Senator Jones' call for the American Merchant Marine to be carrying *that part of the world's carrying commensurate with our wealth, power and standing among the nations of the world.*¹⁴

In the 1920s, employment on American Flagship vessels numbered in the 60,000s and as of 2017, that number is one-sixth of what it was nearly a century ago at 10,000 jobs. Likewise, the number of oceangoing merchant vessels made in US shipyards has dropped from 467 in 1920 to 12 in 2018. In 1955, the US fleet accounted for roughly 25 percent of the worlds shipping vessels by tonnage¹⁵; by 2016 that number was 0.4 – less than one half of one percent. The number of large shipyards in America, 30 over

⁸ 1930 data from Statistical Abstract of the United States

⁹ Jones, Wesley, *The Merchant Marine Act of 1920*, [Proceedings of the Academy of Political Science in the City of New York](https://books.google.com/books?id=JgoZAAAAAYAAJ&pg=PA233#v=onepage&q&f=false), Volume 9, 1922, <https://books.google.com/books?id=JgoZAAAAAYAAJ&pg=PA233#v=onepage&q&f=false>

¹⁰ 1,000 Gross Registered Tons or more.

¹¹ 1920 data from Statistical Abstract of the United States

¹² 1922 data from Statistical Abstract of the United States

¹³ UNCTADSTAT, Ships built by country of building, Annual, 2014-2017
<http://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=89493>

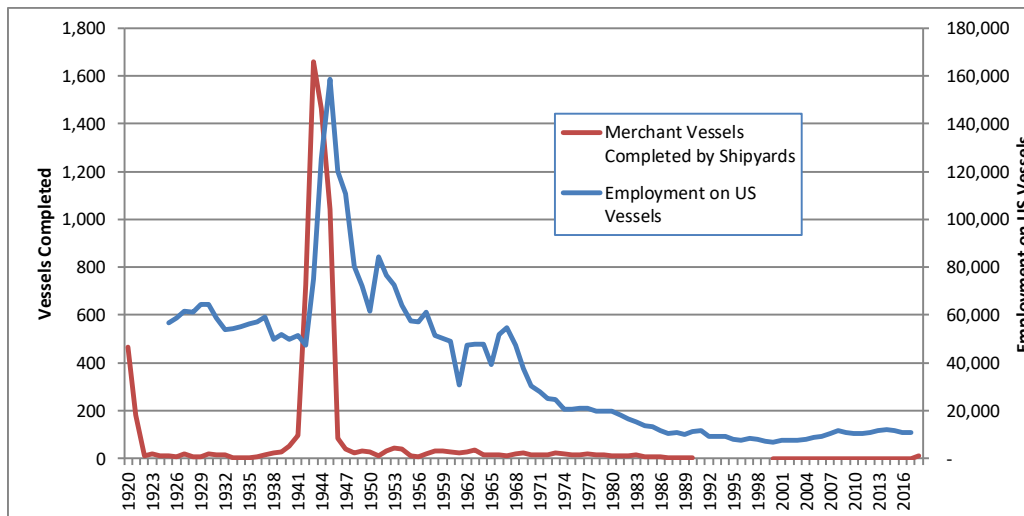
¹⁴ Op. cit., Jones, Wesley.

¹⁵ Cato Institute, The Jones Act Strikes Again, July 27, 2015, <https://www.cato.org/blog/jones-act-strikes-again>

67 years ago, reached a low of 6 in 2016 and the number of large ships they build each year has dropped from 60 to 7.¹⁶ In addition, there are several of the largest shipyards, including Philly Shipyard, VT Halter, and Nassco that are not even wholly owned by US parent companies, but rather by foreign operators, hardly something that the authors of the Jones Act considered.¹⁷ Furthermore, the total number of merchant ships in the US fleet is less than half of what it was in 1990.

While the Jones Act naturally ensured that a few more American vessels would be used in domestic trading, the industry's labor market was crushed. From 1925 to 1965, only about 4,000 more American ships were being used in domestic transport, but the industry saw a decline in employment of 16,000. With the exception of the Second World War, that employment decline continues to this day while a coddled shipping industry cannot compete with foreign carriers.

Figure 1
US Flag Merchant Vessels Completed and Merchant Marine Employment



Sources: Statistical Abstract of the United States 1920-2016

According to MARAD, the average daily operating costs for American vessels in 2011 were about 3 times higher than comparable vessels in other countries.¹⁸ Drewry Maritime Research found that Jones-compliant vessels cost roughly 4 times as much to build as comparable foreign ships.¹⁹ Over time, nearly all US based carriers have substantially exited the Jones Act Trade.

In addition to the detrimental effects the Jones Act had on the shipping industry itself, there may have been more unforeseen consequences. For example, a flour mill may find it cheaper to import grain from other countries rather than buy from US grain companies, thus hurting US granaries. It is also more expensive for US producers to sell to Puerto Rico, an American territory. In fact, based on shipping alone, US producers face cheaper exports to other Caribbean islands than they do to Americans in Puerto Rico. Even with the US shipping record amounts of natural gas internationally, not a single US flagged ship transports liquid natural gas. Likewise, in the 1950s, the share of overseas commercial traffic that was US owned was 50 percent and by the late 1980s it dwindled to 5 percent.²⁰ Finally, the number of

¹⁶ The Decline of US Shipbuilding. <http://shipbuildinghistory.com/statistics/decline.htm>

¹⁷ Riley, Bryan, "Are Jones Act Ships really 'Made in the USA?' Well, Sort of" <https://thehill.com/blogs/pundits-blog/transportation/282455-are-jones-act-ships-really-made-in-the-usa-well-sort-of>

¹⁸ Ibid.

¹⁹ Drewry Maritime Research, US Cabotage Protection Gets More Expensive, at: <https://www.tradewindsnews.com/incoming/327687/drewrycabotage-protection-gets-more-expensivepdf/BINARY/Drewry-Cabotage%20protection%20gets%20more%20expensive.pdf>

²⁰ Loren Thompson, Trump Industrial Policy Likely To Target U.S. Commercial Shipbuilding & Merchant Fleet For Revival, <https://www.forbes.com/sites/lorenthompson/2018/06/05/trump-industrial-policy-likely-to-target-u-s-commercial-shipbuilding-merchant-fleet-for-revival/#2bed3935fd1e>

trained and licensed mariners in the country has declined from 61,430 individuals to just 10,671.^{21,22} At the same time, the overall US labor force has increased by 225 percent.^{23,24}

In addition, the loss of shipbuilding in the US preceded a dramatic decline in domestic steel and aluminum production. Metals account for about 7.2 percent of the cost of a ship, so a \$200 million dollar freighter would contain almost \$14.4 million worth of steel and other metals.²⁵ In 1920, the United States produced 55 percent of the world's iron and steel.²⁶ By 2016, this had fallen to just 4.8 percent.²⁷ It is not a coincidence that the countries that build most of the world's ships, also produce a large percentage of its basic metals.

More importantly than the negative impacts on the maritime industry, the Jones Act has changed the transportation system of the United States in a number of ways. With limited inter-port shipping options, more cargo must travel over land, either by rail or truck. This leads to more congested roadways, more fuel use, and potentially more pollution. In addition, people are not able to efficiently travel by water. Where there were once hundreds of ships moving people along America's waterways and coasts, today only a few small vessels remain.

Because of the Jones Act, outlying territories like Alaska, Hawaii and Puerto Rico have limited shipping options, leading consignees in these areas to purchase more than they otherwise would from foreign sources (Puerto Rico for example imports almost no heavy cargo from the US since ships are not available to carry it). This not only impacts prices for consumers in these jurisdictions, but also negatively impacts the country's balance of trade.

The rest of this analysis examines the impact of higher shipping costs on the Puerto Rican economy.

²¹ 1925 data from Statistical Abstract of the United States

²² Bureau of Labor Statistics, Quarterly Census of Employment and Wages, NAICS 483113, January 4, 2019, <https://data.bls.gov/pdq/SurveyOutputServlet>

²³ 1930 data from Statistical Abstract of the United States

²⁴ Bureau of Labor Statistics, Labor Force Statistics from the Current Population Survey, January 4, 2019, <https://data.bls.gov/timeseries/LNS11000000>

²⁵ Based on data from IMPLAN, Inc. for the shipbuilding industry in the United States. 2016 Input Output Tables.

²⁶ US Geological Survey, Iron and Steel Statistics, January 19, 2017, <https://minerals.usgs.gov/minerals/pubs/historical-statistics/>

²⁷ United States Geological Survey, *USGS and Advance Data Release of the 2016 Annual Tables*, November 13, 2018

The Jones Act and Puerto Rico:

Puerto Rico is the only US territory that is fully subject to the provisions of the Jones Act.²⁸ It is also an island, so the only way that it can receive the bulk of shipments from the continental United States is via marine commerce. In fact, marine commerce accounts for 98 percent of Puerto Rico's imports by weight, versus just 2 percent by air.²⁹

According to MARAD, only 96 ships are available to serve the entire US coastwise trade, or trade between the mainland and Alaska, Hawaii and Puerto Rico. Of these, there are only 2 small dry bulk carriers, and 9 general cargo vessels.

Table 3
Ships Available to Serve the Domestic Jones Act Controlled Market

Ship Type	Number of Vessels	GT	DWT
Containership	21	641,906	686,810
Dry Bulk	2	44,252	73,658
General Cargo	9	18,565	15,602
Ro-Ro	7	314,608	139,288
Tanker	57	2,332,964	3,862,748
Total Jones Act Eligible	96	3,352,295	4,778,106

In addition to having only a limited number of vessels available to carry cargo to and from the Commonwealth, Puerto Rican shippers and consignees have access to only a tiny number of carriers that provide general cargo service from the US mainland to San Juan, or for that matter any other seaport facility on the island. The island is only served regularly from three ports – Houston, Jacksonville, and Philadelphia, with the majority of that service originating in, or destined to Jacksonville. This means that companies that wish to ship to the island must first send their cargo to one of these three ports of departure, even if the cargo itself is originating in a major port city like Los Angeles, Seattle or New York. All of this adds significant additional cost and time. Inland US freight costs are not included in this analysis as it is impossible to determine the origin of Puerto Rican bound cargo with existing data. While there are data on product shipments between the various states and Florida, this cannot be broken out between products bound for Puerto Rico or any other final destination, inland transportation costs in Puerto Rico are included in the analysis through the use of transportation margins.

Past Literature and Analysis:

The problems of the Jones Act have been discussed in the literature since as early as 1930, when scholars at the Brookings Institution stated that *American coastwise shipping laws are a handicap to Porto [sic] Rican trade*. This was because *Porto Rican imports and exports alike carry somewhat higher shipping rates than would be the case were Porto Rican traders free to utilize the cheaper carriers of other countries*.³⁰ While the Brookings analysis did not specifically document the size of the shipping cost differential, it does show that even 90 years ago there was a general understanding that the cabotage laws led to higher shipping costs and that these costs burdened the Commonwealth.

By the mid-1960s, researchers were beginning to make estimates of the cost of the Jones Act on Puerto Rican shipping rates. The models generally took two forms. The first examined the cost of operating vessels under a US flag versus a flag of convenience. The second type examines the limited publicly available data on freight costs, and compares those controlling for mileage. To date well over 40 different

²⁸ Outside of a few small and mostly uninhabited islands like Palmyra Atoll and Wake Island.

²⁹ In terms of value, the break is about even. 2017 U.S. Trade with Puerto Rico and U.S. Possessions, US Department of Commerce, Economics and Statistics Administration.

³⁰ Clark, Victor, et. al., *Porto Rico and Its Problems*, The Brookings Institution: Washington DC, 1930. On-line at: <https://quod.lib.umich.edu/p/philamer/agd9090.0001.001/7?page=root;size=100;view=image>

studies have been published directly examining the effect of the Jones Act on the US and the Puerto Rican economy; however, there is a sizable amount of cross-referencing between the studies, and there are just a few independent assertions about the cost differentials for bulk cargo and containerized cargo.

A total of about 30 reports or papers were examined prior to conducting this analysis. Of these, only about 20 presented any data at all, and most of these were either limited or simply repeated conclusions from an earlier work. In fact, a study produced by Simat, Hellieson, & Eichner, Inc. for the Alaska Statehood Commission in 1982, appears to be the original source for most studies examining containerized cargo,³¹ while research originally conducted by the US International Trade Commission (ITC), is likely the basis for most analysis of bulk-type cargos.³²

Operating Cost Studies:

A large number of studies examine the different operating costs between US flag vessels and those sailing under a foreign flag or flag of convenience. In addition to the Simat, Hellieson & Eichner study conducted for the State of Alaska, the US Government has used operating costs as a proxy for determining shipping costs. This was done by both the US International Trade Commission on a number of occurrences, and by the US Department of Transportation, Maritime Administration.³³

Other reports drafted both for Jones Act carriers, as well as for other interested parties have also examined vessel operating costs and have used these as a proxy for freight rates.³⁴ Still others simply repeat the information in the reports cited above.

Since little data on actual shipping costs is available from public or government sources, operating costs are a reasonable proxy to use in a comparative analysis. However, in a captive market like maritime transportation between Puerto Rico and mainland ports, carrier costs may not track closely with revenues. In this case, the three shipping lines moving general cargo between the mainland US and Puerto Rico have the opportunity to charge higher than average fees – what economists would call an economic rent – simply because lower cost carriers are not able to compete and hold prices down.

In the past, carriers in this trade have colluded to fix prices in violation of the Sherman Antitrust Act. An investigation by the Department of Justice led to guilty pleas by executives from the three largest water freight carriers serving routes between the continental United States and Puerto Rico. A number of these executives served prison sentences as a result of this collusion.³⁵ But illegal collusion is not necessary for companies in an oligopoly or a closed market to charge above market rates. General economic theory shows how firms in a market, like the Jones Act trade between the mainland and Puerto Rico, are incentivized to not compete simply because of the market structure, in effect tacit collusion.³⁶

³¹ Simat, Hellieson, & Eichner, Inc., *The Jones Act and Its Impact on the State of Alaska, Vol. II: Final Report*, prepared for the Alaska Statehood Commission, July 1982.

³² *The Economic Effects of Significant U.S. Import Restraints*, US International Trade Commission, Investigation No. 332-325: Publication 2699, November 1993.

³³ See for example, *The Economic Effects of Significant U.S. Import Restraints*, US International Trade Commission, Investigation No. 332-325: Publication 2699, November 1993; *The Economic Effects of Significant U.S. Import Restraints: Third Update 2002*, US International Trade Commission, Investigation No. 332-325, Publication 3519, June 2002 and *Comparison of U.S. and Foreign-Flag Operating Costs*, US Department of Transportation, Maritime Administration, September 2011

³⁴ See for example: *A Study on the Impact of Repeal of the Jones Act on the Economy of Puerto Rico*, Puerto Rico Management & Economic Consultants, Inc. for Navieras de Puerto Rico, June 1994, and Whitehurst, Clinton H., *American Domestic Shipping in American Ships: Jones Act Costs, Benefits, and Options*, (Washington, DC: American Enterprise Institute), 1985.

³⁵ *Former Sea Star Line President Sentenced to Serve Five Years in Prison for Role in Price-Fixing Conspiracy Involving Coastal Freight Services Between the Continental United States and Puerto Rico* Press Release, US Department of Justice, Office of Public Affairs, Friday, December 6, 2013, at: <https://www.justice.gov/opa/pr/former-sea-star-line-president-sentenced-serve-five-years-prison-role-price-fixing-conspiracy>

³⁶ In an oligopoly with a dominant firm, that controls the vast majority of the market share, a form of tacit collusion can arise. As the dominant firm adjusts prices, any smaller firms within the segment must follow suit to retain the small amount of market share they currently possess. When the dominant firm raises prices, competitors are justified in raising prices higher based on the actions of the price leader. In fact, higher prices may improve profitability for all firms.

Since the evidence shows that this particular market is not subject to price competition, it is unlikely that carriers will price like they would in a competitive market, where marginal revenues are equal to marginal costs. As such, using operating costs as a proxy is unlikely to show the actual price differential that would be charged.

Available Data Studies:

Very few studies analyze any form of actual data on shipping rates, or try to derive shipping rates from available information. The US International Trade Commission (ITC) has conducted a number of studies examining the cost of the Jones Act on the US economy based on a weighted average of *wet cargo* and *dry cargo* shipping rates. The wet cargo differential (105 percent) comes from the difference between the average U.S. price for shipping Alaskan North Slope crude petroleum to the U.S. West Coast, \$0.00447/ton-mile, and the average world price for a comparable tanker shipment transported an equal distance, \$0.00218/ton-mile.³⁷ The report states that the differential for dry cargo (10 percent) comes indirectly from a report by Simat, Hellieson, & Eichner, Inc. for the Alaska Statehood Commission in 1982. This report; however, bases all of its estimates on ship operating costs, so it is no different than the studies mentioned above. As such, the ITC report only provides a data-based differential for “wet cargo,” which is basically petroleum.³⁸

A study conducted for the Government Development Bank of Puerto Rico, examined published tariffs to determine price differentials for containerized cargo,³⁹ while two studies conducted by Reeve & Associates cite undisclosed “prices.” One of these studies did suggest that a container of canned food products would cost \$2,500 to ship to Puerto Rico from a US port.⁴⁰ Finally, a study by the Federal Reserve Bank of New York provides an estimate of the differential cost of shipping a 20-foot container of household and commercial goods (freight all kinds) from the east coast of the United States to Puerto Rico vs. either Jamaica or the Dominican Republic, of about 81 percent.

In addition to these, one of the works examining prices was a doctoral dissertation, which used survey data,⁴¹ and one study examined carrier financial statements.⁴²

As with the studies examining operating costs, these all use various proxy data to estimate actual freight rates. Interestingly, except for one of the studies conducted for the carriers, all of these authors suggest that the differential for containerized general cargo between Jones Act carriers and foreign flagged ships would be between 40 and about 100 percent. None of the studies that have been conducted on the effects of the cabotage laws on shipments between the continental US and Puerto Rico suggest that the Jones Act has led to lower shipping costs.

Puerto Rico Waterborne Trade:

Economic and commercial data related to the Puerto Rican economy is both slim and not organized in any consistent manner; however, the Government of Puerto Rico publishes detailed international trade

³⁷ Ibid.

³⁸ Throughout this analysis the models work based on cost differentials which are equal to the percentage change in shipping costs were the Jones Act to be eliminated. Mathematically the differential is different than the percentage difference between the future rate and the current rates. For example, based on a recent survey conducted by Advantage Business Consulting, it costs on average \$3,027 to ship containerized food products to Puerto Rico on a Jones Act carrier, and \$1,206 for a similar shipment internationally. The percentage DIFFERENCE in these costs is about 151 percent $((3027-1206)/1206) = 1821/1206 = 1.51$. The DIFFERENTIAL is equal to the percentage change in cost for shifting from a Jones Act carrier to a free market rate. This would be about 60 percent $((1206-3027)/3027) = -1821/3027 = .602$.

³⁹ *Study of the Economic Impact of Cabotage, and Alternative Strategies to Cabotage in US Trade*, E.G Frankel & Associates, prepared for the Government Development Bank of Puerto Rico.

⁴⁰ *Impact of the U.S. Jones Act on Puerto Rico*, Reeve & Associates and Estudios Técnicos, Inc., prepared for The American Maritime Partnership, July 2018.

⁴¹ Suarez-Gopmez, William and Auyala-Cruz, Jorge, *Maritime cabotage in Puerto Rico's agribusiness supply chain*, Doctoral Dissertation, Universidad ICESI, August 11, 2016.

⁴² Lewis, Justin, *Veiled Waters: Examining the Jones Act's Consumer Welfare Effect*, MPRA Paper No. 51469, November 16, 2013.

statistics every year. The 2017 version was recently released and it shows that about 53 percent of the island's overall trade by value was with the United States.⁴³ These figures represent both air and waterborne commerce, and are in value rather than in volume terms, which would be more reflective of the cost of the Jones Act requirements. Even so, they demonstrate the dependency of Puerto Rico on trade with the United States. It should also be noted that about 14.1 percent of the Commonwealth's imports from foreign countries consists of fuels and petroleum products that would come from the mainland United States if appropriate tankers were available. If these shipments were instead to come from the mainland, the US would account for 59.7 percent of imports.

Table 4
Puerto Rico Overall Trade: 2017

	Imports	Pct	Exports	Pct	Total	Pct
United States	\$ 24,588,955,654	53.2%	\$ 55,257,144,590	77.7%	\$ 79,846,100,244	68.1%
Virgin Islands	\$ 235,985,563	0.5%	\$ 294,994,042	0.4%	\$ 530,979,605	0.5%
Other Countries	\$ 21,378,921,049	46.3%	\$ 15,550,281,424	21.9%	\$ 36,929,202,473	31.5%
Total	\$ 46,203,862,266	100.0%	\$ 71,102,420,056	100.0%	\$ 117,306,282,322	100.0%

In addition, 35.87 percent of the value of cargo imported from foreign countries consists of organic chemicals. These products are used to produce pharmaceutical products for re-export and do not enter the general commerce of Puerto Rico.

The US Department of Commerce keeps consolidated statistics on both domestic and international trade to and from the San Juan Customs District. In addition, the privately available Port Import and Export Reporting System (PIERS) maintained by HIS Markit provides detailed data by shipment and consignee from international ports to Puerto Rico, including counts of the number of containers shipped, tonnage, and value of the cargo.⁴⁴

A number of important import commodities were shipped almost exclusively on foreign-flag carriers, meaning that rather than purchasing products from US based manufacturers and suppliers, Puerto Rican companies turned to foreign sources to avoid costly Jones Act carriers. These commodities included: Petroleum (91 percent), grains (97 percent), cement (99 percent), even beet sugar (95 percent).⁴⁵

Table 5
Puerto Rico Waterborne Trade: 2017 (short tons)

Sector	Foreign	Domestic	Pct Foreign
Agriculture	422,820	314,370	57.4%
Manufacturing	8,555,110	6,803,660	55.7%
Mining	1,895,620	161,860	92.1%
Other	378,890	619,560	37.9%
Total	11,252,440	7,899,450	58.8%

Note: Foreign Data are from Piers and Domestic from US Department of Commerce

The US Department of Commerce, Bureau of the Census reported that Puerto Rico imported over 7.899 million short tons of cargo from the mainland United States in 2017, valued at nearly \$39.944 billion.⁴⁶ The PIERS database also collects its data from manifests, and reports that about 11.252 million short tons of cargo was imported from foreign ports into Puerto Rico in 2017.⁴⁷

⁴³ *Puerto Rico External Trade Statistics: 2017*, Government of Puerto Rico, Office of the Governor, Planning Board, February 2018.

⁴⁴ PIERS: The Port Import/Export Reporting Service, IHS Markit, www.Piers.com

⁴⁵ *5 Year Cargo Report*, US Army Corps of Engineers, Institute for Water Resources, at: <http://cwbi-ndc-nav.s3-website-us-east-1.amazonaws.com/files/wcsc/webpub/#/report-landing/year/2016/region/2/location/2136>

⁴⁶ *2017 U.S. Trade With Puerto Rico and U.S. Possessions*, FT895/171, US Department of Commerce, Bureau of the Census, Economics and Statistics Administration.

⁴⁷ Op. cit. PIERS

Large percentages of cargo, particularly bulk cargo like that from the mining sector (oil, stone, etc.), and agricultural products come predominately via foreign ports. Overall, almost 60 percent of the cargo volume brought into Puerto Rico by water comes on foreign flagged vessels coming from outside of the United States. In the case of containerized general cargo, Jones Act qualified vessels dominate. According to a report by Reeve & Associates commissioned by the American Maritime Partnership, 73.8 percent of all containerized cargo shipped through Puerto Rico's ports was carried by Jones Act Carriers.⁴⁸

Thus, when measured by value and by number of containers, the US is the principal trade partner of the Island. Only when volume is considered do foreign ports dominate due in part to the lack of Jones Act eligible bulk cargo vessels.

Simply put, the economy of Puerto Rico is highly dependent on domestic and international trade, which is equal to 112.6 percent of its total GDP according to the World Bank. This compares to just 26.58 percent for the United States proper.⁴⁹ In other words, Puerto Rico actually imports and exports more each year than its total domestic production. This is why understanding the impact of the Jones Act is so important.

Model of International Shipping Rates:

Average international freight rates for products coming from the United States to Puerto Rico can be calculated from publicly available data. In addition, there are data available that can be used to determine the shipping method (containerized or bulk) for cargo in this trade.

Data from the US Department of Commerce, Bureau of the Census provides information on total shipments to Puerto Rico from both US and foreign ports. Foreign import data for the San Juan customs district (for the year 2017) was gathered from the USATrade database, which is maintained by the Census Bureau.⁵⁰ The database provides detailed data on the CIF value of cargo imported into Puerto Rico by HTS code and country of origin.⁵¹ This is the cost of the goods, the insurance paid and the freight paid. The average insurance rate for FAK (Freight all kinds) is about \$0.87 per hundred dollars.⁵² Removing this from the CIF figures gives an estimate of CFR or cost, plus freight value. The USATrade database also provides the manifest value of the cargo (the C part of CIF). The difference between this figure and the CFR figure provides an estimate of the average international freight cost per dollar of cargo.

These data are averaged across countries, and the commodities in the Census data are aggregated into 334 separate IMPLAN industry categories based on a bridge between the 4-digit HTS code, NAICS codes and IMPLAN codes. The use of IMPLAN codes provides a disaggregated and standardized way to code data from a range of sources, and also serves to assist in determining economic impacts from the differential costs.

Rates differ depending on if products are shipped as general cargo on containerships, or if it is shipped on bulk, break-bulk or RORO (Roll on Roll off) vessels. The PIERS data provides detailed information on every international shipment, including the form of the cargo and even the vessel that it is carried on. The percentages of containerized cargo to other shipment type from these international shipments is applied to the domestic shipments to provide a containerized/non-containerized break for each commodity type.

Based on these data, international freight rates average about 1.4 percent of the value of the cargo shipped. The calculated rates range from virtually zero to as high as 74 percent of the value of the cargo

⁴⁸ *Impact of the U.S. Jones Act on Puerto Rico*, Reeve & Associates and Estudios Tecnicos, Inc., prepared for the American Maritime Partnership, July 2018

⁴⁹ *Trade as a % of GDP*, World Bank, at: <https://data.worldbank.org/indicator/NE.TRD.GNFS.ZS?locations=US>

⁵⁰ On-line at: <https://usatrade.census.gov/>

⁵¹ The Incoterm CIF stands for Cost, Insurance and Freight. It

⁵² Basic Coverage Insurance Rates for International Shipments (Outside US & Canada). Source: www.cargoinsurancecenter.com. Accessed November 15, 2018. Cargo Insurance Center is provided by P.A.F Insurance Services LLC, a division (dba) owned by Pacific Atlantic Freight LLC, a licensed: Freight Broker, Freight Forwarder and Insurance broker.

depending on the specific commodity-country pairing. Appendix Table One presents data on the estimated international freight rate by IMPLAN category.⁵³

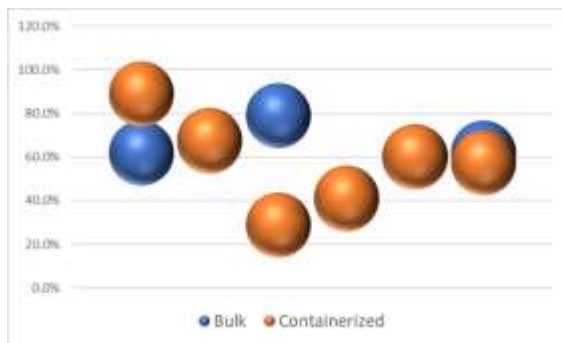
Various Calculations of Domestic Shipping Rates:

Over the past 50 years, scholars and government agencies have tried to calculate shipping rates for cargo moving to and from Puerto Rico. While this may seem straightforward, it is in fact a difficult exercise and little is known about the shipping costs charged to companies shipping products to Puerto Rico. The carriers in this trade are not required to publish contracts and published tariffs cover very few shipments. Freight forwarders are also reluctant to share any figures.

There is a significant amount of research on the effect of the Jones Act on shipping rates. Some base costs on the differential cost of operation between US-flagged and international vessels. Others examine survey data or limited published prices. Published tariffs can be examined to determine cost differentials, and there are also public sources that report on generalized shipping costs.

None of these provide exact information, however, across sources used in this analysis. Shipping cost differentials between Jones Act qualified shippers and world shipping rates tend to cluster around 50 percent for containerized cargo and 60 percent for bulk, break-bulk and project cargos. Figure 2 below shows the differences graphically.

Figure 2
Shipping Cost Differentials



Throughout this analysis the models work based on cost differentials which are equal to the percentage change in shipping costs were the Jones Act to be eliminated. Mathematically the differential is different than the percentage difference between the future rate and the current rates. For example, based on a recent survey conducted by Advantage Business Consulting, it costs on average \$3,027 to ship containerized food products to Puerto Rico on a Jones Act carrier, and \$1,206 for a similar shipment internationally. The percentage DIFFERENCE in these costs is about 151 percent $((3027-1206)/1206) = 1821/1206 = 1.51$. The DIFFERENTIAL is equal to the percentage change in cost for shifting from a Jones Act carrier to a free market rate. This would be about 60 percent $((1206-3027)/3027) = -1821/3027 = .602$.

Even the carriers involved in the trade failed to provide any substantial data on rates in a study that they sponsored.⁵⁴ The only actual rate provided in that data is that a 53-foot container⁵⁵ shipped from the mainland to Puerto Rico would have a shipping cost of about \$2,500. This is roughly in line with the

⁵³ IMPLAN was originally developed by the US Forest Service, the Federal Emergency Management Agency and the Bureau of Land Management. It was converted to a user-friendly model by the IMPLAN in 1993. This model uses the Input-Output tables for 2016.

⁵⁴ *Impact of the U.S. Jones Act on Puerto Rico*, Reeve & Associates and Estudios Técnicos, Inc., prepared for The American Maritime Partnership, July 2018.

⁵⁵ In this example the physical size of the container is irrelevant as the cargo in question would “weigh out” before it would “cube out.” In other words, the weight of the container would reach the maximum gross weight limit for a truck in the Commonwealth which is 40 tons.

average FEU rate used in Example 1 below. The foreign flag shipping data suggest that the cost of shipping soup is about 1.96 percent of the value of the product, which is about in line with the statement made in the Reeve & Associates report; however, using the FAS price of the soup (and the same 80,000 cans) the cost for shipping via a foreign-flagged vessel would be just \$1,466, about 41 percent less than the rate in the report.⁵⁶

This analysis will examine six different scenarios, ranging from 28.9 percent to 79.1 percent in cost differentials in order to determine a reasonable range of effects.

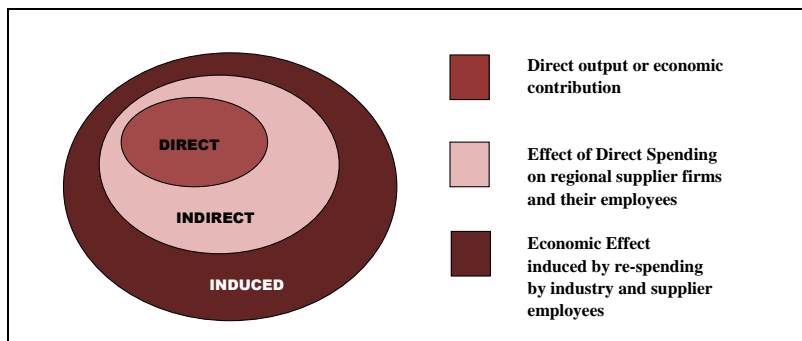
Effect of Higher Shipping Costs on the Puerto Rican Economy:

The higher costs brought on by the higher shipping rates resulting from the restrictions imposed by the Jones Act will lead to significant negative effects on the Puerto Rican economy. These effects can be estimated through the use of an input-output model.

It is sometimes mistakenly thought that initial spending accounts for all of the impact of an economic activity or a product; however, this initial spending on one economic activity always leads to a ripple effect that benefits other sectors and industries. This inter-industry effect can be assessed using multipliers from regional input-output modeling.

The economic activities are linked to other industries in the Puerto Rican economy. Regional (or indirect) impacts occur when these activities require purchases of goods and services. Additional induced impacts occur when workers involved in direct and indirect activities spend their wages in the region. The ratio between total economic and direct impacts is termed the multiplier. The framework in Figure 3 details this process.

Figure 3
Economic Impact Model



This method of analysis allows the impact of local production activities to be quantified in terms of final demand, earnings, and employment.

Once the direct impact of the industry has been calculated, the input-output methodology is used to calculate the contribution of the supplier sector and of the re-spending in the economy by employees in the industry and its suppliers. Once the initial direct cost figures have been established, they are entered into a model linked to the IMPLAN database. The IMPLAN data are used to generate estimates of direct wages and output in each sector of the economy. IMPLAN was originally developed by the US Forest Service, the Federal Emergency Management Agency and the Bureau of Land Management. It was converted to a user-friendly model by the Minnesota IMPLAN Group in 1993. The IMPLAN data and model closely follow the conventions used in the “Input-Output Study of the US Economy,” which was developed by the BEA.

⁵⁶ The FAS price is calculated by backing out the wholesale and retail margins from the \$1.58 reported in the Reeve & Associates report. Margins are from the US Department of Commerce, Bureau of Economic Analysis, *Margins After Redefinitions 2007 Detail*.

Data from the US Department of Labor's ES-202 reports are used to provide annual average wage and salary establishment counts, employment counts and payrolls at the county level. Since this data only covers payroll employees, it is modified to add information on independent workers, agricultural employees, construction employees, and certain government employees. Data are then adjusted to account for counties where non-disclosure rules apply. Wage data include not only cash wages, but health and life insurance payments, retirement payments and other non-cash compensation. They include all income paid to workers by employees.

Total output is the value of production by industry in a given jurisdiction. It is estimated by IMPLAN from sources similar to those used by the BEA in its RIMS II series. Where no Census or government surveys are available, IMPLAN uses models such as the Bureau of Labor Statistics Growth model to estimate the missing output.

The model includes information on income received by the Federal, State and Local Governments. The model produces estimates for the following taxes at the Federal Level: Corporate Income, Payroll, Personal Income, Estate, Gift, and Excise Taxes; Customs Duties; and Fines, Fees, etc. Commonwealth and Local tax revenues include estimates of: Corporate Profits, Property, Sales, Severance, Estate, Gift and Personal Income Taxes; Licenses; Fees; and certain Payroll Taxes.

The IMPLAN Make matrix represents the production of commodities by industry. The Bureau of Economic Analysis (BEA) Benchmark I/O Study of the US Make Table forms the bases of the IMPLAN model. The Benchmark Make Table is updated to current year prices, and rearranged into the IMPLAN sector format. The IMPLAN Use matrix is based on estimates of final demand, value-added by sector and total industry and commodity output data as provided by government statistics or estimated by IMPLAN. The BEA Benchmark Use Table is then bridged to the IMPLAN sectors. Once the re-sectoring is complete, the Use Tables can be updated based on the other data and model calculations of interstate and international trade.

In the IMPLAN model, as with any input-output framework, all expenditures are in terms of producer prices. This allocates all expenditures to the industries that produce goods and services. As a result, all data not received in producer prices is converted using margins which are derived from the BEA Input-Output model. Margins represent the difference between producer and consumer prices. As such, the margins for any good add to one. If, for example, 10 percent of the consumer price of a car is from the purchase of electricity, then the electricity margin would be 0.1.

Deflators, which account for relative price changes during different time periods, are derived from the Bureau of Labor Statistics (BLS) Growth Model. The 224 sector BLS model is mapped to the 536 sectors of the IMPLAN model. Where data are missing, deflators from BEA's Survey of Current Businesses are used.

Finally, one of the most important parts of the IMPLAN model, the Regional Purchase Coefficients (RPCs) must be derived. IMPLAN is derived from a national model, which represents the "average" condition for a particular industry. Since national production functions do not necessarily represent particular regional differences, adjustments need to be made. Regional trade flows are estimated based on the Multi-Regional Input-Output Accounts, a cross-sectional database with consistent cross interstate trade flows first developed in 1977. These data are updated and bridged to the 536 sector IMPLAN model.

The Puerto Rico IMPLAN model for 2016 is used to calculate the economic impact of the Jones Act on the economy of the Commonwealth for each of the six examples.⁵⁷ Figures are updated to reflect 2018 dollars. The results are presented below.

⁵⁷ The 2016 Tables were the latest available at the time of the analysis.

Example 1: Publicly Available Rates

General shipping rates are published by a number of on-line reference sources. One such source is World Freight Rates, an on-line shipping rate calculator established by Paradigm Freight Holdings, Inc. While the data in this calculator may not be completely up to date, percentage comparisons should be reasonable since the data would likely all reflect 2017 rates.⁵⁸ There are other on-line data sources; however, none had as many port-to-port rates as World Freight Rates.

Table 6
Port to San Juan Pairs Used in Example

Port	Containerized	Bulk	Distance (Nautical Miles)
Jacksonville, FL	x	x	1,462
Philadelphia, PA	x	x	1,741
Houston, TX	x	x	1,897
Rotterdam, Netherland	x	x	5,440
Guayaquil, Ecuador	x	x	2,256
Algeceres, Spain	x	x	4,117
Shanghai, China	x	x	14,463
Hong Kong, China	x	x	13,602
Busan, Korea	x	x	14,979
Kingston, Jamaica	x		711

Data were gathered for two shipments. The first, was for a 40-foot container of household goods (essentially a freight all kinds shipment) valued at \$10,000. No insurance was added to the shipping costs, so essentially this was a CFR rate. As a proxy for bulk shipments, rates for 1,000 metric tons of timber valued at \$100,000 were collected.

Rates were gathered for each shipment for the port-to-port pairs shown in Table 6. These were used as they included some of the largest international ports (namely, Shanghai, Busan, and Rotterdam), and a range of geographical regions.

Shipping cargo involves a number of processes, some which are in the steamship lines' control and some that are not. For example, the cost of loading cargo onto the ship would be based on the exporting port's tariff rates, while the cost of unloading cargo would be based on the rates in San Juan. These port charges, as well as charges for dockage, stacking and moving containers or other freight, storage, etc. would generally be included in the freight rate charged by the steamship line or carrier. It is important to note that since carriers do not report the actual rates charged for most shipments there are no actual data available that break actual charges for these Terminal Handling Charges (THC) based on shipment types, or even on ports. Even information reported on individual bills of lading (which are used to calculate the total value of cargo shipped for customs purposes) do not necessarily break out THCs from other shipping charges. In addition THCs may vary substantially depending on the time of year or type of shipment.

Other fixed costs that do not vary by distance are also included in the rates charged by carriers. These may include for example, heavy lift charges, delay charges, bunker surcharges (which are based on fuel costs), and demurrage charges. While the expenses can be incurred on either end of a shipping transaction (at the point of export or import) they are generally a fixed charge applied to a container or ton of cargo.

In order to model these charges, an analysis of the rates charged in both Jacksonville and Philadelphia was developed to solve for an average terminal charge.⁵⁹ The formula's below were used to solve for the Terminal Handling Charge:

⁵⁸ Paradigm Freight Holdings, Inc. ceased operation in September of 2017.

⁵⁹ Houston only handles a small fraction of the Puerto Rican trade so it was not used in this analysis

Jacksonville: \$2,543.32 = THC + CostPerMile *1462

Philadelphia: \$4,504.94 = THC + CostPerMile *1741

Solving these two equations together gives an average THC (or more appropriately, an average fixed cost) of \$795. So no matter what port the cargo is shipped from, there will be a \$795 charge plus whatever the line charges. This may differ from what lines report on their bill of lading for cargo, but does standardize rates across different distances from San Juan.⁶⁰ With this controlled for, the data from world freight rates, and the transit distance between each of the ports and San Juan is used to calculate the cost per nautical mile charged by the steamship line. These are presented in Table 7.

Using the rate from Jacksonville as a base case, the average percent differential for shipments from US ports, and from foreign ports is calculated. In this case the differential for US ports is -20.0 percent, and for foreign ports it is 68.9 percent. This means that the differential between Jones Act carriers and foreign-flag carriers for FAK shipments is 88.9 percent. This is after controlling for fixed costs.

A similar model is calculated for bulk freight shipments. In this case, the data do not work out as cleanly as there are significant differences in cost between the various US ports and San Juan. But using a similar methodology the differences work out to a 61.9 percent premium for using a US flagged vessel. This is not dissimilar to differentials calculated by a number of the prior studies of the cost of the Jones Act on bulk cargo.

Table 7
Differential Normalized Freight Rates for Containers by Port Pair

Port	Distance (Nautical Miles)	Rate Per NM		
		Freight Rate	Controlling for THC	
Jacksonville, FL	1,462	\$ 2,543	\$	1.1958
Philadelphia, PA	1,741	\$ 4,505	\$	2.1309
Houston, TX	1,897	\$ 2,197	\$	0.7393
Rotterdam, Netherlands	5,440	\$ 2,501	\$	0.3137
Guayaquil, Ecuador	2,256	\$ 3,037	\$	0.9937
Algeciras, Spain	4,117	\$ 3,001	\$	0.5359
Shanghai, China	14,463	\$ 2,377	\$	0.1094
Hong Kong, China	13,602	\$ 2,242	\$	0.1064
Busan, Korea	14,979	\$ 2,354	\$	0.1041
Kingston, Jamaica	711	\$ 1,109	\$	0.4419

Applying these differentials to all of the waterborne freight imported from Puerto Rico in 2017 gives an estimated increase in shipping costs of \$570.9 million. This figure represents only the additional ocean freight charges. These freight charges are then passed through to truckers, wholesalers, manufacturers and service providers in Puerto Rico increasing their cost of doing business. Using wholesale markups from the US Department of Commerce,⁶¹ the additional cost for warehousing and inland transportation in Puerto Rico would be \$27.8 million and for wholesalers it would be \$112.3 million.

Wholesalers ship either to manufacturers and service providers or to retailers. Imported consumer products like canned foods, apparel, toys and automobiles are assumed to go from wholesaling to retail, while other industrial goods such as steel, cement, or crude oil, are assumed to go through a manufacturing process before going on to wholesale and retail.

Using the IMPLAN make tables, and the wholesale and retail margins from the BEA, the overall additional retailing cost to residents or businesses in Puerto Rico is another \$387.3 million, for a total increase in costs of nearly \$1.1 billion.

⁶⁰ Recent data from a survey and from the Surface Transportation Board suggests that port charges are around \$220 - \$250 per FEU. But it may not reflect all charges incurred by a shipper depending on the time of year, the steamship line or the specific ports involved.

⁶¹ Markups from: *Margins After Redefinitions: 2007 Detail*, Industry Economic Accounts Directorate, Bureau of Economic Analysis (BEA), U.S. Department of Commerce.

Appendix Table Two presents the shipping rate differentials developed through this analysis.

Table 8
Excess Costs to Puerto Rico Resulting From the Jones Act – Public Data

Cargo Type	Estimated Additional					Pct Change
	Water Transportation	Land Transportation	Wholesale	Retail	Total	
Container	\$ 530,298,444	\$ 25,676,908	\$ 101,641,014	\$ 370,990,615	\$ 1,028,606,981	4.4%
Bulk	\$ 40,635,915	\$ 2,085,436	\$ 10,666,201	\$ 16,338,659	\$ 69,726,211	0.4%
Total	\$ 570,934,359	\$ 27,762,344	\$ 112,307,215	\$ 387,329,274	\$ 1,098,333,192	2.7%

Based on the increased costs of \$1.1 billion, the IMPLAN model for Puerto Rico was run in order to calculate the total economic impact of the Jones Act on the Commonwealth based on the cost differentials between Jones Act carriers and foreign-flagged ships. The manufacturing process for each of these imported goods is derived from the IMPLAN make tables for Puerto Rico.⁶² Running the imports through the models at either the inland or wholesaling level leads to additional business costs as products like oil or steel work their way through manufacturing processes on the island. All told, the additional costs to the Puerto Rican economy would approach \$1.2 billion, or just over \$375 per resident.

Table 9
Direct Cost Impact by Sector – Publicly Available Rates Example

Sector	Shipping	Inland	Wholesale	Retail	Total
Agriculture	\$ 31,297,942	\$ 1,110,022	\$ 5,307,987	\$ 10,126,768	\$ 47,842,720
Business and Personal Services	\$ 75,921,134	\$ 2,641,226	\$ 10,563,878	\$ 40,176,058	\$ 129,302,296
Construction	\$ 20,766,506	\$ 902,965	\$ 5,784,829	\$ 12,341,644	\$ 39,795,944
Finance, Insurance and Real Estate	\$ 1,258,806	\$ 46,841	\$ 198,404	\$ 762,862	\$ 2,266,912
Government	\$ -	\$ -	\$ -	\$ -	\$ -
Manufacturing	\$ 503,554,054	\$ 21,222,684	\$ 72,634,827	\$ 226,524,468	\$ 823,936,033
Mining	\$ 1,985,037	\$ 5,029	\$ 419,402	\$ 343,467	\$ 2,752,935
Retailing	\$ 4,088,134	\$ 89,212	\$ 527,365	\$ 1,306,702	\$ 6,011,413
Transportation and Communication	\$ 22,246,819	\$ 312,578	\$ 2,030,069	\$ 7,463,908	\$ 32,053,375
Travel and Entertainment	\$ 80,752,739	\$ 2,732,628	\$ 8,704,593	\$ 22,434,034	\$ 114,623,994
Wholesaling	\$ 161,404	\$ 5,546	\$ 29,039	\$ 122,475	\$ 318,464
Other	\$ 289,248	\$ 7,592	\$ 46,669	\$ 120,846	\$ 464,355
Total	\$ 742,321,823	\$ 29,076,323	\$ 106,247,061	\$ 321,723,233	\$ 1,199,368,441

Nearly 69 percent of these costs will fall on the Commonwealth's manufacturing industry or on consumer and business purchases of manufactured goods.

Table 10
Economic Losses Resulting From the Jones Act – Publicly Available Rates Example

	Direct	Supplier	Induced	Total
Jobs	10,120	1,680	1,470	13,270
Wages	\$ 239,643,170	\$ 54,921,750	\$ 43,708,820	\$ 338,273,740
Economic Output	\$ 1,086,010,860	\$ 206,357,710	\$ 175,112,130	\$ 1,467,480,700

	Federal	State and Local	Total
Taxes	\$ 52,916,175	\$ 53,855,321	\$ 106,771,496

Based on these increased costs estimated across each of the 367 industry sectors operating in Puerto Rico, the overall economic impact of the Jones Act under these assumptions is nearly \$1.5 billion.⁶³ About 13,270 fewer jobs have been created in the Commonwealth's economy as a result of these higher costs, and local tax revenues are as much as \$106.8 million lower

⁶² 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.

⁶³ Throughout this report there has been an effort to round numbers to the nearest first decimal place.

The largest impacts fall on the manufacturing industry in the Commonwealth, with \$793.4 million in reduced output and about 2,800 fewer jobs than there would be were the Jones Act provisions to be eliminated. Agriculture, business and personal services, and the tourism industry have also been significantly impacted.

Table 11
Total Economic Losses By Sector Resulting From the Jones Act – Publicly Available Rates Example

Sector	Jobs	Wages	Output
Agriculture	3,240	\$ 31,145,100	\$ 66,683,570
Business and Personal Services	3,339	\$ 108,674,200	\$ 216,959,810
Construction	447	\$ 15,742,900	\$ 42,584,000
Finance, Insurance and Real Estate	160	\$ 7,861,500	\$ 72,948,970
Government	15	\$ 1,204,000	\$ 1,420,180
Manufacturing	2,776	\$ 77,620,100	\$ 793,365,650
Mining	14	\$ 380,200	\$ 1,536,090
Retailing	436	\$ 11,383,300	\$ 30,916,520
Transportation and Communication	332	\$ 16,390,300	\$ 65,399,260
Travel and Entertainment	2,270	\$ 55,937,200	\$ 137,841,860
Wholesaling	226	\$ 11,450,200	\$ 37,121,340
Other	20	\$ 484,700	\$ 703,450
Total	13,275	\$ 338,273,700	\$ 1,467,480,700

Example 2: Published Tariffs

Common carriers serving the US market are required to file tariffs with the Surface Transportation Board, an independent agency of the Federal government. These data are complex and often incomplete, and generally do not reflect the actual rates charged by carriers which are generally set by individual contracts with shippers and freight forwarders. Nevertheless, an examination of carrier tariff filings can be used to derive the differential between shipping charges between international carriers and US-flag operators.

JDA used 2015 tariff rates and averaged them across IMPLAN categories. Forty-foot container rates were used for consistency, and tonnage data was converted to FEUs based on TEU per ton data for each product type from PIERS. Where no tariff rate was available, the average rate per FEU was used. Freight rates included the shipping rate, bunker fuel surcharges and accessorial terminal charges included in every shipment. Bulk rates were calculated based on a tons per TEU conversion, also from PIERS.

Table 12
Excess Costs to Puerto Rico Resulting From the Jones Act – Published Tariffs

Cargo Type	Estimated Additional				
	Water		Land		Total
	Transportation	Transportation	Wholesale	Retail	
Container	\$ 402,692,495	\$ 19,498,262	\$ 77,183,091	\$ 281,718,979	\$ 781,092,827
Bulk	\$ 44,347,883	\$ 2,275,934	\$ 11,640,527	\$ 17,831,146	\$ 76,095,491
Total	\$ 447,040,378	\$ 21,774,196	\$ 88,823,618	\$ 299,550,126	\$ 857,188,318

Based on this model, posted tariff rates had a 58.5 percent differential for Jones Act carriers. More limited information on recent tariff filings is available from the Surface Transportation Board. Using data on FAK rates from Crowley, the average all-in rate per FEU is \$3,318.⁶⁴ This compares to an international FAK rate of about \$1,880 per FEU from the model. This would be a 76.48 percent differential. Averaging the two differentials together suggests that the differential between international and domestic rates to Puerto Rico is roughly 67.5 percent. These higher prices pass through the system and result in overall costs to Puerto Rican businesses and consumers of just under \$857.2 million. This differential is not outside of the general range of findings by dozens of analysts who have examined this issue.

⁶⁴ Data emailed from the Surface Transportation Board, Office of Public Assistance, Governmental Affairs and Compliance, Rail Customer and Public Assistance Program on February, 2019.

Table 13
Direct Cost Impact by Sector – Published Tariffs Example

Sector	Shipping	Inland	Wholesale	Retail	Total
Agriculture	\$ 24,565,506	\$ 843,303	\$ 4,398,433	\$ 7,975,846	\$ 37,783,089
Business and Personal Services	\$ 58,172,981	\$ 2,012,853	\$ 8,191,674	\$ 30,784,766	\$ 99,162,274
Construction	\$ 17,117,732	\$ 686,426	\$ 4,742,675	\$ 9,705,279	\$ 32,252,112
Finance, Insurance and Real Estate	\$ 1,027,517	\$ 35,570	\$ 163,709	\$ 591,693	\$ 1,818,489
Government	\$ -	\$ -	\$ -	\$ -	\$ -
Manufacturing	\$ 394,616,267	\$ 16,213,240	\$ 57,355,859	\$ 174,714,666	\$ 642,900,032
Mining	\$ 2,183,693	\$ 3,819	\$ 455,546	\$ 321,733	\$ 2,964,792
Retailing	\$ 3,996,009	\$ 67,854	\$ 499,556	\$ 1,082,447	\$ 5,645,866
Transportation and Communication	\$ 19,429,351	\$ 238,562	\$ 1,884,719	\$ 5,992,677	\$ 27,545,310
Travel and Entertainment	\$ 61,524,681	\$ 2,077,625	\$ 6,724,162	\$ 17,167,540	\$ 87,494,008
Wholesaling	\$ 129,779	\$ 4,227	\$ 23,867	\$ 94,979	\$ 252,853
Other	\$ 228,859	\$ 5,774	\$ 38,228	\$ 94,245	\$ 367,106
Total	\$ 582,992,376	\$ 22,189,252	\$ 84,478,428	\$ 248,525,873	\$ 938,185,929

Based on the costs calculated from the published tariff rates, the IMPLAN model for Puerto Rico was run in order to calculate the total economic impact of the Jones Act on the Commonwealth based on the cost differentials between Jones Act carriers and foreign-flagged ships. The total cost by economic sector is just under \$938.2 million and is shown in Table 13 below. This is equal to about \$294 per resident of the Commonwealth.

Table 14
Economic Losses Resulting From the Jones Act – Published Tariffs Example

	Direct	Supplier	Induced	Total
Jobs	7,850	1,300	1,150	10,300
Wages	\$ 187,056,700	\$ 42,646,700	\$ 34,097,410	\$ 263,800,810
Economic Output	\$ 849,248,160	\$ 160,431,000	\$ 136,605,610	\$ 1,146,284,760

	Federal	State and Local	Total
Taxes	\$ 41,324,500	\$ 42,126,160	\$ 83,450,660

Using tariff rates JDA calculated both positive and negative differentials between domestic and foreign carrier shipping charges. Any savings flow through the system in the same manner as costs, and overall the impact ends up being slightly lower than the initial costs would suggest.⁶⁵ Nearly 78 percent of these costs will fall on the Commonwealth's manufacturing industry or on consumer and business purchases of manufactured goods.

Table 15
Total Economic Losses By Sector Resulting From the Jones Act – Published Tariffs Example

Sector	Jobs	Wages	Output
Agriculture	2,530	\$ 24,349,100	\$ 52,206,600
Business and Personal Services	2,570	\$ 83,869,200	\$ 167,691,000
Construction	360	\$ 12,744,400	\$ 34,464,700
Finance, Insurance and Real Estate	130	\$ 6,139,100	\$ 56,910,500
Government	10	\$ 936,300	\$ 1,104,400
Manufacturing	2,130	\$ 60,460,200	\$ 620,061,200
Mining	20	\$ 408,900	\$ 1,652,300
Retailing	350	\$ 9,103,600	\$ 24,593,300
Transportation and Communication	270	\$ 13,673,500	\$ 52,657,800
Travel and Entertainment	1,740	\$ 42,839,400	\$ 105,549,200
Wholesaling	180	\$ 8,895,800	\$ 28,840,200
Other	20	\$ 381,200	\$ 553,700
Total	10,310	\$ 263,800,700	\$ 1,146,284,900

Based on these increased costs estimated across each of the 367 industry sectors operating in Puerto Rico, the overall economic impact of the Jones Act under Example 2 is more than \$1.1 billion. About 10,300

⁶⁵ Note that there are a couple of instances where a very small amount of shipments leads to huge savings differentials. This is because the percentage savings becomes large since the denominator of the calculation is so small. To keep the model from "blowing up", these were adjusted to zero in two cases, fruit juices and copper sheet, both of which are very small imports relative to the total.

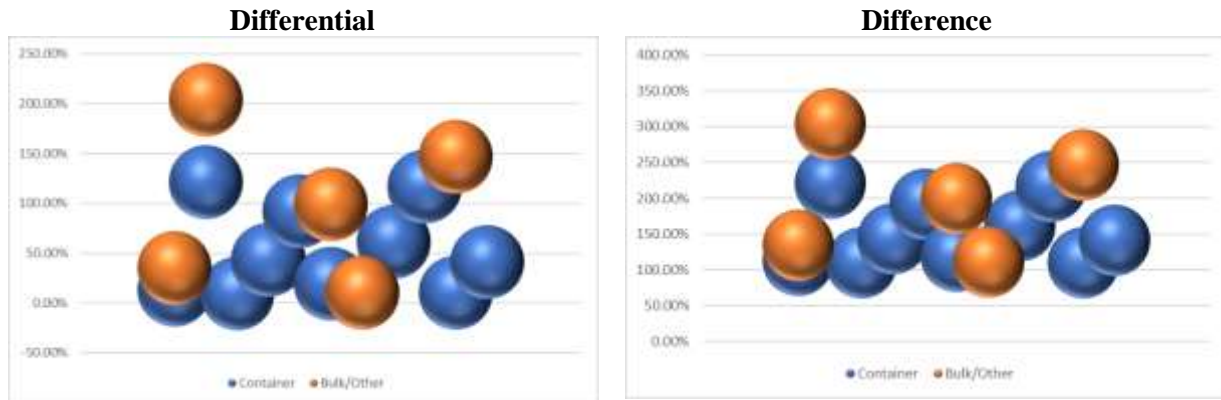
fewer jobs have been created in the Commonwealth’s economy as a result of these higher costs, and tax revenues are as much as \$83.4 million lower.

The largest impacts fall on the manufacturing industry in the Commonwealth, with \$620.1 million in reduced output and about 2,130 fewer jobs than there would be were the Jones Act provisions to be eliminated. The tourism industry would experience roughly 1,740 lost jobs. Other industries with major impacts predicted include services, real estate and agriculture.

Example 3: Average of Past Studies

There have been dozens of studies prepared by government agencies, academics, and interested parties examining the cost of shipping products under the Jones Act. Nearly all of these studies suggest, as economic theory would assert, that the costs for shipping under the cabotage system would be higher than prevailing rates. Even a study conducted for the Jones Act carriers suggest that shipping costs are higher, though it alludes that – at least for containerized freight – overall shipping costs to Puerto Rico are consistent with free trade carriers.

Figure 4
Distribution of Differential Costs to Puerto Rico Resulting From the Jones Act From Past Studies Compared to Percent Difference in Cost



There is a sizable amount of cross-referencing between the studies, but there are a few independent assertions about the cost differentials for bulk cargo and containerized cargo.⁶⁶ (For a list of all of the studies used in this analysis see Appendix Table Three.)

Table 16
Excess Costs to Puerto Rico Resulting From the Jones Act – Past Study Averages

Cargo Type	Estimated Additional				
	Water		Land		
	Transportation	Transportation	Wholesale	Retail	Total
Container	\$ 172,248,308	\$ 8,340,217	\$ 33,014,414	\$ 120,502,910	\$ 334,105,849
Bulk	\$ 51,943,575	\$ 2,665,745	\$ 13,634,260	\$ 20,885,179	\$ 89,128,760
Total	\$ 224,191,883	\$ 11,005,962	\$ 46,648,675	\$ 141,388,089	\$ 423,234,609

Taking the averages of the cost differentials across these studies an estimated shipping differential of 28.8 percent for containerized cargo, and 79.1 percent for bulk cargo are estimated (See Appendix 3).⁶⁷ This

⁶⁶ There are about 40 different studies that were examined which looked at the costs of the Jones Act on either the US economy or the economy of Puerto Rico. Some of these studies did not provide any data to support their conclusions. Many others referenced earlier reports as the source for their estimates, while still others simply presented a total cost difference rather than a way to calculate a percentage change. In all, the results from 12 studies were used, including two that were commissioned by the Jones Act carriers.

⁶⁷ Container: ((1.133+1.211624752-0.0984849+1.43+1.919774365+1.1894+1.104+1.61+2.166666667+1.1+1.41)/11)-1
 Bulk Freight ((1.347985348+2.0404684+1.9906+1.104+2.47)/5)-1

means that if a container costs \$2,000 to ship using a Jones Act authorized carrier, it would cost \$1,424 to ship on an international ship. Likewise, a bulk shipment costing \$10,000 to ship using one of the limited Jones Act authorized tankers or bulk carriers would cost just \$2,090 to ship using a market rate vessel.

Based on the costs calculated based on prior studies, the IMPLAN model for Puerto Rico was run in order to calculate the total economic impact of the Jones Act on the Commonwealth. The total cost by economic sector is shown in Table 17 below.

Table 17
Direct Cost Impact by Sector – Past Study Average Example

Sector	Shipping	Inland	Wholesale	Retail	Total
Agriculture	\$ 14,050,025	\$ 362,225	\$ 2,933,144	\$ 4,110,394	\$ 21,455,789
Business and Personal Services	\$ 26,676,651	\$ 886,373	\$ 3,918,929	\$ 13,843,260	\$ 45,325,213
Construction	\$ 11,546,004	\$ 296,857	\$ 3,009,164	\$ 4,966,306	\$ 19,818,330
Finance, Insurance and Real Estate	\$ 667,841	\$ 15,215	\$ 101,916	\$ 283,400	\$ 1,068,372
Government	\$ -	\$ -	\$ -	\$ -	\$ -
Manufacturing	\$ 203,256,112	\$ 7,230,316	\$ 29,969,768	\$ 81,329,603	\$ 321,785,799
Mining	\$ 2,605,217	\$ 1,635	\$ 530,848	\$ 286,513	\$ 3,424,213
Retailing	\$ 3,941,576	\$ 29,301	\$ 455,890	\$ 683,428	\$ 5,110,194
Transportation and Communication	\$ 15,203,943	\$ 107,038	\$ 1,644,925	\$ 3,357,259	\$ 20,313,164
Travel and Entertainment	\$ 26,939,419	\$ 896,789	\$ 3,155,243	\$ 7,665,470	\$ 38,656,920
Wholesaling	\$ 79,254	\$ 1,848	\$ 14,648	\$ 45,454	\$ 141,204
Other	\$ 130,583	\$ 2,490	\$ 23,168	\$ 46,371	\$ 202,612
Total	\$ 305,096,624	\$ 9,830,086	\$ 45,757,642	\$ 116,617,458	\$ 477,301,809

All told, under these assumptions the overall additional costs to Puerto Rican firms and consumers would be \$477.3 million, or roughly \$150 per resident. About 67 percent of these costs will fall on the Commonwealth's manufacturing industry or on consumer and business purchases of manufactured goods.

Table 18
Economic Losses Resulting From the Jones Act – Past Study Example

	Direct	Supplier	Induced	Total
Jobs	3,900	630	580	5,100
Wages	\$ 94,380,990	\$ 20,901,330	\$ 17,146,790	\$ 132,429,110
Economic Output	\$ 431,825,090	\$ 79,174,660	\$ 68,695,760	\$ 579,695,510

	Federal	State and Local	Total
Taxes	\$ 20,884,880	\$ 21,402,560	\$ 42,287,440

Based on these increased costs estimated across each of the 367 industry sectors operating in Puerto Rico, the overall economic impact of the Jones Act under Example 3 is \$579.7 million. About 5,100 fewer jobs have been created in the Commonwealth's economy as a result of these higher costs, and tax revenues are as much as \$42.3 million lower

Table 19
Total Economic Losses By Sector Resulting From the Jones Act – Past Studies Example

Sector	Jobs	Wages	Output
Agriculture	1,370	\$ 12,809,800	\$ 27,986,500
Business and Personal Services	1,210	\$ 39,747,200	\$ 80,151,400
Construction	220	\$ 7,791,300	\$ 21,045,400
Finance, Insurance and Real Estate	60	\$ 3,111,000	\$ 28,668,600
Government	10	\$ 462,700	\$ 545,800
Manufacturing	980	\$ 29,856,500	\$ 313,073,900
Mining	20	\$ 471,200	\$ 1,904,000
Retailing	190	\$ 5,114,100	\$ 13,516,100
Transportation and Communication	160	\$ 9,164,100	\$ 30,754,900
Travel and Entertainment	790	\$ 19,324,400	\$ 47,572,600
Wholesaling	90	\$ 4,373,800	\$ 14,179,700
Other	10	\$ 203,000	\$ 296,700
Total	5,110	\$ 132,429,100	\$ 579,695,600

The largest impacts fall on the manufacturing industry in the Commonwealth, with \$313.1 million in reduced output and about 980 fewer jobs than there would be were the Jones Act provisions to be eliminated. About 54 percent of these costs will fall on the Commonwealth's manufacturing industry or on consumer and business purchases of manufactured goods.

Example 4: Difference Derived from Reeve & Associates Report

The steamship lines involved in the Jones Act trade, which are also members of the American Maritime Partnership (AMP), are scrupulous about never publishing useful rate information. Across the multiple reports that have been released by the carriers, only indexes and generalities are used to document how their rates may not differ from those of foreign-flag carriers. However, in the most recent study released by the AMP, a crack in the armor appeared.⁶⁸ In this study, it was revealed that a container of soup would cost \$2,500 to ship. While this is a rate for a 53-foot container, the actual size is irrelevant because the container would *weigh out* well before it was full. In fact the study suggests that this container would contain 80,000 cans of soup which is roughly 40 short tons of cargo, the maximum weight allowed on most roadways across the US.

Table 20
Excess Costs to Puerto Rico Resulting From the Jones Act – Reeves & Associates Example

Cargo Type	Estimated Additional					Total
	Water Transportation	Land Transportation	Wholesale	Retail		
Container	\$ 244,598,404	\$ 11,843,389	\$ 46,881,581	\$ 171,118,195		\$ 474,441,569
Bulk	\$ 26,937,233	\$ 1,382,419	\$ 7,070,542	\$ 10,830,770		\$ 46,220,965
Total	\$ 271,535,637	\$ 13,225,808	\$ 53,952,124	\$ 181,948,965		\$ 520,662,534

This \$2,500 per container price can be compared with the price of shipping canned foods by foreign-flagged carriers which was derived for the study. The foreign flag shipping data suggest that the cost of shipping soup is about 1.96 percent of the value of the product, which is about in line with the statement made in the Reeve & Associates report; however, using the FAS price of the soup (and the same 80,000 cans) the cost for shipping via a foreign-flagged vessel would be just \$1,466, about 41 percent less than the rate in the report.⁶⁹ This rate differential is applied across all cargo to come up with the cost estimates in this example.

Table 21
Direct Cost Impact by Sector – Reeves & Associates Example

Sector	Shipping	Inland	Wholesale	Retail	Total
Agriculture	\$ 14,921,270	\$ 512,229	\$ 2,671,641	\$ 4,844,588	\$ 22,949,728
Business and Personal Services	\$ 35,334,700	\$ 1,222,622	\$ 4,975,684	\$ 18,698,895	\$ 60,231,900
Construction	\$ 10,397,437	\$ 416,940	\$ 2,880,736	\$ 5,895,058	\$ 19,590,172
Finance, Insurance and Real Estate	\$ 624,121	\$ 21,605	\$ 99,438	\$ 359,399	\$ 1,104,564
Government	\$ -	\$ -	\$ -	\$ -	\$ -
Manufacturing	\$ 239,692,844	\$ 9,848,042	\$ 34,838,373	\$ 106,122,983	\$ 390,502,242
Mining	\$ 1,326,391	\$ 2,320	\$ 276,702	\$ 195,423	\$ 1,800,836
Retailing	\$ 2,427,205	\$ 41,215	\$ 303,434	\$ 657,486	\$ 3,429,341
Transportation and Communication	\$ 11,801,532	\$ 144,905	\$ 1,144,792	\$ 3,639,997	\$ 16,731,225
Travel and Entertainment	\$ 37,370,547	\$ 1,261,965	\$ 4,084,306	\$ 10,427,691	\$ 53,144,508
Wholesaling	\$ 78,829	\$ 2,568	\$ 14,497	\$ 57,691	\$ 153,585
Other	\$ 139,011	\$ 3,507	\$ 23,220	\$ 57,245	\$ 222,983
Total	\$ 354,113,888	\$ 13,477,916	\$ 51,312,823	\$ 150,956,456	\$ 569,861,083

Based on these additional costs, the IMPLAN model for Puerto Rico was run in order to calculate the total economic impact of the Jones Act on the Commonwealth based on the cost differentials between Jones Act carriers and foreign-flagged ships, that JDA calculated based on these assumptions. The total

⁶⁸ *Impact of the U.S. Jones Act on Puerto Rico*, Reeve & Associates and Estudios Tecnicos, Inc., prepared for the American Maritime Partnership, July 2018.

⁶⁹ The FAS price is calculated by backing out the wholesale and retail margins from the \$1.58 reported in the Reeve & Associates report. Margins are from the US Department of Commerce, Bureau of Economic Analysis, *Margins After Redefinitions 2007 Detail*.

cost by economic sector is shown in Table 21. The \$596.9 million added cost to the Puerto Rican economy would equate to about \$178 per resident.

Based on these increased costs estimated across each of the 367 industry sectors operating in Puerto Rico, the overall economic impact of the Jones Act based on the Reeves & Associates study is \$696.3 million. About 6,250 fewer jobs have been created in the Commonwealth's economy as a result of these higher costs, and tax revenues are as much as \$85.6 million lower.

Table 22
Economic Losses Resulting From the Jones Act – Reeves & Associates Example

	Direct	Supplier	Induced	Total
Jobs	4,770	790	700	6,250
Wages	\$ 113,619,630	\$ 25,903,920	\$ 20,711,020	\$ 160,234,570
Economic Output	\$ 515,839,620	\$ 97,446,980	\$ 82,975,260	\$ 696,261,860

	Federal	State and Local	Total
Taxes	\$ 42,395,630	\$ 43,193,340	\$ 85,588,970

As with the shipping cost data, the largest impacts fall on the manufacturing industry in the Commonwealth, with \$376.6 million in reduced output and about 1,300 fewer jobs than there would be were the Jones Act provisions to be eliminated. Agriculture, services, and the tourism industry have also been significantly impacted.

Table 23
Total Economic Losses By Sector Resulting From the Jones Act – Reeves & Associates Example

Sector	Jobs	Wages	Output
Agriculture	1,540	\$ 14,789,800	\$ 31,710,700
Business and Personal Services	1,560	\$ 50,942,800	\$ 101,856,700
Construction	220	\$ 7,741,000	\$ 20,934,100
Finance, Insurance and Real Estate	80	\$ 3,728,900	\$ 34,567,800
Government	10	\$ 568,700	\$ 670,800
Manufacturing	1,290	\$ 36,724,000	\$ 376,629,800
Mining	10	\$ 248,400	\$ 1,003,600
Retailing	210	\$ 5,529,600	\$ 14,938,100
Transportation and Communication	160	\$ 8,305,400	\$ 31,984,700
Travel and Entertainment	1,060	\$ 26,021,000	\$ 64,111,300
Wholesaling	110	\$ 5,403,400	\$ 17,517,800
Other	10	\$ 231,500	\$ 336,300
Total	6,260	\$ 160,234,500	\$ 696,261,700

Example 5: Recent Importer Survey Results

In November 2018, San Juan based Advantage Business Consulting, carried out a survey of maritime transportation practices among food, beverage and general merchandise companies in Puerto Rico. The survey included information on 32 companies with nearly 40,000 containers transported over nine months (January 2018 to September 2018).⁷⁰

In order to compare freight rates across different originating ports the data were normalized to 1,000 nautical miles. The data were also adjusted by container size and converted to dollars per FEU. These standardized figures from the survey were benchmarked against shipping charges for similar cargo coming from non-US ports located a similar distance from San Juan. For example, surveyed freight rates from Jacksonville were compared to similar container rates from either Panamá or Cartagena.

Based on the survey, shipping the average FEU from the United States to Puerto Rico cost \$3,072 on a normalized basis, compared to \$1,206 for the same container shipped from a foreign port. The percentage

⁷⁰ *Analysis of Issues Related to Maritime Transportation to Puerto Rico*, prepared by Advantage Business Consulting, February 2019.

DIFFERENCE in these costs is about 151 percent $((3027-1206)/1206) = 1821/1206 = 1.51$. The DIFFERENTIAL is equal to the percentage change in cost for shifting from a Jones Act carrier to a free market rate. This would be about 60 percent $((1206-3027)/3027) = -1821/3027 = .602$. This means that the price differential is 60 percent for imports from US ports due to the Jones Act.⁷¹ The figure is the blended rate for dry goods and refrigerated goods.⁷² While the survey only covered containerized products, for the purpose of this study, the same 60.7 percent differential is being applied to bulk and other non-containerized cargo.

Table 24
Excess Costs to Puerto Rico Resulting From the Jones Act – Survey Data Example

Cargo Type	Estimated Additional				Total
	Water Transportation	Land Transportation	Wholesale	Retail	
Container	\$ 357,948,884	\$ 17,331,789	\$ 68,607,192	\$ 250,416,870	\$ 694,304,736
Bulk	\$ 39,420,341	\$ 2,023,052	\$ 10,347,135	\$ 15,849,908	\$ 67,640,436
Total	\$ 397,369,225	\$ 19,354,841	\$ 78,954,327	\$ 266,266,778	\$ 761,945,172

Using the costs calculated from the recent survey, the IMPLAN model for Puerto Rico was run in order to calculate the total economic impact of the Jones Act on the Commonwealth based on the cost differentials between Jones Act carriers and foreign-flagged ships. The total cost by economic sector is shown in Table 25 below. As the table shows, after working their way through the economy, these higher shipping costs lead to \$833.9 million in higher prices, or about \$261 per resident.

Table 25
Direct Cost Impact by Sector – Recent Survey Example

Sector	Shipping	Inland	Wholesale	Retail	Total
Agriculture	\$ 21,836,005	\$ 749,603	\$ 3,909,719	\$ 7,089,641	\$ 33,584,968
Business and Personal S	\$ 51,709,316	\$ 1,789,202	\$ 7,281,488	\$ 27,364,236	\$ 88,144,243
Construction	\$ 15,215,761	\$ 610,156	\$ 4,215,712	\$ 8,626,915	\$ 28,668,544
Finance, Insurance and	\$ 913,348	\$ 31,617	\$ 145,519	\$ 525,950	\$ 1,616,434
Government	\$ -	\$ -	\$ -	\$ -	\$ -
Manufacturing	\$ 350,770,016	\$ 14,411,769	\$ 50,982,985	\$ 155,301,926	\$ 571,466,695
Mining	\$ 1,941,060	\$ 3,395	\$ 404,930	\$ 285,985	\$ 2,635,370
Retailing	\$ 3,552,008	\$ 60,315	\$ 444,050	\$ 962,175	\$ 5,018,547
Transportation and Con	\$ 17,270,534	\$ 212,056	\$ 1,675,306	\$ 5,326,824	\$ 24,484,720
Travel and Entertainme	\$ 54,688,606	\$ 1,846,778	\$ 5,977,033	\$ 15,260,035	\$ 77,772,451
Wholesaling	\$ 115,359	\$ 3,758	\$ 21,215	\$ 84,426	\$ 224,758
Other	\$ 203,431	\$ 5,132	\$ 33,980	\$ 83,774	\$ 326,316
Total	\$ 518,215,445	\$ 19,723,780	\$ 75,091,936	\$ 220,911,887	\$ 833,943,048

Over 69 percent of these costs will fall on the Commonwealth's manufacturing industry or on consumer and business purchases of manufactured goods. Almost \$77.8 million would fall on the tourist sector.

Table 26
Economic Losses Resulting From the Jones Act – Recent Survey Example

	Direct	Supplier	Induced	Total
Jobs	6,970	1,160	1,020	9,150
Wages	\$ 166,272,620	\$ 37,908,180	\$ 30,308,810	\$ 234,489,610
Economic Output	\$ 754,887,250	\$ 142,605,330	\$ 121,427,200	\$ 1,018,919,790

	Federal	State and Local	Total
Taxes	\$ 36,732,884	\$ 37,445,475	\$ 74,178,359

⁷¹ $(1206-3072)/3072 = -1866/3072 = 60.7$ percent

⁷² Ibid.

Based on these increased costs estimated across each of the 367 industry sectors operating in Puerto Rico, the overall economic impact of the Jones Act under Example 5 is \$1.0 billion. About 9,150 fewer jobs have been created in the Commonwealth's economy as a result of these higher costs, and tax revenues are as much as \$74.2 million lower.

The largest impacts fall on the manufacturing industry in the Commonwealth, with \$551.1 million in reduced output and about 1,890 fewer jobs than there would be were the Jones Act provisions to be eliminated. Agriculture, services, and the tourism industry have also been significantly impacted.

Table 27
Total Economic Losses By Sector Resulting From the Jones Act – Recent Survey Example

Sector	Jobs	Wages	Output
Agriculture	2,250	\$ 21,643,600	\$ 46,405,900
Business and Personal Services	2,290	\$ 74,550,400	\$ 149,058,700
Construction	320	\$ 11,328,300	\$ 30,635,300
Finance, Insurance and Real Estate	110	\$ 5,457,000	\$ 50,587,100
Government	10	\$ 832,300	\$ 981,700
Manufacturing	1,890	\$ 53,742,400	\$ 551,165,500
Mining	10	\$ 363,500	\$ 1,468,700
Retailing	310	\$ 8,092,100	\$ 21,860,700
Transportation and Communication	240	\$ 12,154,300	\$ 46,806,900
Travel and Entertainment	1,550	\$ 38,079,500	\$ 93,821,500
Wholesaling	160	\$ 7,907,400	\$ 25,635,700
Other	10	\$ 338,800	\$ 492,200
Total	9,150	\$ 234,489,600	\$ 1,018,919,900

Example 6: JDA Suggested Difference

Obviously, researchers have had a difficult time calculating the costs and the effects of the cabotage laws on the Commonwealth of Puerto Rico, or on the United States for that matter. While shipping volume and value data are readily available, data on freight rates are for the most part, kept confidential by carriers. Even the tariffs that are required to be filed with the Federal government are considered to be only broadly representative of actual rates. Studies commissioned by Jones Act carriers and other supporters of the restrictions strive to ensure that no usable data on shipping rates are made available.⁷³

Table 28
Freight Cost Differential to Puerto Rico Resulting From the Jones Act by Example

	Bulk	Containerized
Example 1	61.9%	88.9%
Example 2	67.5%	67.5%
Example 3	79.1%	28.9%
Example 4	41.0%	41.0%
Example 5	60.0%	60.0%
Average	61.9%	57.3%

As such, rather than using data on shipping rates, most studies have relied on proxies. These proxies have included survey data, ship capital and operating cost data, or generalized freight rates. Some proxies are likely better than others. For example, if US Flag carriers are charging monopoly rates, they would not be based on costs, but rather on what economic rents could be achieved. Survey data can be variable depending on the design and sample size. Generalized freight rates from freight forwarders, or freight forwarder's databases, may be better since one could reason that differences between domestic and foreign flag rates would have similar biases or inconsistencies.

⁷³ See for example: *Economic Impact of the Jones Act on the Commonwealth of Puerto Rico: Setting the Record Straight*, Reeve & Associates, April 2003. Reports that are based on hidden or "confidential" data are generally discounted by academics and researchers since it is impossible to ensure that the results are accurate.

This analysis has used a number of different assumptions to provide a range of potential costs to the Puerto Rican economy and consumers. While none of these models would be exact, they all suggest that the costs are significant. Looking across the models, the differentials between US- and foreign-flagged carriers range from about 41.0 percent, to as high as 62.0 percent for bulk cargo and between 29 percent and 89 percent for containerized freight.

Examining the methodologies and the market for shipping service, it is possible to make some general observations. First, in the case of bulk shipments, like that of crude oil, or gravel, or cement, as well as for project cargo like large machinery, there simply are no US-flagged vessels available. This means that consignees in Puerto Rico must either purchase these items from outside of the United States, or at a minimum ship domestically produced cargo from a Canadian or Mexican seaport. As Table 29 shows, based on data from PIERS and the Census Bureau, the product categories with the largest share coming from foreign ports (by tonnage) tend to be shipped by non-container ships. This includes products like coal, crude oil, beet sugar and soybeans, all of which are major US exports.

Table 29
Major Commodities Imported by Puerto Rico by Cargo Type

Product Category	Shipment Type	Foreign	Domestic	Pct Foreign
Extraction of natural gas and crude petroleum	Bulk	246,288.7	-	100.0%
Lead and zinc ore mining	Bulk	24.1	-	100.0%
Prefabricated wood building manufacturing	Project	687.8	-	100.0%
Nonferrous metal foundries	Breakbulk	5,387.2	-	100.0%
Iron and steel forging	Breakbulk	297.6	-	100.0%
Military armored vehicle, tank, and tank component manufacturing	Breakbulk	246.9	-	100.0%
Coal mining	Bulk	604,653.7	49.6	100.0%
Lime manufacturing	Bulk	2,368.6	12.1	99.5%
Printed circuit assembly (electronic assembly) manufacturing	Containerized	9,591.3	75.0	99.2%
Other engine equipment manufacturing	Mixed	108,384.1	919.3	99.2%
Oilseed farming	Bulk	25,412.5	367.1	98.6%
Secondary smelting and alloying of aluminum	Bulk	144.8	2.2	98.5%
Glass container manufacturing	Containerized	25,788.0	551.2	97.9%
Other aircraft parts and auxiliary equipment manufacturing	Mixed	273.4	7.7	97.3%
Beet sugar manufacturing	Bulk	128,552.1	4,307.8	96.8%
Asphalt paving mixture and block manufacturing	Breakbulk	29,076.0	1,351.4	95.6%
Power boiler and heat exchanger manufacturing	Project	12,048.1	601.9	95.2%
Broadwoven fabric mills	Containerized	52,536.8	3,094.2	94.4%
Other aluminum rolling, drawing and extruding	Breakbulk	9,561.3	609.6	94.0%
Animal production, except cattle and poultry and eggs	Project	7,003.1	450.8	94.0%

Since most bulk cargo is coming on foreign-flagged vessels and US-flagged ships are not generally available, the elimination of cabotage laws would shift these imports from far away sources to domestic ones, and the shipping cost differential would be due to time savings. A bulk cargo only example is presented in the fuels case study below, and would likely be a good proxy for savings for bulk shipments.

In the case of containerized shipments, it is more difficult to determine which set of assumptions would be most appropriate. Example 5 is based mainly on food imports. Example 3 is basically based on the costs of operating ships, and as was stated previously, that is not a good proxy in situations where markets are closed. In addition, many of these differences are old and may no longer be accurate. Example 1 likely provides the best proxy even though it is higher than the other examples simply because it is the most data driven of the models examined.

Table 30
Excess Costs to Puerto Rico Resulting From the Jones Act – JDA Recommended Example

Cargo Type	Estimated Additional				Total	Pct Change
	Water Transportation	Land Transportation	Wholesale	Retail		
Container	\$ 530,298,444	\$ 25,676,908	\$ 101,641,014	\$ 370,990,615	\$ 1,028,606,981	4.4%
Bulk	\$ 38,631,934	\$ 1,982,591	\$ 10,140,192	\$ 15,532,910	\$ 66,287,627	0.4%
Total	\$ 568,930,378	\$ 27,659,499	\$ 111,781,206	\$ 386,523,525	\$ 1,094,894,609	2.7%

Therefore, the recommended model would use a price differential of about 88.9 percent for containerized freight, and 58.8 percent for other shipments. The results of this example are presented in Table 30.

Table 31
Direct Cost Impact by Sector – Recommended Example

Sector	Shipping	Inland	Wholesale	Retail	Total
Agriculture	\$ 31,197,163	\$ 1,109,971	\$ 5,256,164	\$ 10,084,299	\$ 47,647,597
Business and Personal Services	\$ 75,849,734	\$ 2,640,263	\$ 10,538,656	\$ 40,135,015	\$ 129,163,668
Construction	\$ 20,580,365	\$ 902,880	\$ 5,734,963	\$ 12,292,116	\$ 39,510,324
Finance, Insurance and Real Estate	\$ 1,249,200	\$ 46,841	\$ 196,465	\$ 761,020	\$ 2,253,526
Government	\$ -	\$ -	\$ -	\$ -	\$ -
Manufacturing	\$ 501,820,722	\$ 21,209,285	\$ 72,309,390	\$ 226,123,547	\$ 821,462,943
Mining	\$ 1,885,220	\$ 5,028	\$ 399,078	\$ 334,419	\$ 2,623,744
Retailing	\$ 3,956,251	\$ 89,196	\$ 512,645	\$ 1,293,306	\$ 5,851,398
Transportation and Communication	\$ 21,883,001	\$ 312,437	\$ 1,979,095	\$ 7,415,656	\$ 31,590,189
Travel and Entertainment	\$ 80,724,232	\$ 2,732,272	\$ 8,687,634	\$ 22,414,453	\$ 114,558,590
Wholesaling	\$ 160,398	\$ 5,544	\$ 28,769	\$ 122,182	\$ 316,893
Other	\$ 287,969	\$ 7,591	\$ 46,255	\$ 120,478	\$ 462,293
Total	\$ 739,594,254	\$ 29,061,307	\$ 105,689,114	\$ 321,096,491	\$ 1,195,441,166

Based on the costs calculated under JDAs recommended example, the IMPLAN model for Puerto Rico was run in order to calculate the total economic impact of the Jones Act on the Commonwealth based on the cost differentials between Jones Act carriers and foreign-flagged ships, that JDA calculated for the recommended model. The total cost by economic sector is shown in Table 31. All told, the economy would experience about \$1.2 billion in additional costs, or roughly \$374 per resident. Nearly 69 percent of these costs will fall on the Commonwealth's manufacturing industry or on consumer and business purchases of manufactured goods.

Table 32
Economic Losses Resulting From the Jones Act – Recommended Example

	Direct	Supplier	Induced	Total
Jobs	10,100	1,680	1,460	13,250
Wages	\$ 238,917,430	\$ 54,787,760	\$ 43,579,370	\$ 337,284,560
Economic Output	\$ 1,082,498,910	\$ 205,827,080	\$ 174,593,500	\$ 1,462,919,480
	Federal	State and Local		Total
Taxes	\$ 52,753,055	\$ 53,678,557		\$ 106,431,612

Based on these increased costs estimated across each of the 367 industry sectors operating in Puerto Rico, the overall economic impact of the Jones Act under JDAs recommended assumptions is nearly \$1.5 billion. About 13,250 fewer jobs have been created in the Commonwealth's economy as a result of these higher costs, and tax revenues are as much as \$106.4 million lower

Table 33
Total Economic Losses By Sector Resulting From the Jones Act – Recommended Example

Sector	Jobs	Wages	Output
Agriculture	3,231	\$ 31,049,800	\$ 66,472,190
Business and Personal Services	3,333	\$ 108,482,200	\$ 216,540,770
Construction	444	\$ 15,632,000	\$ 42,284,900
Finance, Insurance and Real Estate	160	\$ 7,837,500	\$ 72,733,360
Government	15	\$ 1,200,900	\$ 1,416,480
Manufacturing	2,772	\$ 77,399,800	\$ 790,838,750
Mining	14	\$ 362,400	\$ 1,464,270
Retailing	434	\$ 11,316,500	\$ 30,754,580
Transportation and Communication	330	\$ 16,214,000	\$ 64,969,060
Travel and Entertainment	2,268	\$ 55,885,000	\$ 137,715,790
Wholesaling	225	\$ 11,421,600	\$ 37,028,650
Other	20	\$ 482,900	\$ 700,670
Total	13,246	\$ 337,284,600	\$ 1,462,919,470

The largest impacts fall on the manufacturing industry in the Commonwealth, with \$790.8 million in reduced output and about 2,770 fewer jobs than there would be were the Jones Act provisions to be eliminated. Construction, services, and the tourism industry have also been significantly impacted.

Model of How Shipping Costs Flow Through the Puerto Rican Economy:

These costs not only impact consignees, they cost consumers and businesses in the Commonwealth as well. Higher import costs are passed through to wholesalers and to retailers, each of which must mark up the higher costs to recoup their own higher carrying charges. As products move through the supply chain, they are marked up at each stage, eventually leading to higher than necessary costs to operate or live on the island.

The following two case studies examine different products that make their way to consumers through different means. The first, food, examines how agricultural products and consumer food items (like canned vegetables or packaged cereal) are marked up as they move from the dock through to retailers. The second, for fuel, examines how higher fuel costs (natural gas, coal, petroleum) impact businesses and consumers on the island through higher gasoline, diesel, and electricity rates.

Case Study: Food – pending data on prices requested from the PR Labor Department

Case Study: Fuel

Food imports are generally destined directly to retail stores, and are not going through additional manufacturing processes. However, the opposite is true for energy costs, including costs for shipping crude oil, liquified natural gas, fuel and coal. These commodities are used throughout the economy to produce things like electricity and chemicals, and to ship products and people. This means that any additional cost due to Jones Act requirements will spread and grow as it moves throughout the economy.

Table 34
Imports of Fuel Products into Puerto Rico

Category	2017 Imports (Short Tons)		
	Foreign	Domestic	Percent Foreign
Extraction of natural gas and crude petroleum	246,289	-	100%
Extraction of natural gas liquids	996,423	120,734	89%
Coal mining	604,654	50	100%
Petroleum refineries	6,329,460	2,733,372	70%
Total	8,176,825	2,854,155	74%

There is almost no US Flag capacity to ship non-containerized cargos to Puerto Rico. Rather, consignees have to either ship domestic US cargo via a port in Canada or Mexico, or purchase products from an international source. Since most bulk cargo is shipped on charters, and the market for tankers, bulk carriers, etc. is an open market, freight rates per ton or per ship are about the same. The differential in this case would be the longer transit times involved and therefore the higher chartering costs.

Based on charter rates and transit time data for gasoline and diesel fuel from various destinations to Puerto Rico, received from the United Retailers of Puerto Rico, there is a 58.8 percent cost differential for gasoline.⁷⁴

⁷⁴ According to United Retailers, it costs \$17,500 per day to charter a foreign flag tanker from seaports in Europe to San Juan. It takes a total of 17 days to load, transport and unload a cargo of 320,000 gallons of gasoline. This equates to a total shipping cost of \$297,50. To transport the same 320,000 gallons of gasoline from Houston to Puerto Rico on a foreign flag vessel under a Jones Act Waiver would cost the same \$17,000 per day, but total transit time would be just 7 days. The charter cost in this case would be just \$122,500, a 58.8 percent difference. While there are US tankers authorized to carry gasoline under the Jones Act, according to United Retailers, the daily charter rate would be \$75,000 per day for a total cost of \$525,000, making it prohibitive to engage in this transaction, even if a charter can be arranged for one of the remaining 57 tankers eligible to participate in the Jones Act trades.

Table 35
Direct Cost Impact by Sector – Fuel

Sector	Shipping	Inland	Wholesale	Retail	Total
Agriculture	\$ 8,088,486	\$ -	\$ 1,439,883	\$ 716,836	\$ 10,245,204
Business and Personal Services	\$ 2,372,688	\$ -	\$ 237,696	\$ 210,278	\$ 2,820,661
Construction	\$ 7,322,171	\$ -	\$ 1,467,070	\$ 648,922	\$ 9,438,162
Finance, Insurance and Real Estate	\$ 369,711	\$ -	\$ 37,038	\$ 32,765	\$ 439,514
Government	\$ -	\$ -	\$ -	\$ -	\$ -
Manufacturing	\$ 34,128,026	\$ -	\$ 4,460,698	\$ 3,046,007	\$ 41,634,731
Mining	\$ 1,967,589	\$ -	\$ 394,226	\$ 174,376	\$ 2,536,191
Retailing	\$ 2,792,983	\$ -	\$ 279,801	\$ 247,526	\$ 3,320,310
Transportation and Communication	\$ 9,782,751	\$ -	\$ 980,036	\$ 866,989	\$ 11,629,775
Travel and Entertainment	\$ 1,278,516	\$ -	\$ 128,082	\$ 113,307	\$ 1,519,905
Wholesaling	\$ 45,995	\$ -	\$ 4,608	\$ 4,076	\$ 54,679
Other	\$ 75,257	\$ -	\$ 7,539	\$ 6,670	\$ 89,466
Total	\$ 68,224,172	\$ -	\$ 9,436,675	\$ 6,067,751	\$ 83,728,598

As these higher costs flow through each of the 367 industry sectors operating in Puerto Rico, the overall economic impact of the Jones Act on energy shipments alone is \$96.9 million. About 1,130 fewer jobs will have been created in the Commonwealth’s economy as a result of these higher costs, and local tax revenues will be \$3.7 million lower. It is with products like petroleum or steel, products that are used in manufacturing or other processes in Puerto Rico, where the cost of the Jones Act is really felt.

Table 36
Economic Losses Resulting From the Jones Act – Fuel

	Direct	Supplier	Induced	Total
Jobs	940	70	110	1,130
Wages	\$ 19,444,100	\$ 2,719,680	\$ 3,335,480	\$ 25,499,260
Economic Output	\$ 73,295,720	\$ 10,234,510	\$ 13,363,050	\$ 96,893,280

	Federal	State and Local	Total
Taxes	\$ 3,758,000	\$ 3,667,260	\$ 7,425,260

The effects of these higher shipping costs are easy to see when one examines fuel cost differentials between Puerto Rico and mainland US areas. Comparisons are not exact since rather than imposing excise taxes at the pump like is commonplace on the mainland, Puerto Rico imposes a tariff of \$15.50 per barrel of oil brought into the country. According to the US Department of energy about 31 gallons of fuel are produced from a barrel of oil (including both gasoline and diesel). Other products are also produced, but applying this tax strictly on fuel production would mean that each gallon of gas is taxed at a rate of 50-cents. This is roughly equivalent to the 49.6-cents combined federal and state gasoline tax rates in the Southeastern US.

Figure 5
Comparative Gasoline Prices Between Puerto Rico and the Southwestern United States



Figure 5 shows how going back to Fiscal Year 2010, gasoline prices in Puerto Rico have been, on

average, about 5 percent higher than in the southeastern US.⁷⁵ This differential has been growing recently as oil prices in the United States have fallen well below world market prices.⁷⁶

Table 37
Total Economic Losses By Sector Resulting From the Jones Act – Fuel

Sector	Jobs	Wages	Output
Agriculture	605	\$ 4,443,600	\$ 10,806,300
Business and Personal Services	126	\$ 4,240,400	\$ 8,674,000
Construction	103	\$ 3,650,200	\$ 9,830,000
Finance, Insurance and Real Estate	13	\$ 618,400	\$ 5,504,300
Government	1	\$ 77,400	\$ 91,300
Manufacturing	79	\$ 4,430,800	\$ 40,604,300
Mining	13	\$ 348,500	\$ 1,408,200
Retailing	57	\$ 1,555,200	\$ 3,862,600
Transportation and Communication	61	\$ 4,432,600	\$ 11,230,700
Travel and Entertainment	55	\$ 1,082,100	\$ 2,992,900
Wholesaling	11	\$ 549,100	\$ 1,780,100
Other	3	\$ 71,100	\$ 108,600
Total	1,127	\$ 25,499,400	\$ 96,893,300

Based on the above shipping cost differentials, the IMPLAN model for Puerto Rico was run in order to calculate the total economic impact of the Jones Act on the Commonwealth based on the cost differentials between Jones Act carriers and foreign-flagged ships carrying all bulk commodities. The total cost by economic sector is shown in Table 38.

Table 38
Direct Cost Impact by Sector – Bulk Example

Sector	Shipping	Inland	Wholesale	Retail	Total
Agriculture	\$ 8,132,426	\$ 9,798	\$ 1,478,061	\$ 819,022	\$ 10,439,308
Business and Personal Services	\$ 4,856,603	\$ 74,615	\$ 486,413	\$ 791,530	\$ 6,209,160
Construction	\$ 7,093,429	\$ 7,753	\$ 1,471,152	\$ 955,169	\$ 9,527,503
Finance, Insurance and Real Estate	\$ 373,836	\$ 0	\$ 37,378	\$ 35,523	\$ 446,736
Government	\$ -	\$ -	\$ -	\$ -	\$ -
Manufacturing	\$ 51,081,365	\$ 526,856	\$ 6,540,078	\$ 7,731,886	\$ 65,880,185
Mining	\$ 1,967,432	\$ 10	\$ 394,226	\$ 174,511	\$ 2,536,180
Retailing	\$ 2,780,397	\$ 1,040	\$ 283,882	\$ 258,344	\$ 3,323,662
Transportation and Communication	\$ 9,751,536	\$ 10,514	\$ 983,061	\$ 930,540	\$ 11,675,651
Travel and Entertainment	\$ 2,199,805	\$ 38,415	\$ 327,048	\$ 377,635	\$ 2,942,903
Wholesaling	\$ 44,210	\$ 145	\$ 5,203	\$ 5,658	\$ 55,216
Other	\$ 74,443	\$ 52	\$ 7,989	\$ 7,101	\$ 89,585
Total	\$ 88,355,482	\$ 669,199	\$ 12,014,490	\$ 12,086,919	\$ 113,126,091

All told, the overall additional costs to Puerto Rican firms and consumers would be \$113.1 million (with \$83.7 million of that from fuel). Over 58 percent of these costs will fall on the Commonwealth's manufacturing industry or on consumer and business purchases of manufactured goods.

Table 39
Economic Losses Resulting From the Jones Act – Bulk Example

	Direct	Supplier	Induced	Total
Jobs	1,040	110	140	1,280
Wages	\$ 23,252,700	\$ 4,073,730	\$ 4,104,280	\$ 31,430,710
Economic Output	\$ 103,088,640	\$ 15,985,340	\$ 16,443,110	\$ 135,517,090

	Federal	State and Local	Total
Taxes	\$ 4,992,850	\$ 5,119,920	\$ 10,112,770

⁷⁵ Weekly Retail Gasoline and Diesel Prices: PADD 1C, US Department of Energy, at: https://www.eia.gov/dnav/pet/pet_pri_gnd_dcus_r1z_w.htm. Puerto Rico Economic Indicators: Gasoline, Economic Development Bank Office Of Economic Studies

⁷⁶ US oil prices as set by the West Texas Intermediate (WTI) price were \$53.60 per barrel on January 18, 2019. Brent Crude prices were \$62.04 on that same day. This means that crude imports into Puerto Rico coming from suppliers outside of the United States should be about 15.7 percent higher.

Based on these increased costs estimated across each of the 367 industry sectors operating in Puerto Rico, the overall economic impact of the Jones Act from bulk shipments only is \$135.5 million. About 1,280 fewer jobs have been created in the Commonwealth's economy as a result of these higher costs, and tax revenues on the island are as much as \$5.1 million lower

Table 40
Total Economic Losses By Sector Resulting From the Jones Act – Bulk Example

Sector	Jobs	Wages		Output
Agriculture	610	\$	4,603,500	\$ 11,092,800
Business and Personal Services	200	\$	6,910,700	\$ 14,647,400
Construction	100	\$	3,701,300	\$ 9,968,700
Finance, Insurance and Real Estate	20	\$	769,300	\$ 6,902,400
Government	-	\$	98,200	\$ 115,800
Manufacturing	110	\$	5,626,700	\$ 67,139,700
Mining	10	\$	348,600	\$ 1,408,600
Retailing	60	\$	1,724,400	\$ 4,328,800
Transportation and Communication	60	\$	4,593,100	\$ 12,119,500
Travel and Entertainment	80	\$	2,113,300	\$ 4,870,500
Wholesaling	20	\$	866,900	\$ 2,810,300
Other	-	\$	74,500	\$ 112,800
Total	1,270	\$	31,430,500	\$ 135,517,300

The largest impacts fall on the manufacturing industry in the Commonwealth, with \$67.1 million in reduced output and about 110 fewer jobs than there would be were the Jones Act provisions to be eliminated. Agriculture, services, and the tourism industry have also been significantly impacted. In addition, tax revenues are \$10.1 million lower just from the limits on the availability to ship bulk cargo from the mainland to Puerto Rico.

Conclusions:

The Merchant Marine Act of 1920 was passed by Congress and enacted into law nearly 100 years ago, and continues to harm the economy of Puerto Rico. In addition, rather than achieving any of the goals set forth in 1920, the Jones Act has severely hampered the development of the merchant marine and shipbuilding industries in the United States, has reduced waterborne coastwise trade, has increased prices, harmed the environment, and over time has measurably harmed the economy.

Because of the Jones Act, firms in Puerto Rico have limited shipping options, leading consignees in these areas to purchase more from foreign sources (Puerto Rico for example imports almost no heavy cargo from the US since ships are not available to carry it). This not only impacts prices for consumers, but also economic activity in these jurisdictions.

Dozens of studies have attempted to document these costs; however, the lack of public data sources has impeded the ability of researchers to fully examine how the Jones Act has affected Puerto Rico. This analysis uses a model of international shipping costs for 260 different commodities (both containerized and non-containerized) and compares this with 6 different estimates of domestic (US flag) shipping costs.

These higher costs not only impact importers in Puerto Rico, but they flow throughout the economy, effecting manufacturers, businesses and consumers.

Using JDAs recommended model, water transportation costs to Puerto Rico are \$568.9 million higher, and prices are \$1.1 billion higher than they would be without the Jones Act limitations. If this is the case, Puerto Rico has 13,250 fewer jobs than it would have were there a free market for ocean freight. These jobs would pay residents \$337.3 million more in wages, and would result in nearly \$1.5 billion in increased economic activity. Higher prices in Puerto Rico would cost the average resident nearly \$374 per year, or \$1,050 for a typical family of 2.8 members.

Overall tax revenues would be \$106.4 million higher were the island be exempted from the Jones Act's provisions.

Appendix Table One: Calculation of International Freight Rates (Example 1)

Commodity	Sector	Per Short Ton		
		International		Excess Cost
		Rate	Domestic Surcharge	
Carbon and graphite product manufacturing	Manufacturing	\$ 9,558.55	\$ 6,690	\$ 44,244
Biological product (except diagnostic) manufacturing	Manufacturing	\$ 6,311.29	\$ 3,916	\$ 6,263,420
Rolling mill and other metalworking machinery manufacturing	Manufacturing	\$ 2,301.72	\$ 1,428	\$ 42,505
Capacitor, resistor, coil, transformer, and other inductor manufacturing	Manufacturing	\$ 1,998.71	\$ 1,399	\$ 649,142
Ship building and repairing	Manufacturing	\$ 1,859.52	\$ 1,301	\$ 2,775,811
Bare printed circuit board manufacturing	Manufacturing	\$ 1,744.28	\$ 1,221	\$ 32,295
Propulsion units and parts for space vehicles and guided missiles manufacturing	Manufacturing	\$ 1,938.93	\$ 1,203	\$ 17,240
Nonwoven fabric mills	Manufacturing	\$ 1,700.24	\$ 1,190	\$ 3,233,219
Glass container manufacturing	Manufacturing	\$ 1,603.45	\$ 1,122	\$ 618,492
Sign manufacturing	Manufacturing	\$ 1,555.65	\$ 1,089	\$ 148,813
In-vitro diagnostic substance manufacturing	Manufacturing	\$ 1,454.42	\$ 1,018	\$ 8,595,729
Other aircraft parts and auxiliary equipment manufacturing	Manufacturing	\$ 1,338.48	\$ 937	\$ 7,228
Other apparel knitting mills	Manufacturing	\$ 1,335.19	\$ 934	\$ 56,652
Abrasive product manufacturing	Manufacturing	\$ 1,266.80	\$ 887	\$ 613,730
Analytical laboratory instrument manufacturing	Manufacturing	\$ 1,239.23	\$ 867	\$ 20,076
Totalizing fluid meter and counting device manufacturing	Manufacturing	\$ 1,107.44	\$ 775	\$ 5,980
Printing ink manufacturing	Manufacturing	\$ 1,096.39	\$ 767	\$ 2,510,357
Ophthalmic goods manufacturing	Manufacturing	\$ 1,094.98	\$ 766	\$ 83,628
Optical instrument and lens manufacturing	Manufacturing	\$ 1,045.06	\$ 731	\$ 37,892
Motor vehicle seating and interior trim manufacturing	Manufacturing	\$ 1,041.30	\$ 729	\$ 90,774
Leather and hide tanning and finishing	Manufacturing	\$ 975.52	\$ 683	\$ 541,095
Broadcast and wireless communications equipment manufacturing	Manufacturing	\$ 934.43	\$ 654	\$ 1,867,756
Search, detection, and navigation instruments manufacturing	Manufacturing	\$ 912.16	\$ 638	\$ 41,517
Audio and video equipment manufacturing	Manufacturing	\$ 870.60	\$ 609	\$ 3,867,199
Aircraft engine and engine parts manufacturing	Manufacturing	\$ 981.04	\$ 609	\$ 4,026
Surgical appliance and supplies manufacturing	Manufacturing	\$ 854.82	\$ 598	\$ 2,434,681
Dental equipment and supplies manufacturing	Manufacturing	\$ 851.55	\$ 596	\$ 53,868
Semiconductor machinery manufacturing	Manufacturing	\$ 809.48	\$ 567	\$ 94,296
Motor vehicle metal stamping	Manufacturing	\$ 806.91	\$ 565	\$ 155,624
Electronic computer manufacturing	Manufacturing	\$ 792.05	\$ 554	\$ 1,239,161
Fabric coating mills	Manufacturing	\$ 764.57	\$ 535	\$ 332,073
Surgical and medical instrument manufacturing	Manufacturing	\$ 759.57	\$ 532	\$ 10,185,895
Other engine equipment manufacturing	Manufacturing	\$ 837.67	\$ 526	\$ 483,965
Other communications equipment manufacturing	Manufacturing	\$ 743.72	\$ 520	\$ 95,241
Machine tool manufacturing	Manufacturing	\$ 724.64	\$ 507	\$ 167,148
Air conditioning, refrigeration, and warm air heating equipment manufacturing	Manufacturing	\$ 723.90	\$ 507	\$ 17,256,265
Jewelry and silverware manufacturing	Manufacturing	\$ 722.26	\$ 505	\$ 1,703,887
Broadwoven fabric mills	Manufacturing	\$ 715.74	\$ 501	\$ 1,549,907
Other electronic component manufacturing	Manufacturing	\$ 711.64	\$ 498	\$ 311,827
Apparel accessories and other apparel manufacturing	Manufacturing	\$ 707.65	\$ 495	\$ 1,167,163
Motor vehicle electrical and electronic equipment manufacturing	Manufacturing	\$ 685.31	\$ 480	\$ 3,892,695
Mens and boys cut and sew apparel manufacturing	Manufacturing	\$ 681.52	\$ 477	\$ 3,413,769
Footwear manufacturing	Manufacturing	\$ 681.22	\$ 477	\$ 7,171,325
Nonferrous metal, except copper and aluminum, shaping	Manufacturing	\$ 678.91	\$ 475	\$ 679,822
Valve and fittings, other than plumbing, manufacturing	Manufacturing	\$ 664.36	\$ 465	\$ 860,007
Fasteners, buttons, needles, and pins manufacturing	Manufacturing	\$ 651.72	\$ 456	\$ 169,433
Broom, brush, and mop manufacturing	Manufacturing	\$ 650.72	\$ 455	\$ 191,765
Glass product manufacturing made of purchased glass	Manufacturing	\$ 620.60	\$ 434	\$ 484,029
Industrial process variable instruments manufacturing	Manufacturing	\$ 601.69	\$ 421	\$ 126,256
Doll, toy, and game manufacturing	Manufacturing	\$ 598.24	\$ 419	\$ 3,341,334
All other miscellaneous electrical equipment and component manufacturing	Manufacturing	\$ 597.95	\$ 418	\$ 562,309
Travel trailer and camper manufacturing	Manufacturing	\$ 589.43	\$ 413	\$ 96,400
Watch, clock, and other measuring and controlling device manufacturing	Manufacturing	\$ 587.55	\$ 411	\$ 145,044
Power-driven handtool manufacturing	Manufacturing	\$ 639.87	\$ 397	\$ 914,230
Photographic film and chemical manufacturing	Manufacturing	\$ 562.77	\$ 394	\$ 187,119
Lighting fixture manufacturing	Manufacturing	\$ 561.83	\$ 393	\$ 1,396,048
Narrow fabric mills and schiffli machine embroidery	Manufacturing	\$ 560.47	\$ 392	\$ 380,058
Other cut and sew apparel manufacturing	Manufacturing	\$ 526.93	\$ 369	\$ 1,394,303
Overhead cranes, hoists, and monorail systems manufacturing	Manufacturing	\$ 516.95	\$ 362	\$ 257,626
Motor vehicle gasoline engine and engine parts manufacturing	Manufacturing	\$ 515.40	\$ 361	\$ 318,879
Forestry, forest products, and timber tract production	Agriculture	\$ 551.32	\$ 356	\$ 459,733
Printing machinery and equipment manufacturing	Manufacturing	\$ 506.49	\$ 354	\$ 65,642
Steel wire drawing	Manufacturing	\$ 498.32	\$ 349	\$ 354,060
Textile bag and canvas mills	Manufacturing	\$ 487.38	\$ 341	\$ 400,803
Office furniture, except wood, manufacturing	Manufacturing	\$ 487.27	\$ 341	\$ 257,495
Motorcycle, bicycle, and parts manufacturing	Manufacturing	\$ 485.27	\$ 340	\$ 810,863
Telephone apparatus manufacturing	Manufacturing	\$ 485.17	\$ 340	\$ 74,483
Pesticide and other agricultural chemical manufacturing	Manufacturing	\$ 467.72	\$ 327	\$ 7,308,878
Air and gas compressor manufacturing	Manufacturing	\$ 462.22	\$ 323	\$ 360,499
Other textile product mills	Manufacturing	\$ 458.78	\$ 321	\$ 680,959
Software and other prerecorded and record reproducing	Manufacturing	\$ 454.23	\$ 318	\$ 165,746

Commodity	Sector	Per Short Ton		
		International		Excess Cost
		Rate	Domestic Surcharge	
Womens and girls cut and sew apparel manufacturing	Manufacturing	\$ 450.85	\$ 316	\$ 3,723,301
Musical instrument manufacturing	Manufacturing	\$ 450.27	\$ 315	\$ 52,452
Mining machinery and equipment manufacturing	Manufacturing	\$ 506.18	\$ 314	\$ 103,169
Fiber, yarn, and thread mills	Manufacturing	\$ 435.71	\$ 305	\$ 202,351
Metal window and door manufacturing	Manufacturing	\$ 404.89	\$ 283	\$ 523,497
Other leather and allied product manufacturing	Manufacturing	\$ 404.29	\$ 283	\$ 1,775,899
Automatic environmental control manufacturing	Manufacturing	\$ 403.81	\$ 283	\$ 13,084
Cutlery, utensil, pot, and pan manufacturing	Manufacturing	\$ 399.63	\$ 280	\$ 578,980
Tire manufacturing	Manufacturing	\$ 399.51	\$ 280	\$ 2,984,624
Boat building	Manufacturing	\$ 392.18	\$ 274	\$ 327,050
Measuring and dispensing pump manufacturing	Manufacturing	\$ 441.95	\$ 274	\$ 119,399
Other aluminum rolling, drawing and extruding	Manufacturing	\$ 387.69	\$ 271	\$ 165,394
Small electrical appliance manufacturing	Manufacturing	\$ 382.40	\$ 268	\$ 2,289,495
Other rubber product manufacturing	Manufacturing	\$ 377.51	\$ 264	\$ 1,373,153
Welding and soldering equipment manufacturing	Manufacturing	\$ 376.86	\$ 264	\$ 136,063
Photographic and photocopying equipment manufacturing	Manufacturing	\$ 371.21	\$ 260	\$ 67,869
Chocolate and confectionery manufacturing from cacao beans	Manufacturing	\$ 358.64	\$ 251	\$ 3,759,470
Rope, cordage, twine, tire cord and tire fabric mills	Manufacturing	\$ 358.13	\$ 251	\$ 48,349
Other commercial service industry machinery manufacturing	Manufacturing	\$ 356.51	\$ 250	\$ 1,564,114
Other plastics product manufacturing	Manufacturing	\$ 353.63	\$ 247	\$ 14,146,926
Printing	Manufacturing	\$ 351.44	\$ 246	\$ 2,088,948
Small arms ammunition manufacturing	Manufacturing	\$ 344.10	\$ 241	\$ 105,122
Electromedical and electrotherapeutic apparatus manufacturing	Manufacturing	\$ 340.14	\$ 238	\$ 3,472,055
Stationery product manufacturing	Manufacturing	\$ 339.18	\$ 237	\$ 113,298
Crown and closure manufacturing and metal stamping	Manufacturing	\$ 337.90	\$ 236	\$ 258,847
Turned product and screw, nut, and bolt manufacturing	Manufacturing	\$ 335.91	\$ 235	\$ 495,995
Power boiler and heat exchanger manufacturing	Manufacturing	\$ 332.12	\$ 232	\$ 139,895
Relay and industrial control manufacturing	Manufacturing	\$ 321.29	\$ 225	\$ 90,717
Rubber and plastics hoses and belting manufacturing	Manufacturing	\$ 320.84	\$ 225	\$ 1,135,829
Gasket, packing, and sealing device manufacturing	Manufacturing	\$ 318.65	\$ 223	\$ 96,854
Greenhouse, nursery, and floriculture production	Agriculture	\$ 317.54	\$ 222	\$ 715,299
All other food manufacturing	Manufacturing	\$ 317.31	\$ 222	\$ 40,736,415
Sawmill, woodworking, and paper machinery	Manufacturing	\$ 314.20	\$ 220	\$ 127,255
Roasted nuts and peanut butter manufacturing	Manufacturing	\$ 306.86	\$ 215	\$ 695,500
Semiconductor and related device manufacturing	Manufacturing	\$ 306.54	\$ 215	\$ 657,655
Heating equipment (except warm air furnaces) manufacturing	Manufacturing	\$ 304.51	\$ 213	\$ 27,250
Animal production, except cattle and poultry and eggs	Agriculture	\$ 304.21	\$ 213	\$ 95,985
Cutting tool and machine tool accessory manufacturing	Manufacturing	\$ 341.98	\$ 212	\$ 28,302
Handtool manufacturing	Manufacturing	\$ 301.82	\$ 211	\$ 374,865
Other fabricated metal manufacturing	Manufacturing	\$ 301.73	\$ 211	\$ 2,142,398
Adhesive manufacturing	Manufacturing	\$ 301.53	\$ 211	\$ 1,466,887
Unlaminated plastics profile shape manufacturing	Manufacturing	\$ 298.36	\$ 209	\$ 313,495
Household cooking appliance manufacturing	Manufacturing	\$ 296.35	\$ 207	\$ 1,104,674
Toilet preparation manufacturing	Manufacturing	\$ 293.69	\$ 206	\$ 5,947,945
Soap and other detergent manufacturing	Manufacturing	\$ 283.50	\$ 198	\$ 8,057,366
Industrial mold manufacturing	Manufacturing	\$ 283.43	\$ 198	\$ 16,618
Knit fabric mills	Manufacturing	\$ 274.50	\$ 192	\$ 241,835
Tobacco product manufacturing	Manufacturing	\$ 274.16	\$ 192	\$ 1,251,250
Tobacco farming	Agriculture	\$ 273.38	\$ 191	\$ 51,460
Carpet and rug mills	Manufacturing	\$ 271.74	\$ 190	\$ 237,931
Fabricated structural metal manufacturing	Manufacturing	\$ 271.56	\$ 190	\$ 1,876,875
Curtain and linen mills	Manufacturing	\$ 269.59	\$ 189	\$ 1,773,597
Small arms, ordnance, and accessories manufacturing	Manufacturing	\$ 261.89	\$ 183	\$ 8,081
Hardware manufacturing	Manufacturing	\$ 256.93	\$ 180	\$ 421,780
Household refrigerator and home freezer manufacturing	Manufacturing	\$ 254.15	\$ 178	\$ 3,468,901
All other converted paper product manufacturing	Manufacturing	\$ 254.12	\$ 178	\$ 2,003,716
Meat processed from carcasses	Manufacturing	\$ 247.44	\$ 173	\$ 5,052,198
Lawn and garden equipment manufacturing	Manufacturing	\$ 270.32	\$ 173	\$ 435,241
Surface active agent manufacturing	Manufacturing	\$ 246.57	\$ 173	\$ 13,319,551
Motor and generator manufacturing	Manufacturing	\$ 242.34	\$ 170	\$ 4,674,115
Irradiation apparatus manufacturing	Manufacturing	\$ 240.57	\$ 168	\$ 46,582
Plastics packaging materials and unlaminated film and sheet manufacturing	Manufacturing	\$ 240.37	\$ 168	\$ 5,669,531
Vegetable and melon farming	Agriculture	\$ 230.61	\$ 161	\$ 13,931,359
Tree nut farming	Agriculture	\$ 226.87	\$ 159	\$ 184,645
Mineral wool manufacturing	Manufacturing	\$ 225.99	\$ 158	\$ 752,982
All other industrial machinery manufacturing	Manufacturing	\$ 225.73	\$ 158	\$ 184,413
Polish and other sanitation good manufacturing	Manufacturing	\$ 219.13	\$ 153	\$ 667,748
Lime manufacturing	Manufacturing	\$ 208.34	\$ 146	\$ 1,768
Farm machinery and equipment manufacturing	Manufacturing	\$ 206.71	\$ 145	\$ 386,869
Primary battery manufacturing	Manufacturing	\$ 206.55	\$ 145	\$ 1,193,950
Switchgear and switchboard apparatus manufacturing	Manufacturing	\$ 206.45	\$ 144	\$ 2,396,639
All other miscellaneous manufacturing	Manufacturing	\$ 206.05	\$ 144	\$ 888,086
Industrial process furnace and oven manufacturing	Manufacturing	\$ 204.45	\$ 143	\$ 22,555

Commodity	Sector	Per Short Ton		
		International	Domestic Surcharge	Excess Cost
		Rate		
Household laundry equipment manufacturing	Manufacturing	\$ 201.84	\$ 141	\$ 739,297
Other pressed and blown glass and glassware manufacturing	Manufacturing	\$ 201.06	\$ 141	\$ 299,831
Commercial fishing	Agriculture	\$ 199.56	\$ 140	\$ 1,444,685
Synthetic dye and pigment manufacturing	Manufacturing	\$ 194.05	\$ 136	\$ 741,333
Other animal food manufacturing	Manufacturing	\$ 192.72	\$ 135	\$ 1,174,497
Food product machinery manufacturing	Manufacturing	\$ 189.70	\$ 133	\$ 92,488
Pottery, ceramics, and plumbing fixture manufacturing	Manufacturing	\$ 189.44	\$ 133	\$ 643,024
Metal tank (heavy gauge) manufacturing	Manufacturing	\$ 186.93	\$ 131	\$ 703,307
Nonchocolate confectionery manufacturing	Manufacturing	\$ 202.40	\$ 131	\$ 884,645
Scales, balances, and miscellaneous general purpose machinery manufacturing	Manufacturing	\$ 185.08	\$ 130	\$ 571,982
Mattress manufacturing	Manufacturing	\$ 183.00	\$ 128	\$ 307,479
Other major household appliance manufacturing	Manufacturing	\$ 181.40	\$ 127	\$ 131,542
Power, distribution, and specialty transformer manufacturing	Manufacturing	\$ 179.11	\$ 125	\$ 159,865
Spice and extract manufacturing	Manufacturing	\$ 176.72	\$ 124	\$ 2,631,171
Metal barrels, drums and pails manufacturing	Manufacturing	\$ 175.49	\$ 123	\$ 964,455
Computer terminals and other computer peripheral equipment manufacturing	Manufacturing	\$ 171.03	\$ 120	\$ 723,057
Pharmaceutical preparation manufacturing	Manufacturing	\$ 171.02	\$ 120	\$ 4,846,099
Paper mills	Manufacturing	\$ 169.79	\$ 119	\$ 3,081,615
Animal, except poultry, slaughtering	Manufacturing	\$ 167.92	\$ 118	\$ 13,070,536
All other transportation equipment manufacturing	Manufacturing	\$ 166.19	\$ 115	\$ 272,115
Sporting and athletic goods manufacturing	Manufacturing	\$ 164.53	\$ 115	\$ 466,586
Ice cream and frozen dessert manufacturing	Manufacturing	\$ 161.72	\$ 113	\$ 1,659,174
Office supplies (except paper) manufacturing	Manufacturing	\$ 161.33	\$ 113	\$ 841,081
Bread and bakery product, except frozen, manufacturing	Manufacturing	\$ 159.57	\$ 112	\$ 2,342,646
Spring and wire product manufacturing	Manufacturing	\$ 158.43	\$ 111	\$ 478,969
Wood windows and door manufacturing	Manufacturing	\$ 155.81	\$ 109	\$ 80,171
Storage battery manufacturing	Manufacturing	\$ 150.84	\$ 106	\$ 1,256,870
Ball and roller bearing manufacturing	Manufacturing	\$ 150.76	\$ 106	\$ 19,307
Asphalt paving mixture and block manufacturing	Manufacturing	\$ 166.53	\$ 105	\$ 141,336
Seafood product preparation and packaging	Manufacturing	\$ 148.18	\$ 104	\$ 9,119,091
Industrial gas manufacturing	Manufacturing	\$ 162.99	\$ 102	\$ 817,081
Oilseed farming	Agriculture	\$ 161.46	\$ 101	\$ 37,128
Industrial truck, trailer, and stacker manufacturing	Manufacturing	\$ 141.79	\$ 99	\$ 561,468
All other miscellaneous wood product manufacturing	Manufacturing	\$ 141.51	\$ 99	\$ 297,808
Flat glass manufacturing	Manufacturing	\$ 138.32	\$ 97	\$ 178,307
Railroad rolling stock manufacturing	Manufacturing	\$ 138.17	\$ 97	\$ 18,866
Brick, tile, and other structural clay product manufacturing	Manufacturing	\$ 132.72	\$ 92	\$ 623,086
Copper rolling, drawing, extruding and alloying	Manufacturing	\$ 128.30	\$ 90	\$ 172,216
Sanitary paper product manufacturing	Manufacturing	\$ 128.09	\$ 90	\$ 3,398,661
Asphalt shingle and coating materials manufacturing	Manufacturing	\$ 127.60	\$ 89	\$ 574,358
Alumina refining and primary aluminum production	Manufacturing	\$ 122.52	\$ 86	\$ 842,321
Petrochemical manufacturing	Manufacturing	\$ 122.40	\$ 86	\$ 100,375
Other basic inorganic chemical manufacturing	Manufacturing	\$ 119.63	\$ 84	\$ 6,821,434
Paint and coating manufacturing	Manufacturing	\$ 116.71	\$ 82	\$ 1,974,184
Plastics material and resin manufacturing	Manufacturing	\$ 116.14	\$ 81	\$ 4,051,827
Cut stone and stone product manufacturing	Manufacturing	\$ 115.92	\$ 81	\$ 463,325
Other miscellaneous chemical product manufacturing	Manufacturing	\$ 115.49	\$ 81	\$ 438,709
Ferrous metal foundries	Manufacturing	\$ 115.17	\$ 81	\$ 174,769
Elevator and moving stairway manufacturing	Manufacturing	\$ 114.78	\$ 80	\$ 35,774
Cheese manufacturing	Manufacturing	\$ 114.50	\$ 80	\$ 3,892,258
Frozen fruits, juices and vegetables manufacturing	Manufacturing	\$ 114.47	\$ 80	\$ 2,771,907
Malt manufacturing	Manufacturing	\$ 113.03	\$ 79	\$ 207,607
Canned specialties	Manufacturing	\$ 111.99	\$ 78	\$ 1,835,579
Wood container and pallet manufacturing	Manufacturing	\$ 110.01	\$ 77	\$ 268,106
Creamery butter manufacturing	Manufacturing	\$ 120.64	\$ 75	\$ 195,641
Paperboard container manufacturing	Manufacturing	\$ 104.64	\$ 73	\$ 898,017
Dog and cat food manufacturing	Manufacturing	\$ 99.21	\$ 69	\$ 4,638,845
Synthetic rubber manufacturing	Manufacturing	\$ 99.18	\$ 69	\$ 151,876
Mayonnaise, dressing, and sauce manufacturing	Manufacturing	\$ 96.97	\$ 68	\$ 2,000,967
Paper bag and coated and treated paper manufacturing	Manufacturing	\$ 89.16	\$ 62	\$ 747,110
Breakfast cereal manufacturing	Manufacturing	\$ 87.53	\$ 61	\$ 810,938
Poultry processing	Manufacturing	\$ 87.32	\$ 61	\$ 11,240,583
Iron and steel mills and ferroalloy manufacturing	Manufacturing	\$ 87.51	\$ 61	\$ 1,746,219
Other nonmetallic minerals	Mining	\$ 92.07	\$ 58	\$ 328,895
Bottled and canned soft drinks & water	Manufacturing	\$ 82.57	\$ 58	\$ 7,968,904
Paperboard mills	Manufacturing	\$ 81.38	\$ 57	\$ 3,606,884
Aluminum sheet, plate, and foil manufacturing	Manufacturing	\$ 81.34	\$ 57	\$ 128,513
Canned fruits and vegetables manufacturing	Manufacturing	\$ 78.67	\$ 55	\$ 9,947,664
Stone mining and quarrying	Mining	\$ 78.28	\$ 55	\$ 68,176
Reconstituted wood product manufacturing	Manufacturing	\$ 77.80	\$ 54	\$ 41,291
Artificial and synthetic fibers and filaments manufacturing	Manufacturing	\$ 74.52	\$ 52	\$ 82,328
Construction machinery manufacturing	Manufacturing	\$ 78.92	\$ 51	\$ 579,046
Wineries	Manufacturing	\$ 68.76	\$ 48	\$ 354,581
Sawmills	Manufacturing	\$ 68.03	\$ 48	\$ 1,902,175
Miscellaneous nonmetallic mineral products manufacturing	Manufacturing	\$ 67.61	\$ 47	\$ 255,096
All other crop farming	Agriculture	\$ 67.39	\$ 47	\$ 101,433
Dry pasta, mixes, and dough manufacturing	Manufacturing	\$ 64.69	\$ 45	\$ 1,126,494
Wood preservation	Manufacturing	\$ 64.15	\$ 45	\$ 1,216,569
Concrete block and brick manufacturing	Manufacturing	\$ 70.41	\$ 44	\$ 225,313
Dry, condensed, and evaporated dairy product manufacturing	Manufacturing	\$ 62.00	\$ 43	\$ 2,515,027
Veneer and plywood manufacturing	Manufacturing	\$ 60.10	\$ 42	\$ 543,788
Other clay, ceramic, refractory minerals mining	Mining	\$ 58.46	\$ 41	\$ 29,046
Beet sugar manufacturing	Manufacturing	\$ 61.00	\$ 39	\$ 167,877
Coffee and tea manufacturing	Manufacturing	\$ 54.72	\$ 38	\$ 180,626
Petroleum lubricating oil and grease manufacturing	Manufacturing	\$ 54.70	\$ 38	\$ 73,672
Nitrogenous fertilizer manufacturing	Manufacturing	\$ 54.99	\$ 38	\$ 602,868
Sugarcane and sugar beet farming	Agriculture	\$ 58.95	\$ 37	\$ 2,500
Sand and gravel mining	Mining	\$ 51.33	\$ 36	\$ 150,818
Fats and oils refining and blending	Manufacturing	\$ 50.53	\$ 35	\$ 1,543,252
Other chemical and fertilizer mineral mining	Mining	\$ 49.17	\$ 34	\$ 999,823
Fruit farming	Agriculture	\$ 44.72	\$ 31	\$ 1,636,784

Commodity	Sector	Per Short Ton		
		International		Excess Cost
		Rate	Domestic Surcharge	
* Not an industry (Scrap)	Other	\$ 44.58	\$ 30	\$ 1,440,857
Aircraft manufacturing	Manufacturing	\$ 38.37	\$ 27	\$ 5,980
Fluid milk manufacturing	Manufacturing	\$ 37.29	\$ 26	\$ 680,637
Commercial logging	Agriculture	\$ 32.41	\$ 23	\$ 158,688
Breweries	Manufacturing	\$ 31.96	\$ 22	\$ 3,128,906
Phosphatic fertilizer manufacturing	Manufacturing	\$ 31.77	\$ 22	\$ 496,687
Gypsum product manufacturing	Manufacturing	\$ 29.62	\$ 21	\$ 253,181
Other basic organic chemical manufacturing	Manufacturing	\$ 26.73	\$ 19	\$ 2,333,466
Soybean and other oilseed processing	Manufacturing	\$ 25.83	\$ 17	\$ 653,519
Nonferrous metal (exc aluminum) smelting and refining	Manufacturing	\$ 24.68	\$ 17	\$ 10,909
Cement manufacturing	Manufacturing	\$ 23.70	\$ 16	\$ 295,712
Wet corn milling	Manufacturing	\$ 18.93	\$ 13	\$ 2,105,374
Extraction of natural gas liquids	Mining	\$ 19.42	\$ 12	\$ 1,456,247
Flour milling	Manufacturing	\$ 18.84	\$ 12	\$ 532,659
* Not an industry (Used and secondhand goods)	Other	\$ 16.55	\$ 12	\$ 6,020,489
Coal mining	Mining	\$ 17.93	\$ 11	\$ 552
Grain farming	Agriculture	\$ 17.14	\$ 11	\$ 1,349,352
Petroleum refineries	Manufacturing	\$ 14.25	\$ 9	\$ 24,180,236
* Not an industry (Noncomparable foreign imports)	Other	\$ 11.73	\$ 7	\$ 381,632
Distilleries	Manufacturing	\$ 11.21	\$ 7	\$ 865,147
Sugar cane mills and refining	Manufacturing	\$ 10.21	\$ 6	\$ 526,273
Rendering and meat byproduct processing	Manufacturing	\$ 0.82	\$ 1	\$ 1,452
Dehydrated food products manufacturing	Manufacturing	\$ 0.76	\$ 1	\$ 2,334
Turbine and turbine generator set units manufacturing	Manufacturing	\$ 0.42	\$ 0	\$ 423
Secondary processing of other nonferrous metals	Manufacturing	\$ 0.01	\$ 0	\$ 1

Appendix Table Two: Comparison of International To Estimated Domestic Freight Rates

Sector	Per Metric Ton		
	Avg Foreign	Avg Domestic	Difference
Agriculture	\$ 68.69	\$ 156.56	127.9%
Manufacturing	\$ 70.64	\$ 153.43	117.2%
Mining	\$ 2.64	\$ 47.48	1697.2%
Other	\$ 28.28	\$ 30.95	9.4%

Note: Other consists mostly of empty containers and other equipment, and therefore the calculations are based on declared values – which are mostly zero.

Appendix Table Three: Prior Studies Utilized in this Analysis

Study	Based on	Difference Factor	
		Container	Bulk/other
Simat, Helliesson, & Eichner, Inc., The Jones Act and its Impact on the State of Alaska, Vol. II: Final Report, prepared for the Alaska Statehood Commission, July 1982	Operating Costs	1.133	1.34799
Comparison of U.S. and Foreign-Flag Operating Costs, US Department of Transportation, Maritime Administration, September 2011	Operating Costs	2.21162	3.04047
Economic Impact of the Jones Act on the Commonwealth of Puerto Rico: Setting the Record Straight, Reeve & Associates, April 2003	Prices	1.09848	
Study of the Economic Impact of Cabotage, and Alternative Strategies to Cabotage in US Trade. E.G. Frankel & Associates, prepared for the Government Development Bank of Puerto Rico	Tariffs	1.43	
Abel, Jaisón, et. al., Report on the Competitiveness of Puerto Rico's Economy, Federal Reserve Bank of New York, June 29, 2012	Prices	1.91977	
The Economic Effects of Significant U.S. Import Restraints: Third Update 2002, US International Trade Commission, Investigation No: 332-325, June 2002	Operating Costs	1.1894	1.9906
A Study on the Impact of Repeal of the Jones Act on the Economy of Puerto Rico, Puerto Rico Management & Economic Consultants, Inc. for Navieras de Puerto Rico, June 1994	Operating Costs	1.104	1.104
Lewis, Justin, Veiled Waters: Examining the Jones Act's Consumer Welfare Effect, 2013	Operator Profits	1.61	
Suarez-Gopmez, William and Auyala-Cruz, Jorge, Maritime cabotage in Puerto Rico's agribusiness supply chain, Doctoral Dissertation, Universidad ICESI, August 11, 2016	Freight Rates	2.16667	
The Economic Effect of Significant U.S. Import Restraints, US International Trade Commission, Investigation No. 332-325, Publication 2699, November 1993	Operating Costs	1.1	2.47
Impact of the U.S. Jones Act on Puerto Rico, Reeve & Associates and Estudios Tecnicos, Inc., prepared for the American Maritime Partnership, July 2018	One Price	1.41	
Report on the Competitiveness of Puerto Rico's Economy, Federal Reserve Bank of New York, June 29, 2012	Freight Rates	1.8156	

About John Dunham & Associates:

John Dunham and Associates (JDA) is a leading New York City based economic consulting firm specializing in the economics of fast-moving issues. JDA is an expert at translating complex economic concepts into clear, easily understandable messages that can be transmitted to any audience. Our company's clients include a wide variety of businesses and organizations, including some of the largest Fortune 500 companies in America, such as:

- Altria
- Diageo
- Feld Entertainment
- Forbes Media
- MillerCoors
- Verizon
- Wegmans Stores

John Dunham is a professional economist with over 25 years of experience. He holds a Master of Arts degree in Economics from the New School for Social Research as well as a Masters of Business Administration from Columbia University. He also has a professional certificate in Logistics from New York University. Mr. Dunham has worked as a manager and an analyst in both the public and private sectors. He has experience in conducting cost-benefit modeling, industry analysis, transportation analysis, economic research, and tax and fiscal analysis. As a senior economist for Philip Morris, he developed tax analysis programs, increased cost-center productivity, and created economic research operations. He has presented testimony on economic and technical issues in federal court and before federal and state agencies.

Prior to Phillip Morris John was an economist with the Port Authority of New York and New Jersey, the Philadelphia Regional Port Authority and the City of New York's Department of Ports & Trade.