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Changing Trade and Transportation Patterns: NAFTA, Cuba, and the US Gulf Coast

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ABSTRACT

This report deals with several interrelated issues of transportation, trade, and tariffs. It examines the impacts of the Trump Administration's tariff policies on the economy of Louisiana as measured by freight movement through the Lower Mississippi River port complex. Two quantitative approaches were employed, an Import-Export Analysis for soybeans, corn, steel, and aluminum and Input-Output Analysis of employment and labor productivity. The analyses indicate that the tariffs on steel and aluminum implemented during the Trump Administration in 2018, and currently still in place, led to a retaliatory decline in exports of corn and soybeans from all three Louisiana ports exporting these grains and negative impacts on both employment and labor productivity in the Transportation and Warehousing sector in the port cities and the state. The report also examines the relationships between the U.S. transportation and trade coalitions and how changes in freight movements brought about by the tariffs as well as other exogenous factors such as the emergence of the U.S. as a net energy exporter, the benefits of Short Sea Shipping, and the potential role of Cuba as a transport hub to the southern hemisphere continue to shape transportation policy. Going forward, it recommends better coordination and cooperation between the U.S. transportation and trade coalitions to improve the benefits to both the industries and the nation.

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PROJECT DESCRIPTION

On March 1, 2018, President Donald Trump announced his intention to impose a 25% tariff on steel and a 10% tariff on aluminum imports regardless of the country of origin. On March 8, he signed an order to impose the tariffs effective after 15 days (Swanson, 2018a). Almost immediately, many nations took retaliatory action to impose tariffs on U.S. exports including agricultural products (Swanson, 2018b; Rodriguez, 2018; CRS, 2019). The entire U.S. economy was affected by these actions and this report examines the impacts of the Trump Administration's tariff policies on the economy of Louisiana as measured by freight movement through the Lower Mississippi River port complex and resultant impacts on the Transportation and Warehousing sector in Louisiana.

It begins with an Import-Export Analysis for soybeans, corn, steel, and aluminum through the five ports comprising the Lower Mississippi River Region (LMRR): the Port of South Louisiana, Port of Greater Baton Rouge, Port of New Orleans, Plaquemines Port Harbor and Terminal District, and St. Bernard Port, Harbor and Terminal District. This is followed by an Input-Output Analysis of employment and labor productivity for the Transportation and Warehousing sector. These analyses indicate that the tariffs on steel and aluminum implemented during the Trump Administration in 2018, and currently still in place, led to a retaliatory decline in exports of corn and soybeans from the three Louisiana ports exporting these grains and negative impacts on both employment and labor productivity in the Transportation and Warehousing sector in the port cities and the state of Louisiana. The report then examines U.S. transportation and trade coalitions and how changes in freight movements brought about by the tariffs and other exogenous factors have impacted transportation policy. It employs the Advocacy Coalition Framework (ACF) promulgated by Sabatier and Jenkins-Smith to understand and explain changes in transportation and trade policy through the lens of different actors forming coalitions of power. It finds that future tariff policy should be informed by a better understanding of the interactions between trade and transportation and emphasizes the potential value of a joint trade-transportation coalition in future policy making.

THE LOWER MISSISSIPPI RIVER PORT COMPLEX

The Lower Mississippi River Region (LMRR) is the largest port complex by tonnage in the U.S., therefore it plays a significant part in the global supply chain. The LMRR which is comprised of the five major ports of Louisiana: the Port of South Louisiana, Port of Greater Baton Rouge, Port of New Orleans, Plaquemines Port Harbor and Terminal District, and St. Bernard Port, Harbor and Terminal District (Figure 1), carries 25% of all U.S. waterborne commerce and 60% of the nation's grain (Accardo, 2016).

The five major ports of Louisiana are strategically located on the lower Mississippi River, within two major metropolitan areas of the state: New Orleans-Metairie Metro Statistical Area (NMSA) and the Baton Rouge Metropolitan Area (BRMA). Louisiana is ranked the second highest importer of steel and aluminum in the country, with most of the products coming through the Port of New Orleans, which imported 2.48 million tons of steel in 2017 (the year before the tariff hike implementation), accounting for about 30% of its general cargo tonnage and 80% of its breakbulk. Louisiana's ports are also top exporters of agricultural products to international markets, with nearly 70% market share of export grain from the U.S. Midwest (Joe, 2018). These

ports are impacted by the trade war because high volumes of steel and aluminum are imported from China, while high volumes of grains are exported to China. See Table 1 for a port-by-port breakdown.

Figure 1. Lower Mississippi River Complex: Five Major Ports of Louisiana
Source: (Mississippi River Cruises, 2013)

Table 1. Features of Louisiana Ports

Louisiana Ports/ Location	Features
Port of South Louisiana - BRMA	Exports nearly 300 million tons annually; Highest cargo tonnage in the U.S.
St. Bernard Port, Harbor and Terminal District - NMSA	Ships 36% of U.S. ferro alloys.
Plaquemines Port Harbor and Terminal District - NMSA	Moves over 55 million tons of grain, petrochemicals, crude oil, and coal annually.
Port of Greater Baton Rouge - BRMA	Moves 11% of LA's Grain. Home to Largest Grain Elevator on Mississippi. Container-on-Barge Services: A partnership between the Port of Greater Baton Rouge and Port of New Orleans provides advantages for moving cargo by water utilizing "America's Marine Highway," specifically the M-55.
Port of New Orleans - NMSA	Fastest Growing Import/Export Container Port in 2015 – Has 800,000 TEU Capacity; Highest tonnage of steel in 2017. Only Port Served by All Six Class 1 Railroads.

Source: (Ports Association of Louisiana, 2016)

METHODOLOGICAL APPROACH

Using the import and export data for steel, aluminum, corn, and soybeans obtained from the five major ports of Louisiana, the following analyses utilized a quantitative approach of data estimation (Cresswell, 2014). Transportation and Warehousing GDP, and job numbers were obtained from the Bureau of Economic Analysis (BEA). The cargo volumes are the dependent variables while the tariff increase is the independent variable. See Tables 2 and 3.

Table 2. Data Types, Sources, & Period

Source (Ports)	Type	Period
Port of New Orleans	Imports volumes: steel & aluminum	2014-2020
Port of Greater Baton Rouge	Export volumes: corn & soybeans	2014-2020
Port of South Louisiana	Export volumes: corn & soybeans	2014-2020
Plaquemines Port Harbor and Terminal District	Export volumes: corn & soybeans Import volumes: steel & aluminum	2014-2020 2014-2020
St. Bernard Port, Harbor and Terminal District	Louisiana GDP in relation to Transportation Industry	2014-2020
Bureau of Economic Analysis	Louisiana Transportation Jobs in relation to total employment	2014-2020

Table 3. Variables (for 5 major ports of Louisiana and Louisiana GDP)

Dependent Variables	Independent Variables
Exports volumes (corn, soybeans) Imports volumes (steel and aluminum) Louisiana GDP Louisiana Transportation Jobs	Trade Policies: Trump Administration tariffs on steel and aluminum

The following cardinal questions were developed to guide the research and ensure the delivery of valid results:

Q1. How do the Trump Administration's international trade policies affect total trade volumes in the five major ports of Louisiana?

Q2. How do the trade policies impact jobs and economic growth (GDP) in Louisiana?

To analyze the impact of trade policies on cargo volumes, at the same time control for lagging effects of the policy and other confounds, the research will utilize multivariate time series analysis using the Auto-Regressive Integrated Moving Average (ARIMA) modelling. The study will utilize the Input-Output approach to analyze the impact of the international trade policies on transportation jobs and economic growth of port city regions and the state of Louisiana.

To ensure adequate control for confounds and other variables that may distort the validity of analysis, the research controlled for the following variables.

1. Port fixed-effects: To avoid omitted bias as a result of differences in the characteristics of the five Louisiana ports (difference in size, capacity, automation, etc.) the analysis used fixed-effect regression.
2. Gross Domestic Product (GDP): The analysis also controlled for national productivity (GDP), since it is the major economic determinant of the performance of all industries within the nation. Productivity in the U.S. varies in different periods which can affect the productivity of the ports under consideration, or even other economic development impacts.
3. COVID-19: Because the COVID-19 pandemic has been a major disruptor of the entire supply chain system, it was necessary to control for the pandemic.
4. Seasonality: Soybeans and corn are seasonal agricultural goods, they therefore have peak periods usually during harvests and low periods, usually after the produce has been harvested. This may also affect the cargo volumes that move through the ports.

The analyses utilized two quantitative approaches, the Auto Regressive Integrated Moving Average (ARIMA) which was used for the evaluation of import and export volumes in relation to the tariff policy, while the Input-Output approach was utilized to examine the reactions of jobs and economic productivity in the period preceding the implementation of the tariff increase.

Import and Export Analysis Using ARIMA

The Auto Regressive Integrated Moving Average (ARIMA) method was used to analyze how the increases in steel and aluminum tariffs affected imports of steel and aluminum. It also determined the impact of the resultant retaliations by trade partner nations who were major customers of America's corn and soybeans. ARIMA combines autoregressive (AR) differencing (I) and moving average (MA) components to capture the underlying patterns and dependencies in time series data. The AR component accounts for the dependency of the current observation on past observations, by assuming that the value of a variable at any given time is a linear combination of previous values. It is represented by the parameter p, denoting the number of lagged observations considered (Box, Jenkins, Reinsel, and Ljung, 2015), while the Integrated component (I) accounts for the differencing process applied to the time series data to achieve stationarity. It involves subtracting the previous observation from the current observation to remove any trend or seasonality. The integration parameter, denoted d, represents the number of differing steps required to make the data stationary (Brockwell and Davis, 2016). The moving average (MA) component considers the dependency between the current observation and a residual error from a combination of past observations. It assumes that the current observation depends on the average of past errors. The MA component is represented by the parameter q, which denotes the number of lagged residuals considered (Hyndman and Athanasopoulos, 2018).

> According to Box et. al. (2015), ARIMA can be mathematically derived as follows: The AR component is expressed, thus: $X_t = c + \varphi_1 X_t\text{-}1 + \varphi_2 X_t\text{-}2 + ... + \varphi p X_t\text{-}p + \varepsilon t$ Where, X_t represents the value of the time series at time t, c is a constant term, φ_1, φ_2…..φp are the autoregressive coefficients, $X_t\text{-}1$, $X_t\text{-}2$,….$X_t\text{-}p$ are lagged

observations, and εt is the white noise error term. The integrated component is expressed as follows: $\nabla dX_t = (1 - B)^dX_t$ Where, B is the backward shift operator representing the differencing process (Brockwell and Davis 2016). The Moving Average Component: $X_t = \mu + \theta_1\varepsilon t\text{-}1 + \theta_2\varepsilon t\text{-}2 + ... + \theta q\varepsilon t\text{-}q + \varepsilon t$ Here, the μ is the mean of the time series, θ_1, θ_2…. Θq are moving average coefficients, εt-1, εt-2,….εt-q are lagged residuals, and εt is the white noise error term (Hyndman and Atahnasopoulous 2018).

Analyzing the impacts of the Trump Administration's international trade policies using ARIMA in R-studio involved the following steps:

1. Data Collection and Preparation: involved collecting cargo volumes data from the ports which were in Excel files, which were converted into CSV file before imputation into R-studio.
2. Data Exploration: involved the exploration of data to gain insights into its characteristics, such as trends, seasonality, or outliers. Then further data transformation or preprocessing steps were carried out to address issues like missing values, outliers or non-stationarity.
3. ARIMA Model Identification: entails the determination of the appropriate order of the ARIMA model (p,d,q) based on the characteristics of the data. In this situation I utilized the autocorrelation function (ACF) plots. Then used the functions acf() to plot the ACF to identify potential AR and MA terms.
4. Estimation of the ARIMA model using the identified order (p, d, and q) with the arima () function in R-studio. Then evaluating the model's goodness of fit by examining diagnostic statistics, such as AIC (Akaike Information Criterion) or BIC (Bayesian Information Criterion), to access the model's performance. Also, conducting residual analysis to check for any reaming patterns or autocorrelation in the model residuals. Plot the residuals using plot() and examine ACF plots of the residuals using acf().
5. Splitting the data into training and test sets. Typically, the earlier portion of the data was used for model training, and the later portion is used for model validation. Then validated the ARIMA model by comparing the model's predictions to actual values in the validation set. Generation of forecasts for a ten-year period using the ARIMA trained model.
6. Entails the analysis of the results to understand the impacts of Trump's tariff policy on the ports, where we draw our conclusions.

Input-Output Analysis: Job Numbers and Economic Productivity

The Input-Output approach was utilized to obtain the reaction of the Louisiana economy to the tariff policies of the Trump Administration. Input-Output analysis is a quantitative economic technique that examines the relationships within the economy by tracing the flow of inputs and outputs (Leontif, 1936). By capturing the circular flow of goods, services, and resources, input-output analysis provides a holistic view of an economy's structure and functioning. Input-Output data used in this research was obtained from the U.S. Bureau of Economic Analysis, a national economic data hub that classifies the economic sectors of the country into various industry

groupings. The Transportation and Warehousing Industry is the classification that best matches the area of study because it contains all aspects of the transportation industry, one of the key industries of Louisiana, employing hundreds of thousands of people and providing high tax revenues for the state. According to a Ports Association of Louisiana presentation (2023), the Louisiana ports generate 525,000 jobs (1 in 5 jobs within the state), with employees earning up to $32.9 billion annually. This is 45% more jobs than generated by Louisiana's oil and gas industry.

A difficulty in analyzing the Transportation and Warehousing sector is that there is further micro classification within the industry for which specific data is not available due to business confidentiality issues. For example, the broader Transportation and Warehousing sector is further broken down into micro sectors such as water transportation, rail transportation, truck transportation, warehousing, and storage but it is almost impossible to obtain sufficient data points for analysis when investigating a single micro sector. However, the input-output approach usually shows how the industry micro sectors interact with each other, and with the rest of the industries within the economy. Data estimates at all levels of aggregation reflect the highly detailed and accurate data available during an economic census year (Bureau of Economic Analysis, 2008).

Employment and output multipliers were used to analyze the impacts of tariff policy on employment and economic productivity within the transportation and warehousing sector. In an input-output framework, these multipliers quantify the indirect effects of changes in final demand on employment and output in the economy. The following variables were used in this analysis:

$x = [x_1,x_2,\ldots.x_n]$ represents the vector of the sectoral demands, where x_i is the output of the Warehousing and Transportation Industry.

$y = [y_1,y_2\ldots.y_n]$ represents the vector of sectoral outputs, where y_i is the output of sector i.

$A = [a_{ij}]$ is the input-output matrix, where a_{ij} represents the quantity of inputs required from sector i to produce one unit of output in sector j.

I is an identity matrix size n.

$L = [L_1,L_2\ldots..Ln)$ represents the vector of direct employment, where Li is the direct employment sector in i.

$E = [E_1,E_2\ldots.En]$ represents the vector of total employment, where Ei is the total employment (direct plus indirect) in sector i.

Using the variables, the formula for input-output analysis becomes:

Total output (y): $y = A_x + y$

This equation represents the total output of each sector, which is determined by demand for final goods and services (A_x) and the sector's own production (y).

Direct employment (L): $L = B_y$

Here, B is a matrix that represents the employment coefficients. The elements of matrix B, denoted as b_{ij}, represent the direct employment in sector I per unit of output in sector j.

Total employment (E) = E= L+BL

This equation calculates the total employment (E) in each sector, which includes both direct and indirect employment.

Employment Multiplier (EM): EM = (i-B)^(-1)L

EM measures the total employment generated by a unit increase in final demand.

Outlier Multiplier (OM): OM = (I-A)^(-1)y

OM quantifies the total increase in output resulting from a unit increase in final demand.

FINDINGS

Export Analysis for Corn and Soybeans in relation to the Tariff Policy

Cargo volume data for corn and soybean exports for the period 2014 to 2020 were obtained from three of the five major ports of Louisiana that engage in grain exports (Port of South Louisiana, Port of Greater Baton Rouge, and Plaquemines Port Harbor and Terminal District). The analysis examines the resultant effects of the retaliatory actions by buyers of American grains who were affected by the increase in the steel and aluminum tariff. Corn and soybeans data obtained from two of the ports were merged, so it was decided to merge the other data for uniformity. Multivariate time series analysis using ARIMA modelling was run, and the following results were obtained.

Soybean and Corn Exports for Plaquemines Port Harbor and Terminal District

In multivariate time series analysis using ARIMA modelling, the Trump Administration's tariff policy led to a decline in the export of corn and soybeans at Plaquemines Port Harbor and Terminal District, though it is not statistically significant. See Figure 2.

	Dependent variable:
	[
ar1	0.262**
	(0.113)
intercept	873,765.900*
	(505,570.800)
Trump	-54,674.770
	(59,176.120)
gdp_exp	-257.292
	(333.337)
covid	-107,994.500
	(101,732.500)
month	-12,456.300**
	(5,327.234)
Observations	84
Log Likelihood	-1,117.150
sigma2	20,838,701,493.000
Akaike Inf. Crit.	2,248.299
Note:	*p<0.1; **p<0.05; ***p<0.01

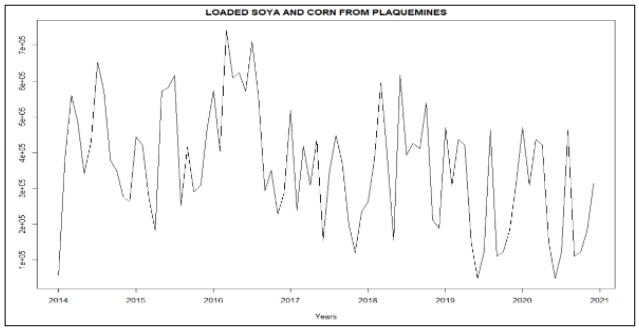

Figure 2. Soybean and Corn Exports from Plaquemines Port Harbor and Terminal District

Soybean and Corn Exports from the Port of Greater Baton Rouge

In multivariate time series analysis using ARIMA modelling, the Trump Administration's tariff policy led to a statistically significant reduction in the export of corn and soybeans from the Port of Greater Baton Rouge. See Figure 3.

Soybean and Corn Exports from the Port of South Louisiana

In multivariate time series analysis using ARIMA modelling, the Trump Administration's tariff policy led to a statistically significant reduction in exports of corn and soybeans from the Port of South Louisiana. See Figure 4.

	Dependent variable:
	[
ar1	0.432
	(0.330)
ar2	0.180
	(0.359)
ar3	-0.519**
	(0.237)
ar4	0.591***
	(0.201)
ar5	0.091
	(0.324)
ar6	-0.121
	(0.210)
ma1	-0.048
	(0.299)
ma2	-0.192
	(0.241)
ma3	0.407**
	(0.164)
ma4	-0.544***
	(0.160)
ma5	-0.622**
	(0.252)
intercept	270,422.400
	(541,444.000)
Trump	-256,666.400**
	(123,236.000)
rmonth	4,710.358**
	(2,131.365)
gdp_exp	51.384
	(338.394)
covid	-172,241.000*
	(91,802.860)
Observations	84
Log Likelihood	-1,103.649
sigma2	14,071,388,451.000
Akaike Inf. Crit.	2,241.299
Note:	*p<0.1; **p<0.05; ***p<0.01

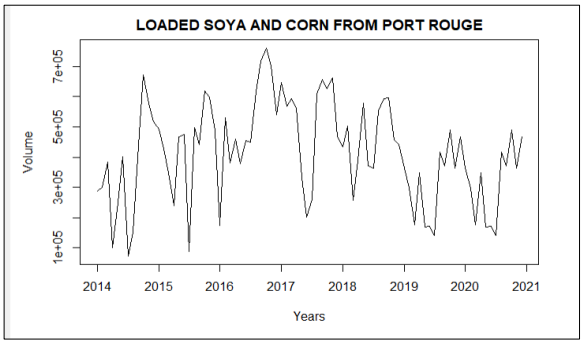

Figure 3. Soybeans and Corn Exports from Port of Greater Baton Rouge

	Dependent variable:
	[
ar1	0.569***
	(0.091)
intercept	-5,638,417.000**
	(2,497,006.000)
Trump	-1,421,040.000***
	(482,814.700)
rmonth	24,110.750**
	(9,909.036)
gdp_exp	3,653.179**
	(1,554.101)
covid	407,670.700
	(418,326.200)
Observations	84
Log Likelihood	-1,220.764
sigma2	244,693,416,220.000
Akaike Inf. Crit.	2,455.527
Note:	*p<0.1; **p<0.05; ***p<0.01

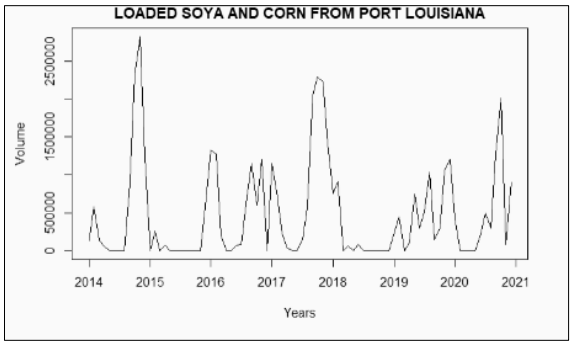

Figure 4. Soybean and Corn Exports from the Port of South Louisiana

Fixed Effects Models for The Ports Exporting Corn & Soybeans

The three ports exporting corn and soybeans were pooled together— Plaquemines Port Harbor and Terminal District, Port of Greater Baton Rouge, and Port of South Louisiana—and a fixed port effects was run. The results indicate that the Trump Administration's tariff policy led to a decline in corn and soybean exports from the ports that was not statistically significant. See Figure 5.

	Dependent variable:
	loaded
Trump	-113,474.400
	(73,367.900)
gdp_exp	55.251
	(426.029)
covid	14,590.410
	(127,568.600)
Observations	252
R2	0.017
Adjusted R2	-0.003
F Statistic	1.440 (df = 3; 246)
Note:	*p<0.1; **p<0.05; ***p<0.01

Figure 5. Fixed Effects for the 3 Ports Exporting Corn & Soybeans

Import Analysis for Steel and Aluminum in Relation to the Tariff Policy

Data for steel and aluminum imports for this analysis for the period 2014 to 2020 were obtained from the two of the five major ports of Louisiana (New Orleans and St. Bernard) that engage in

steel and aluminum imports. Multivariate time series analysis using ARIMA modelling was run, and the following results were obtained.

Steel Imports to the Port of New Orleans

In multivariate time series analysis using ARIMA modelling, the Trump Administration's tariff policy led to a decline in the import of steel at the Port of New Orleans, which is statistically significant. See Figure 6.

	Dependent variable:
	[
ar1	0.225**
	(0.103)
ar2	0.336***
	(0.106)
intercept	279,969.700
	(336,438.100)
Trump	-98,455.540**
	(39,522.170)
gdp_imp	4.905
	(146.489)
covid	-36,313.870
	(42,038.090)
month	-8,167.215***
	(1,994.882)
Observations	84
Log Likelihood	-1,035.522
sigma2	2,973,779,125.000
Akaike Inf. Crit.	2,087.044
Note:	*p<0.1; **p<0.05; ***p<0.01

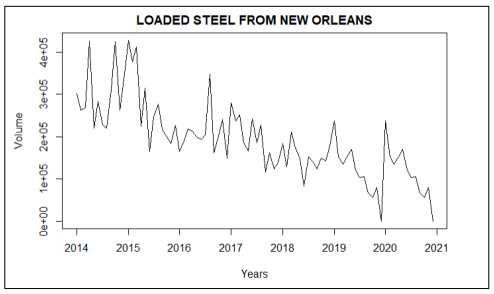

Figure 6. Steel Imports through the Port of New Orleans

Steel Imports to St. Bernard Port, Harbor and Terminal District

In multivariate time series analysis using ARIMA modelling, the Trump Administration's tariff policy led to a decline in the import of steel at St. Bernard Port, Harbor and Terminal District but it is not statistically significant. See Figure 7.

	Dependent variable:
	[
ar1	0.180*
	(0.108)
ar2	0.174
	(0.106)
ar3	0.348***
	(0.107)
intercept	310,340.400
	(206,156.100)
Trump	-15,635.850
	(23,776.920)
gdp_imp	-98.337
	(89.926)
covid	-22,216.000
	(22,505.200)
month	-1,947.215*
	(1,021.126)
Observations	84
Log Likelihood	-986.828
sigma2	929,169,081.000
Akaike Inf. Crit.	1,991.656
Note:	*p<0.1; **p<0.05; ***p<0.01

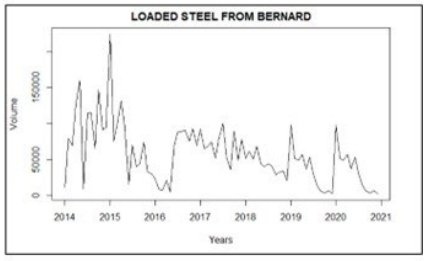

Figure 7. Steel Imports through St. Bernard Port, Harbor and Terminal District

Fixed Effects Analysis for the Two Ports Importing Steel

The two ports importing steel, New Orleans and St. Bernard, were pooled together and a fixed effects model controlling for port and month fixed effect was run. The results indicated that the Trump Administration's tariff policy led to a statistically significant decline in imports of steel through these ports. See Figure 8.

	Dependent variable:
	loaded
Trump	-10,121.810
	(6,887.732)
gdp_imp	10.028
	(27.111)
covid	3,266.433
	(8,957.461)
Observations	168
R2	0.023
Adjusted R2	-0.001
F Statistic	1.279 (df = 3; 163)
Note:	*p<0.1; **p<0.05; ***p<0.01

Figure 8. Fixed Effects Analysis for the Two Ports Importing Steel

Aluminum Imports to the Port of New Orleans

In multivariate time series analysis using ARIMA modelling, the Trump Administration's tariff policy had a negative impact on imports of aluminum to the Port of New Orleans that is not significant. See Figure 9.

	Dependent variable:
	[
ar1	0.340***
	(0.105)
ar2	0.079
	(0.117)
ar3	0.352***
	(0.105)
intercept	-94,079.300
	(165,573.800)
Trump	-30,511.990
	(21,465.170)
gdp_imp	62.306
	(71.950)
covid	23,416.220
	(20,041.900)
month	-1,417.832
	(894.532)
Observations	84
Log Likelihood	-969.264
sigma2	610,441,570.000
Akaike Inf. Crit.	1,956.529
Note:	*p<0.1; **p<0.05; ***p<0.01

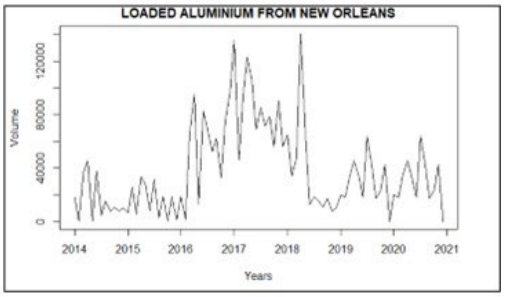

Figure 9. Aluminum Imports to the Port of New Orleans

Aluminum Imports to St. Bernard Port, Harbor and Terminal District

In multivariate time series analysis using ARIMA modelling, the Trump Administration's tariff policy led to a decline in the import of aluminum to St. Bernard Port, Harbor and Terminal District but not statistically significant. See Figure 10.

	Dependent variable:
	[
ar1	-0.048
	(0.102)
ar2	0.445***
	(0.092)
ar3	0.326***
	(0.104)
intercept	-17,246.930
	(61,345.170)
Trump	-12,231.360
	(7,821.509)
gdp_imp	14.597
	(25.851)
covid	8,110.884
	(8,592.578)
month	-328.367
	(378.186)
Observations	84
Log Likelihood	-918.323
sigma2	181,391,031.000
Akaike Inf. Crit.	1,854.646
Note:	*p<0.1; **p<0.05; ***p<0.01

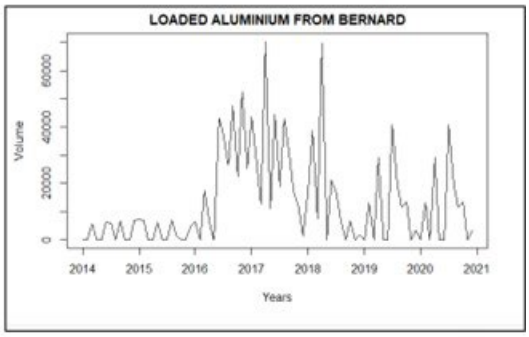

Figure 10. Aluminum Imports to St. Bernard Port

Fixed Effects Model for the Two Ports Importing Aluminum

In this analysis, St. Bernard Port, Harbor and Terminal District and the Port of New Orleans were pooled together and a fixed effects model controlling for port and month fixed effect was run. The results indicate that the Trump Administration's tariff policy led to a decline in the import of aluminum to the two ports although the decline was not statistically significant. See Figure 11.

	Dependent variable:
	loaded
Trump	-10,121.810
	(6,887.732)
gdp_imp	10.028
	(27.111)
covid	3,266.433
	(8,957.461)
Observations	168
R2	0.023
Adjusted R2	-0.001
F Statistic	1.279 (df = 3; 163)
Note:	*p<0.1; **p<0.05; ***p<0.01

Figure 11. Fixed Effects Model for the Two Ports Importing Aluminum

Input-Output Analysis: Job Numbers and Economic Productivity

Transportation & Warehousing Contributions to Percentage Change in Real GDP

The input-output analysis results for the transportation and warehousing sector contribution to GDP for the New Orleans, Baton Rouge MSA's, and the State of Louisiana are as follows.

New Orleans-Metairie Metropolitan Statistical Area

Input-output analysis of the impact of the Trump Administration tariffs shows a decrease in the contribution of the transportation and warehousing sector to the GDP within the New Orleans-Metairie metropolitan area where three major ports are located: Port of New Orleans, St. Bernard Port, Harbor and Terminal District, and Plaquemines Port Harbor and Terminal District. See Figure 12.

Baton Rouge Metropolitan Statistical Area

Input-output analysis of the impact of the Trump Administration tariffs shows a decrease in contribution of the transportation and warehousing sector to the GDP of the Baton Rouge MSA where two major ports are located: Port of South Louisiana and Port of Greater Baton Rouge. See Figure 13.

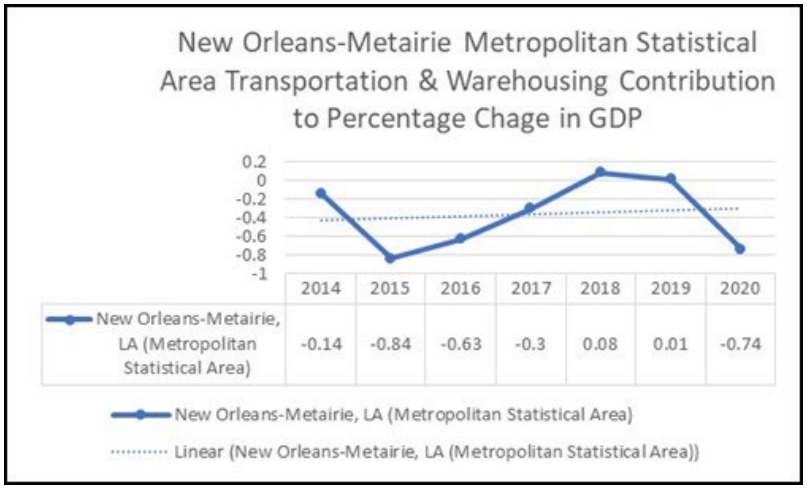

Figure 12. New Orleans-Metairie Metropolitan Statistical Area Transportation and Warehousing Contribution to Percentage Change in GDP

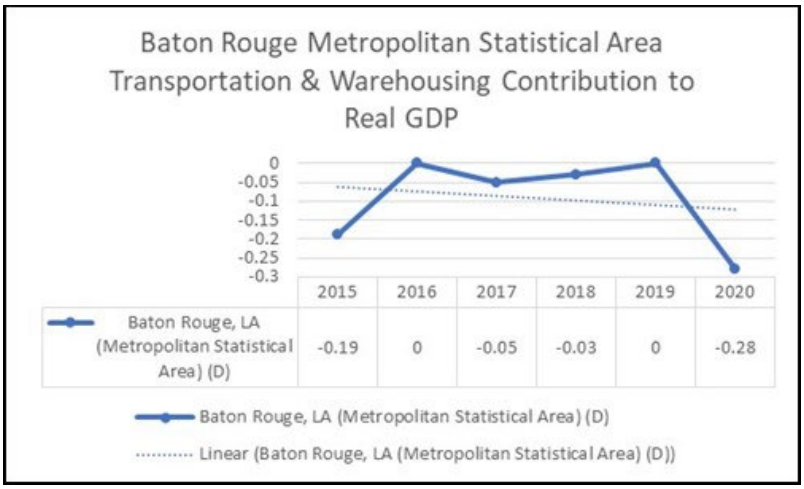

Figure 13. Baton Rouge Metropolitan Statistical Area Transportation and Warehousing Contribution to Real GDP

Louisiana Transportation & Warehousing Contribution to Real GDP

Input-output analysis of the impact of the Trump Administration tariffs shows a decrease in contribution of the transportation and warehousing sector to the GDP of the State of Louisiana from 2018 to 2020, but a gradual increase in 2021, albeit still a negative growth. See Figure 14.

Transportation & Warehousing Full & Part Time Job Trend

The input-output analysis results for the transportation and warehousing sector contribution to job numbers for the New Orleans- Metairie and Baton Rouge MSAs, and the State of Louisiana are as follows.

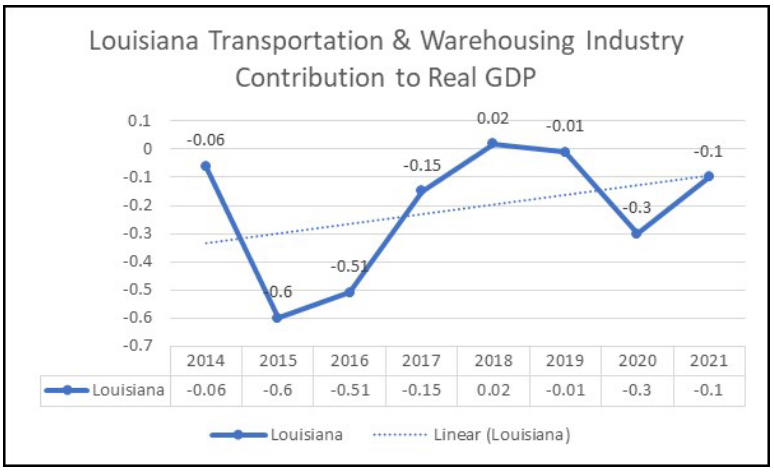

Figure 14. Louisiana Transportation & Warehousing Contribution to Real GDP

New Orleans-Metairie Metropolitan Statistical Area Job Changes

The Trump Administration tariff increases negatively affected the job numbers in the transportation and warehousing sector during 2019 to 2020 in the New Orleans- Metairie MSA. See Figure 15.

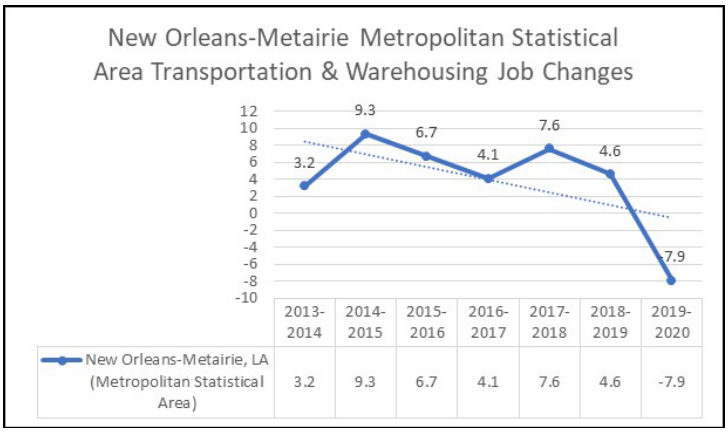

Figure 15. New Orleans-Metairie Metropolitan Statistical Area Transportation & Warehousing Job Changes

Baton Rouge Metropolitan Statistical Area Job Changes

As seen in Figure 16, there was no adequate data available to show for the changes in job numbers for the period corresponding to the implementation of the steel and aluminum tariffs. The BEA usually suppresses data in particular circumstances for the protection of confidential information of businesses that could be identifiable in an area (Bureau of Economic Analysis, 2008). Therefore, the input-out approach could not capture any significant movements for that period.

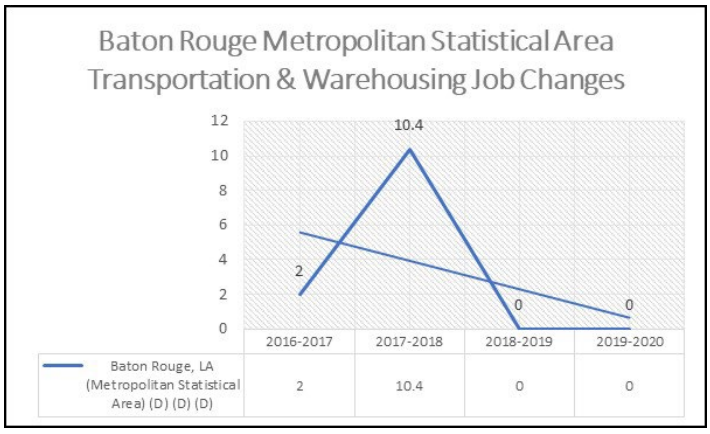

Figure 16. Baton Rouge Metropolitan Statistical Area Transportation & Warehousing Job Changes

Louisiana Transportation & Warehousing Industry Job Changes

Figure 17 shows that from 2018-2019, Trump Administration tariff increases impacted job numbers negatively within the State of Louisiana.

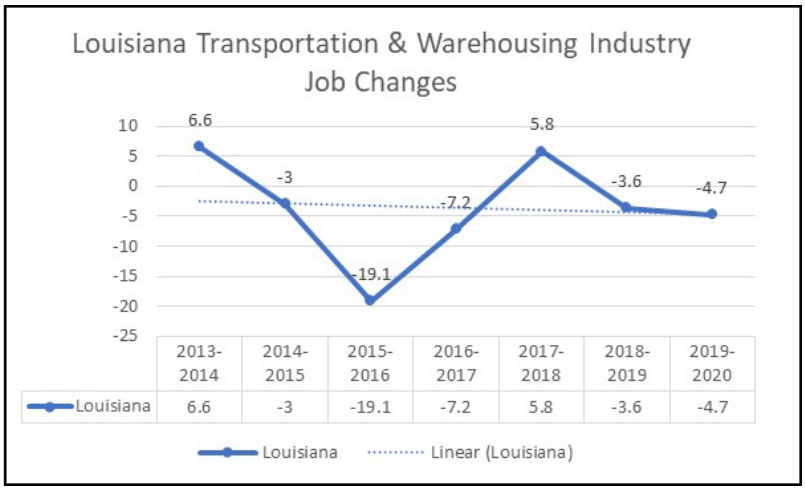

Figure 17. Louisiana Transportation & Warehousing Industry Job Changes

DISCUSSION: TRANSPORTATION. TRADE, AND TARIFFS IN THE U.S.

From the earliest days of colonization, the United States has focused on transportation to tie its huge and diverse geography together. The initial need to move people between its individual colonies and its agricultural products to coastal markets evolved as the nation's economy grew and diversified in the industrial age. Overland travel yielded to rivers and canals for the movement of bulk goods and waterways were ultimately augmented and, in many cases, superseded by railroads and highways. Today, all modes of transportation are in play and intrinsically tied to both domestic and global trade. In order to fully understand the impact of tariffs on the national economy, it is critical that the transportation-trade nexus, and the role played by the coalitions that have emerged in support of its various components, be better understood. The following section introduces a conceptual framework for the study of such coalitions and an in-depth discussion of the U.S. transportation and trade coalitions.

The Advocacy Coalition Framework: A Lens on Public Policy Making

In the early 1980s, Paul Sabatier and Hank Jenkins-Smith developed the Advocacy Coalition Framework (ACF) to overcome the limitations of the linear model of the public policy process that did not account for the dynamics of the actors involved with complex public policy problems. ACF allows for more actor connections such as those involved between different levels of government, industry and agency involvement, and lobbyist and association activities. Approaching this new framework from dissimilar perspectives both men shaped a broader perception or "…more importantly, Jenkins-Smith's work and observations of the policy process reflected the same underlying logic espoused by Sabatier, particularly in the political uses of policy analysis and normative claims, especially during different levels of conflict" (Sabatier and Weible, 2014, p. 285). Initially proposed to better understand the role that science and experts had in the lawmaking process, the ACF is described as a research approach that seeks to explain

the features that affect coalition formation, policy learning, as well as fluctuations in policy (*ibid*). This framework operates with the following underlying assumptions: studying subsystems (also known as issue networks) is an effective way to study the policy cycle; any individual or organization that recurrently tries to shape subsystem activities in any way is a subsystem actor; individuals' characteristics (belief systems) make "devil shifts[1]" possible; coalitions can be formed by organizing subsystem actors; coalitions' beliefs are carried over into policy; studying subsystems requires assessment of how beliefs and technological information align or not; adopting a long-term approach is essential (information spanning at least 10 years or more) to appropriately grasp the evolution of procedures and changes in policy since short-term studies may not accurately capture the total policy cycle (*ibid)*.

ACF's unit of analysis is the policy subsystem, which includes "legislative committees, government agencies, and interest groups" as well as "lobbyists, members of the media, members from nonprofit organizations" and others (Sabatier and Weible, 2014). They list six factors that contribute to the strength of a coalition (*ibid,* p. 155):

- skillful leadership
- mobilizable troops
- legal authority
- public opinion
- information
- financial resources

The ability of coalitions to increase the strength of these factors correlates with their success in achieving favorable policy change. These factors do not necessarily have a hierarchy and their importance can change as context changes. Coalition failures can result if these factors are lacking or ignored. Failure can also result if there is discord inside the coalition. ACF posits that coalition actors will show consensus on the policy core, even if they disagree on other aspects. However, sometimes these secondary belief disagreements can become significant enough that the groups split. Alternatively, the coalition could dissolve if they were not actually sharing a policy core but just sharing an opponent. Coalitions might also find that they, or the individuals that compose it, have multiple interests that can flux and change and weaken the unity of the coalition as a whole (*ibid*).

To evaluate the success of a policy change championed by a coalition, there is first the question of whether the policy achieved the coalition's goals, and then the question of whether the policy contributed to the "greater good." Other ways of examining the success of a policy change include whether the policy change outlasts a new administration, whether it is stable as contexts such as budgets change, and how much litigation or negative feedback results from the policy change.

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[1] A "devil shift" is defined as "…perceiving political opponents as being more powerful than in reality and also more evil than they actually are." (Sabatier, Hunter, and McLaughlin, 1987).

Furthermore, the effect on nonaligned groups should be evaluated. These nonaligned groups could be people who agree with the policy change but did not actively participate in the coalition because they lacked the resources or were enjoying the "free-rider" effect. They could be people who did not prioritize this policy interest but might have increased interest with a new policy. They could also be people who are invested in this policy but were excluded from the coalitions.

The ACF is complex and comprehensive and has proven to be a useful approach to studying many different topics from health to finance. Stich and Miller (2008) originally applied ACF to the freight transportation policy subsystem in the United States, in which the highway coalition has traditionally dominated coalitions from other transportation modes (e.g., railroads, aviation, and inland waterways). Using historical analysis and the Appalachian wood products industry as an illustrative example of the policy change toward intermodalism, Stich and Miller highlight how changes external to the dominant highway transportation subsystem forced a rethinking of the transportation governing belief systems. Their research provides support for several ACF hypotheses and substantiates its validity as a framework for studying the freight transportation policy subsystem. This research merges what Stich and Miller posit are competing transportation subsystems by mode into one coalition, buoyed by the trade coalition, a failing (yet once powerful) coalition, and was the driver of the analysis of the impact of the Trump Administration's tariffs on steel and aluminum on the Lower Mississippi River (LMR) ports presented above. Figure 18 illustrates the overlap of the two coalitions over time.

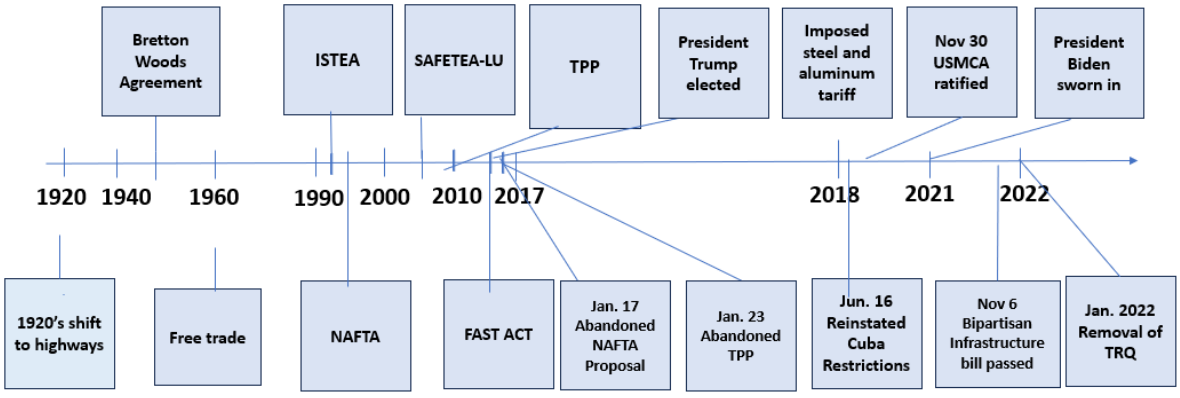

Figure 18. Advocacy Coalition/Trade and Transportation Policy Timeline

The U.S. Transportation Coalition

The core belief of the U.S. transportation coalition actors from the early 20th century until the passage of the Intermodal Surface Transportation Efficiency Act (1991) was to provide an efficient highway system that serves the interest of the domestic supply chain and the mobility of people within the country. The actors involved in the creation of the U.S. interstate highway system dubbed it the largest public works project in human history. Table 4 presents an analysis of the current status of the U.S. transportation coalition. The subsequent sections discuss how the highway transportation coalition successfully met the six critical ACF factors.

Table 4. Coalitions and Shared Beliefs

Coalitions	Shared Beliefs
Trade Coalitions (Highway era) - BPR - AASHTO - HEB - VCPA - NPBMA - NCSMA - Asphalt Institute	Build efficient highway network system nationally; Build US Highways for National Defense
External Factors - Nationalist wave - Energy Independence - Panama Canal - Trump's Trade Policy	Challenges or reinforces the coalitions beliefs: Protectionism; Energy prices; Improved technologies; Public investments
Transportation Coalitions (Intermodal era) - MARAD - USDOT - IMO - Sea Ports - NRA	Improve multi-modal coordination and efficiency

Skillful Leadership (Policy Actors)

Most notable was the skillful leadership of Thomas H. MacDonald. While "many ambitious young men saw railways as the industry of growth, not MacDonald; he determined to enter Iowa State College, to learn road building. The young man more than reached his goal: he would oversee the greatest highway program in world history" (Goddard S. B., 1994, p. 45).

The coalition assembled by MacDonald, from the road building and vehicular transportation industry, shared in MacDonald's vision that highway/road transport was not only practical, but also achievable as an alternative to railroad transportation. Attainable within this shared vision, was the expertise contributed by each entity in the development and implementation of the first-class highway system and in the formation of the United States Department of Transportation (USDOT) in 1966.

The importance of visionary leadership exemplified by individuals like MacDonald and the transformative role of entities such as the Federal Highway Administration (FHWA) in shaping the U.S. transportation landscape cannot be understated. The history of FHWA and its predecessor agencies dates to 1893 with the establishment of the Office of Road Inquiry, which later evolved into the Office of Public Roads in 1905 and eventually became the Bureau of Public Roads (BPR) in 1915 (USDOT, 2022).

Under the guidance of MacDonald, FHWA's predecessor agency BPR was actively involved in shaping the development of the U.S. highway system. As Chief Engineer (1919-1939) then Commissioner (1939-1953) of BPR, MacDonald secured authority from the Federal-

Aid Road Act of 1916 to provide federal funding and greater control over the federal-aid highway program, and the Federal Highway Act of 1921 to allow for standardized highway design and construction practices across the country (Lewis, 2013, p. 106)

In response to the economic depression of the 1930s, Congress expanded federal highway building through the Public Lands Highway Program (U.S. Department of Transportation, 2022). As a result, the establishment of a new BPR district office in Washington, D.C. in 1934 became a significant milestone in overseeing highway construction in parks, forests, and designated areas. With the expansion of resources, BPR played a crucial role in the design and construction of linear parkways throughout the United States, laying the foundation for future transportation initiatives. These projects ultimately paved the way for the construction of the transformative Interstate Highway System, formally initiated by the 1956 Federal-Aid Highway Act. Today, spanning over 48,000 miles, the Interstate Highway System accounts for a quarter of all miles driven in the U.S. (Office of Highway Policy Information, 2021).

The establishment of USDOT in 1966 brought together more than 30 agencies and functions and more than 95,000 employees – the newest cabinet-level department was also the fourth largest. Becoming one of USDOT's 10 operating administrations solidified the prominent role of FHWA in shaping transportation policy and advancing comprehensive transportation programs to this day, carrying forward the progress that MacDonald made during his leadership of BPR (Kane, 2003).

Mobilizable Troops (Coalition Actors)

MacDonald built his coalition from alliances rather than collaborating with individual companies, thus minimizing labor disputes and special preference of one company over another; a lesson he learned from the failing railroad coalition (Stich and Miller, 2008). Once the first mass-produced automobile, the Model T, was introduced by Henry Ford in 1908, average Americans gained a stake in smooth roads. To further the reach of the highway lobby, MacDonald established the Highway Education Board (HEB) to "overcome resistance to highway building by teaching Americans the value and importance of good roads" through "booklets and, later, films disseminated to schools around the country" (Lewis, 2013, p. 13). Through this programming, the sense of the average citizen as a stakeholder in good road projects would be solidified, and the American public, "with the generous assistance of engineers, public officials, manufacturers, and truckers," could compel their representatives in Congress to push forward legislation more favorable to road and highway interest at the expense of modes such as mass transit and rail (*ibid*, p. 260).

MacDonald managed to further capitalize on Ford's advancements in gathering the manufacturers of automotive products and folded them into the transportation coalition. Collaborations through public-private partnerships created a national policy for highway construction, which placed the railroad industry behind other forms of motorized transportation, especially transport trucks carrying commodities. As Goddard (1994) describes,

> The public-private partnership MacDonald had nurtured had created a national policy to further ends of one industry over another. Railroads—the nation's first big business—had become the

> archenemy of the federal and state governments three decades earlier. And now, they could only watch in awe as Washington and Detroit developed a symbiosis so strong that where one left off and the other began had blurred (p. 114).

Legal Authority

While he needed the help of the United States Government with approval and funding, MacDonald also had to be concerned with state and local governments since the highway system would impact communities within their jurisdictions. After Congress agreed to let individual states have some autonomy, MacDonald, "believed in a guiding hand from Washington but realized shrewdly that letting the states decide where roads should go would give the program stronger political legs then it would have as a national program" (Goddard , 1997, p. 36).

President Woodrow Wilson, a Democrat, signed the Federal Aid Road Act in 1916 (FARA). Coining the phrase “Good Roads,” Wilson made road and highway modernization a priority in his campaign platform understanding the necessity to modernize the country's infrastructure as its economy flourished (Weingroff, 1996). Wilson stated, “The happiness, comfort, and prosperity of rural life, and the development of the city, are alike conserved by the construction of public highways. We, therefore, favor national aid in the construction of post roads and roads for like purposes” (*ibid,* p. 124). Other legislation covered matters such as the “improvement of any rural road over which the U.S. mail was carried” and legislation requiring, “...states must have a highway department capable of designing, constructing and maintaining designated roads in order to share in the appropriation” (*ibid,* p. 124).

President Dwight D. Eisenhower, a Republican, was the primary architect of the Federal Highway Act of 1956, known more commonly as the National System of Interstate and Defense Highways. Among his motives to push for better transportation infrastructure was national defense. Eisenhower desired an interstate system that was wartime capable in the event the United States needed to defend her soil from foreign invasion. MacDonald’s coalition thrived through both administrative and federalist policy changes.

Public Opinion

Actors known as Good-Roads Advocates argued that poor roads forced all farmers to pay an unwarranted mud tax. This hypothetical tax was not an actual assessment levied by the government but instead reformers' calculations that the costs of hauling heavy farm products over improved roads were 60% lower than transporting the same goods over typical unimproved rural roads (Wells, 2006, p. 152).

Like a premiere sales representative of his time, MacDonald's push for public stakeholders in this project allowed him to thwart off most opposition to his plan, particularly from the railroad industry. He adopted a mantra for his campaign. Use of public roads, he said, is an inalienable human right, as opposed to the use of the private rails, which is a privilege based on a fare. Therefore, “the open road is symbolic of freedom” (Goddard, 1997, p. 36).

Information

The standards created for the new highway system provided a blueprint across the nation, which also reflected upon labor and materials. MacDonald, as head of the BPR, realized that even

though the state would participate in the building effort, a competent workforce would be needed to carry this mission forward. “Federal engineers believed that reliance upon untrained local officials to build and maintain roads was the central handicap facing highway improvement efforts in the United States” (Seely, 1984, p. 55). Therefore, the American Association of State Highway Officials (AASHO) was formed to work with the BPR to consolidate transportation standards. At the same time, MacDonald added several different building entities to the burgeoning coalition to support these new engineers; for example, the “Vitrified Clay Products Association, the National Paving Brick Manufacturers’ Association, the National Crushed Stone Manufacturers Association, and the makers of metal culverts” (*ibid*, p. 68) were all added to the transportation coalition and were instrumental in developing the standards endorsed by AASHO (later American Association of State Highway and Transportation Officials) and required by BPR (later U.S. Department of Transportation).

Financial Resources

Strengthening the transportation coalition is the availability of financial resources and the political will to provide funding for transportation projects around the country. FARA was the first federal highway funding legislation in the U.S. The Act, which was introduced by Rep. Dorsey Shackleford (D), then amended by Rep. J. Bankhead (D) of Alabama, provided $75 million of federal funding in 50-50 matching funds to the states (Weingroff, 1996). President Woodrow Wilson signed FARA on July 11, 1916 at a ceremony attended by AASHO, the American Automobile Association, and various farm organizations. FARA has evolved through many reenactments from 1916 through 1987. In 1956, President Eisenhower signed the National Interstate and Defense Highway Act (NIDHA), which contains an authorization of $25 billion, handled in a Highway Trust Fund (HTF), and dedicated for the construction of 41,000 miles of the interstate system (Weingroff, 1996). HTF receives money from the federal fuel tax of 18.4 cents per gallon of gasoline and 24.4 cents per gallon of diesel fuel and related excise duties (USEIA, 2023a). The HTF consists of the Highway Account which finances surface transportation infrastructure, and the Mass Transit Account, which funds mass transit projects.

The Highway Revenue Act of 1982 was passed during a recession to complement funding for the Surface Transportation Assistance Act (STAA) during the Reagan Administration. The legislation temporarily increased the Federal gasoline tax from four cents to nine cents through 1988. The STAA dedicated four cents to restoring interstate highways and bridges, while one cent for public transit. The Surface Transportation and Uniform Relocation Assistance Act of 1987 (STURAA) authorized the Secretary of Transportation to appropriate funds (ibid).

The financial narrative for highway development continued beyond 1987 with subsequent policies such as ISTEA, TEA-21, SAFETEA-LU, MAP-21, the FAST Act and the BIL which were operationalized in the preceding decades and now have increased budgets. See Table 5. However, it was not just the budgets that were increasing; the scope of the legislation did as well. Up to this point, most transportation infrastructures in the U.S. were primarily public investments, with the federal government traditionally providing 80% of funding for qualified highway construction with match funding provided by states or local governments. While the coalition was still able to command sizable resources for roads, the other modes were also demanding federal funds and trade corridors were commanding their own attention. While TEA-

21 and SAFETEA-LU stuck to the more traditional transportation funding models, ISTEA, the FAST Act and the BIL did not.

Table 5. Transportation Policy Timeline

Policy	Year	Budget	Period
FAHA	1916	$75 million	1916-1987
NIDHA	1956	$25 billion	1956-1960's
STAA	1982	$25 billion	1984-1990
STURAA	1987	$77.4 billion	1987-1991
ISTEA	1991	$155 billion	1992-1997
NHSDA	1995	$5.4 billion	1996-1997
TEA-21	1998	$198 billion	1998-2003
SAFETEA-LU	2005	$244.1 billion	2005-2009
MAP-21	2012	$105 billion	2013-2014
FAST Act	2015	$305 billion	2016-2020
Infrastructure Investment and Jobs Act (BIL)	2021	$550 billion	2022-2026

In an effort to support the development of efficient transportation systems, the Transportation Equity Act for the 21st Century (TEA-21) was enacted by Congress and authorized by President Clinton, a Democrat in 1998. TEA-21 authorized federal surface transportation programs for highways, highway safety, and transit for the six-year period 1998-2003. Because Congress could not agree on funding levels, the Act, which had continued past 2003 by means of temporary extensions, was allowed to lapse.

Subsequently, the George Bush (a Republican) Administration enacted the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users in 2005. The $244.1 billion measure contained a host of provisions and earmarks intended to improve and maintain the surface transportation infrastructure in the U.S., including the interstate highway system, transit systems, bicycling and pedestrian facilities, and freight rail operations (Office of Legislation and Intergovernmental Affairs, 2005). This was the first legislation that required USDOT and the states to account specifically for freight operations. Congress renewed its funding formulas 10 times after its expiration date, until replacing the bill with Moving Ahead for Progress in the 21st Century (MAP-21) Act in 2012.

Policy Subsystem Changes: Transportation

In 1922, President Warren Harding encouraged MacDonald and his associates to "integrate rail, road, and sea into one interdependent system, rather than planning for roads alone in a vacuum" (Goddard S. B., 1994, p. 112). However, it was not until the passage of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) that the coalition relented and allowed for such an outcome. Not only did ISTEA shift the dominant east-west axis, which was the coalition's core belief regarding highway priorities since the passage of FARA, but also was designed to support the multilateral regional trade agreement, NAFTA (Bradbury, 2002).

> The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) contained a provision that specifically identified the need to create an efficient north-south transportation system. ISTEA also provided further funding for studies on borders congestion, including a Federal Highway Administration assessment of border crossing and the transportation corridors that lead to them. As a result, 21 "trilateral corridors" were identified as being of the highest priority and a number of studies have identified infrastructure and operational deficiencies near the U.S. borders with Canada and Mexico (Bradbury, 2002, p. 144).

Trading partners rely on each country's transportation and distribution services that operate independently and lack interconnectivity among each other's logistical channels: the result being increased transborder congestion where 60–80% of goods are transported by truck (Gerald, 2014). According to Milner (1995), the success of NAFTA and the resulting transportation problems clearly illustrates the failure to consider trade's impact on an integrated North American transportation system; NAFTA was written as a trade policy with no adjustment provisions for the resulting impacts on other related policy areas such as transportation. However, recent proposed developments in transportation infrastructure investments are giving more emphasis on the design and development of cross-border access.

Hall and Jacobs, (2012) argue that MAP-21 was passed by Congress to give priority funding to 'high priority' trade corridors (the NAFTA superhighway), and to make it easier to hand them over to private multi-national corporations using controversial public-private partnership (P3) contract arrangements that promote and enhance the tolling of America at the taxpayer's expense. However, MAP-21 received overwhelming support from the House and Senate, with only 52 Republican members, and 19 Republican Senators opposing the bill (ibid). See Figure 19.

In 2015. President Obama signed into law the Fixing America's Surface Transportation (FAST) Act which was directed towards funding surface transportation programs including highways, bridges, bicycling paths, and walkways at over $305 billion for fiscal years 2016 through 2020. This policy also focused on supporting America's domestic freight transportation network.

During the Trump Administration, infrastructure investment was directed primarily toward the use of P3s. The core of his infrastructure plan relied almost entirely on private equity (backed with an 82% tax credit on private equity investments in infrastructure, the cost of which was assumed to be fully offset by overseas corporate income repatriation) (Slyke, 2017). This was a major departure from the former transportation coalition's norms, challenging their core belief that transportation is a public good that should be publicly financed. Oregon Congressman Peter DeFazio, a Democrat, stated, "this fake proposal will not address serious infrastructure needs facing this country, so our potholed roads will get worse, our bridges and transit systems will become more dangerous, and our tolls become higher" (Jansen, 2018). Unable to get enough political support for this radical shift from traditional transportation financing, the FAST Act was not replaced until November 2021 when President Biden signed the Infrastructure Investment and Jobs Act. This act, commonly known as the Bipartisan Infrastructure Law (BIL), provides

Figure 19. NAFTA Trade Corridors

Source: (Hall and Jacobs, 2012)

$550 billion between 2022-2026 for infrastructure investments in roads, bridges, water infrastructure, broadband, resilience, and mass transit. The BIL continued to address cross-border issues associated with USMCA (previously NAFTA) with the inclusion of the Ports to Plains Corridor which provides truckers with less congested routes for transborder trade (Fletcher, 2023). This is seen in President Biden's interstate designation for the New Mexico-to-Texas freight corridor on March 15, 2022, which improves freight routes from the country's busiest inland port at Laredo, Texas, all the way to Minneapolis, Minnesota.

BIL is the first U.S. infrastructure law to acknowledge the climate crisis (U.S. Department of Transportation Office of Public Affairs, 2022). Its goal is to invest in infrastructure to reduce greenhouse emissions from America's transportation network, while also bolstering the resilience of America's transportation infrastructure in the face of ever-increasing extreme weather and other climate impacts (*ibid*). Since 2021, at least 35,000 projects have been awarded funding under this new legislation from across all 50 states (White House, 2023).

Additionally, the Inflation Reduction Act (IRA) of 2022 expands upon the climate goals of the BIL and is currently the largest climate investment in the nation's history. In addition to creating clean energy jobs and manufacturing opportunities, the IRA focuses on improving electric vehicle charging infrastructures and access to electric vehicles (USDOT, 2023a.)

The U.S. Trade Coalition

In the aftermath of World War II, the United States and its allies charted a new route to global economic cooperation through the Bretton Woods Agreement (U.S. Treasury, 1944) ratified in 1944 and endorsed by 730 delegates from all 44 Allied nations. The agreement established the International Monetary Fund (IMF) and the International Bank for Reconstruction and Development (IBRD), presently the World Bank, to provide banking services for this new economic system (Chen, 2022). The U.S. held considerable influence in these two institutions that set the terms of development in countries around the world, thereby institutionalizing its 'free trade' political agenda (Griffith, 2016). Later in the same year, the General Agreement on Trade and Tariffs (GATT) was ratified, which was subsequently replaced by the World Trade Organization (WTO) formed by the Marrakesh Agreement in 1994. The WTO agreement was signed by 123 nations and is the international trade regulating body. This was economic world order created and traditionally promoted by the U.S. and was the basic underlying norm through subsequent administrations. Table 6 summarizes the shared beliefs of the trade coalitions.

Table 6. Trade Coalitions and Shared Beliefs

Coalitions	Shared Beliefs
Trade Coalitions (Revenue Era) - Democratic U.S. Congress	Raise national revenue
Trade Coalitions (Restriction Era) - Republican U.S. Congress	Protectionist; restrict international trade
Trade Coalitions (Reciprocity era) - U.S. Presidents - U.S. Congress - USITC - USTR - WTO - IMF - The World Bank	Trade agreements; Trade negotiations; Trade investigations; Multilateral financing; Trade facilitation and rule enforcements
External Factors - Nationalist wave - Energy Independence - Panama Canal - Trump's Trade Policy - Corona Virus - Ukraine- Russia War	Challenges or reinforces the coalitions beliefs: Protectionism; Energy prices; Improved infrastructure; trade restrictions; supply chain disruptions

The following sections discuss how the reciprocity trade coalition applied the six ACF factors.

Skilled Leadership (Policy Actors)

U.S. Presidents, influenced by their political beliefs and convictions, have been instrumental in driving trade policies. This can be seen through three eras of international trade policymaking where the most dominant political party implements the most favorable policies considering their political bases (Irwin, 2019). However, the constitutional authority to make trade policies actually rests with the U.S. Congress. From 1790 until the 1930s, Congress passed international trade legislation and set tariff rates. This changed in 1934 when the U.S. Congress began ceding tariff-setting power to the President. Nevertheless, Congress still votes occasionally on whether to grant such negotiating authority to the President (Blonigen, 2011). Table 7 shows the three eras of trade leadership: Democrats dominated U.S. politics from 1837 to 1860, supporting liberal trade policies, while opposing protective tariffs in order to support the export-oriented economy of the U.S.' southern states. Republicans succeeded in raising tariffs in 1862, but Democrats brought them down in 1866 after they took control of the government. During the period between 1934 to 1993, Democrats dominated U.S. politics and supported reciprocal trade agreements that reduced tariffs (Irwin, 2019). During the ensuing 30 years, the South and North have flipped party dominations, which resulted in stabilizing trade policy thrusts (Kuziemko and Washington, 2018).

Table 7. Three Eras of U.S. Trade Policy

Period	Trade Policy Objective	Congressional Voting	Dominant Political Party	Region Represented
1837-1860	Revenue	Tariff Schedule	Democrats	South
1861-1933	Restriction	Tariff Schedule	Republicans	North
1934-1993	Reciprocity	Negotiating Authority & Trade Agreements	Democrats	Mixed

Source: (Irwin, 2019)

The Republican party began to support the ideals of GATT following World War II as Europe and Asia (especially Japan) were no longer serious competitors to the U.S. market as a result of the War's economic devastation (Irwin and Kroszner, 1999). To help the Allied nations prop up their economies, a bipartisan consensus was reached that free trade would be beneficial to the U.S. and its foreign policy (Bailey, 2011). Irwin (2019) argues that political and economic forces from the U.S. Civil War, the Great Depression, and World War II led to a political alignment within the U.S. that altered power between the contending political parties and regions and brought about consensual support for trade liberalization. Nonetheless, even in the years after the ratification of the Bretton Woods agreement, the U.S., from time to time, has implemented protectionist trade policies. The post-World War II era saw the prosperity of American industries grow tremendously until the 1970s when stiff competition from low-cost producers around the

world challenged U.S. dominance (Barton, Goldstein, Josling, and Steinberg, 2008). Over time, changing political leadership has decided what policies best suit a particular industry depending on what they produce in relationship to competition from foreign countries (Sousa, 1982).

Mobilizable Troops (Coalition Actors)

The U.S. became the convener of the world economic order following WWII because of its economic and military strength (Zeihan, 2014). Beyond opening its borders to international trade, the U.S. also offered its unparalleled navy to protect shipping lanes around the globe, with no imperial taxes imposed, but as a partnership with Allied nations.

> From the Versailles peace, they knew intimately how deeply indebted nations became radicalized. They knew that the attempts to reinstall the gold standard, which had ended in 1914, had bred international financial instability through the 1920s. They knew the fascist infection strengthened on economic insecurities, and the global depression which engulfed the 1930s made aggressive militarism an attractive and effective pathway to solve economic problems like unemployment and lack of natural resources. Now, in the crux of escalating war, they were there to break the vicious cycle (Huxen, 2019).

By the end of the Cold War, most parts of the world had joined the new global system. The rise of Japan as a global economic powerhouse, the Korean miracle, and the recent burgeoning of the Chinese economy are products of free trade policies.

Legal Authority

In a bid to manage trade between the U.S. and other parts of the world, the American government has implemented trade agreements or trade restrictions in the form of tariffs, quotas, and total embargos. Fletcher (2010) established that there was a general lessening of protectionist measures from the 1930s onwards, which culminated in the free trade period that followed the ratification of the Bretton Woods Agreement. Similarly, GATT which evolved to become the World Trade Organization (WTO), has led to various forms of global collaboration. Free Trade Agreements (FTA) could be bilateral, (between two nations); multilateral, (between several nations); or regional, which is basically between two or more countries within the same geographical region. America's major objective in entering into FTAs is reducing barriers to U.S. exports, protecting U.S. interests while competing internationally, and improving the rule of law in the FTA partner country or countries (International Trade Administration, 2023) Today, the U.S. has 15 FTAs with 21 countries and was the core player for the admission of China into the WTO (Office of the United States Trade Representative, 2023). Table 8 shows a timeline of free trade agreement implementation by the U.S. and partner countries.

Table 8. U.S. Free Trade Agreements (FTA)

Trade Policy	Partner Countries	Timeline
Israel FTA	Israel	1985
Jordan FTA	Jordan	2001
Chile FTA	Chile	2004
Singapore FTA	Singapore	2004
U.S.- Bahrain Bilateral Investment Treaty	Bahrain	2004
Australia- U.S. FTA	Australia	2005
Morocco FTA	Morocco	2006
U.S- Colombia Trade Promotion Agreement	Colombia	2006
Oman FTA	Oman	2009
U.S- Peru Trade Promotion Agreement	Peru	2009
Dominican Republic- Central America FTA (CAFTA- DR)	Costa Rica, El-Salvador, Guatemala, Honduras, Nicaragua, and Dominican Republic	2009
U.S-Panama Trade Promotion Agreement	Panama	2012
Korea-US FTA (KORUS)	South Korea	2012
U.S.- Japan FTA (Critical Minerals)	Japan	2021
NAFTA/USMCA Trade Agreement	Canada and Mexico	1994/2020

Source: (OUSTR, 2021)

However, the U.S. has implemented tariff regimes on a variety of commodities that restricted free trade, even in the post-Bretton Woods period. Table 9 shows recent protective trade policies that were implemented by different administrations cutting across the two political parties. However, Irwin (2019) argues that historically, the overall impact of international trade on the U.S. economy has been insignificant because of the enormous size of the U.S. economy. He establishes that the exceptional periods were before 1820 and after 1980 when the share of trade was significantly higher.

Table 9. Post-Bretton Woods Era Tariffs Implemented by the U.S.

Tariff	Date
Jimmy Carter's Shoe Quota's	1977
Ronald Reagan's Motorcycle tariffs	1983
George W. Bush Steel Tariffs	2002
Chinese tires tariffs	2009
Donald Trump's Steel & Aluminum Tariffs and others	2018
Joe Biden's Aluminum Duties on the UAE	2021

Source: (OUSTR, 2021)

Public Opinion

International trade policies in the U.S. can be very contentious depending on whom is asked; therefore, opinions of stakeholders substantially impact the policies. Public hearings for major stakeholders, mostly domestic producers, are a core aspect of the process of international trade policy negotiations. For instance, businesses could benefit from a tariff-driven trade policy in a way that the increased tariff helps their business thrive domestically. Conversely, a tariff increase could hurt a U.S. domestic business by increasing their cost of doing business, especially if they rely on imports that are tariffed for raw materials in their industries. In such cases, the United States International Trade Commission (USITC), an independent, nonpartisan, quasi-judicial federal agency adjudicates and proffers technical and legal solutions to the problems (USITC, 2023). USITC usually organizes hearings, inviting concerned stakeholders to discuss issues surrounding trade disputes and injuries created by unfair competition or dumping. The U.S. Trade Representative (USTR) office participates actively in these processes. The USTR is part of the Executive Office of the President, responsible for developing and coordinating U.S. international trade, commodity, and direct investment policy, and overseeing negotiations with other countries (OUSTR, 2023). At the onset of the renegotiations of NAFTA, the Trump Administration held dozens of meetings to solicit advice and input, while the USTR sought public comments and received more than 12,000 responses. After this, it held a three-day public hearing on the renegotiations, hearing from more than 140 witnesses, who provided testimony on a wide range of sectors, including agriculture, manufacturing, services, and digital trade (OUSTR, 2017).

Similarly, in 2021, the Biden Administration's U.S. Trade Representative Katherine Tai indicated that the Trump era tariffs on China would remain, but that the Administration would restart an "exclusion" process that would provide succor to some U.S. companies that were directly impacted by the tariffs (Khalid, 2021). Exclusion is a process by which stakeholders request the removal of a product from items covered under a particular form of tariff, through the United States Trade Representative (USTR). The Biden Administration has already started processing requests from stakeholders (OUSTR, 2021). The exclusion process was also a result of stakeholder hearings that were organized to collect relevant information on the impacts of the Trump Administration's tariff policy. All technical findings from such hearings are submitted to the President and the Congress for further action.

Regardless, the Chicago Council Survey data show that international trade has enjoyed consistent bipartisan support from a majority of Americans during the past 20 years. In 2021, three in four (75%) Americans thought that international trade was good for the U.S. economy. The public has also expressed support for free trade agreements: majorities across all parties supported U.S. membership in the U.S.-Mexico-Canada Free Trade Agreement and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership. See Figure 20.

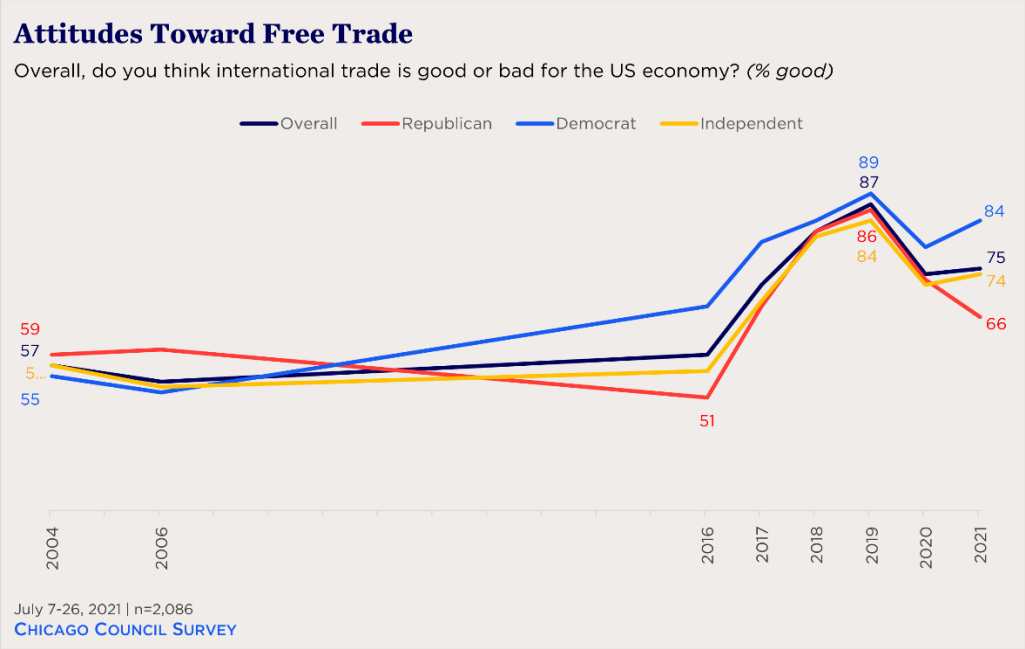

Figure 20. American Views on International Trade

Information

The Office of the U.S. Trade Representative and that of the USITC play a key role in information gathering and dissemination. For example, President Trump adopted Twitter to make major policy announcements. Irwin (2019) contended that judging from his tweets, President Trump's international trade policy objectives are geared towards achieving all three objectives of revenue, restriction, and reciprocity. Traditionally, coalition leadership relied on their members to provide "the free trade is good for the economy" message. These include economic development agencies (local, state and federal), chambers of commerce (local, state and federal), and the World Trade Center (regional, federal). Strong industrial ties to successful global firms also played a significant role as message bearers.

Financial Resources

Spero and Hart (1985) described the role of the U.S. as that of a global policymaker, world central banker, and producer of goods and services. To this end, the U.S. Office of International Trade's Small Business Administration (SBA) supports the development of small business exports. Through U.S. Export Assistance Centers, SBA district offices and a variety of service-provider partners, SBA directs and coordinates ongoing export initiatives in an effort to encourage small businesses to go global. This entails the prioritization of free trade through stable fixed exchange rates, and the protection of autonomous policies of individual nations. Additionally, U.S. banks or other financial institutions use a variety of tools like bank guarantees and/or letters of credit designed to support importers and exporters to carry out commercial transactions.

However, more recently,

> The Biden Administration has pursued an extensive industrial policy agenda, including industrial subsidies and protectionist trade measures, aiming to improve American competitiveness, deepen supply chain resilience, and revitalize domestic manufacturing. The 2022 National Security Strategy, for instance, states that "strategic public investment is the backbone of a strong industrial and innovation base in the 21st century global economy." To that end, the administration has championed the CHIPS and Science Act, Inflation Reduction Act (IRA), and Infrastructure Investment and Jobs Act (IIJA), collectively sending hundreds of billions of dollars to strategically important industries (Meng, 2023).

Policy Subsystem Changes: Trade

Although America's gradual withdrawal from the global system has only recently been highlighted in the policy literature, the U.S., the major propagator of liberal trade, has found itself restricting trade through implementing protectionist policies at various stages of its history. Historical data show that the U.S. import tariffs have been a central focus of U.S. trade policy since the establishment of the federal government in 1789 (Autor, Dorn, and Hanson, 2016). Irwin (2019) establishes that import tariffs are implemented to raise revenue for the federal government, to restrict imports and protect domestic producers from foreign competition, and to achieve reciprocity through agreements that reduce trade barriers. They are called the "three Rs" of trade policy: revenue, restriction, and reciprocity, which he established that all or any of the three can be implemented at any point in time (ibid, p. 29). Bailey (2011) classifies the periods of U.S. trade policy into three eras, and at each era one of the three Rs was dominant:

> 1. From 1790 to 1860: revenue considerations were more important because import tariffs raised 90% of federal government revenues.
> 2. From 1861 to 1933: as government revenues from taxes became dominant, import tariffs were directed to protect domestic industries from competition.
> 3. From 1934 to 2016: the most important part of trade policy in this era was to reach agreements with other nations; multilaterally through GATT and WTO, regionally as seen in the North American Free Trade Agreement (NAFTA), now the U.S.-Mexico-Canada Trade Agreement (USMCA), or bilaterally with countries such as Korea, Singapore, Australia, and others. Irwin (2019) argues that President Trump's tariffs hikes were geared towards achieving all three Rs of trade, judging from his tweets.

According to Irwin (2019), there has been an interesting international trade dynamic in the three eras of trade; first, there was a 20% to 60% rise in tariffs between 1790 to 1860, which subsequently slows down to 20%. While in the second era, the period between 1861 to 1933, the average tariff rose by 50%, staying at that level for many decades. Finally, from 1934 to the present, the period of reciprocity, the average tariff fell significantly, then stabilized at 5%. Irwin (2019) indicated that there was only a slight increase in this rate because of the Trump Administration's tariff hikes on China and the imports of steel and aluminum. He also emphasized that although the average tariff on dutiable goods has significantly fluctuated during

the years under review, the tariff rates implemented by policymakers have been much more stable. Events like World War I and the Great Depression of the 1930s led to a rise in prices and increasing tariffs. But there were tariff reductions between 1944 to 1950, from 33% to 12%, with one-third of the decrease coming because of negotiations at the GATT conference in 1947 (*ibid*).

However, beginning with the Trump Administration, a fourth new era of illiberal trade policies is now in effect. President Trump consistently disparaged NAFTA as bad for the U.S. economy and forced a renegotiation into what became the USMCA in 2018 (Swanson, 2020). The President's main reason was the widening bilateral trade deficits with the trade partners. The President also imposed higher trade tariffs on other American trading partners. In addition to the 25% increase on steel imports and 10% on aluminum, a 20% increase was imposed on German cars as well as other increases on various commodities from various nations. Larry Gross also says increased tariffs on Chinese-made consumer goods have a negative impact on international intermodal traffic and the bigger worry is the Chinese retaliation against U.S. agricultural products. According to the USDA, China is the largest importer of American farm products, from soybeans and grain to pork and cotton. The export of American agricultural products to China grew 219% during the past decade and is now worth about $21.4 billion. The Association of American Railroads (AAR) established that more than a third of the industry's revenue is directly tied to trade, while more than 40% of rail traffic is related to imports or exports. The AAR maintains that "While agreements can always be improved and must put domestic workers first, lawmakers should not promote policies that would unwittingly roll back U.S. participation in international trade" (Stephens, 2018).

Unlike the coalitions of the past, which were comprised of entities affiliated with the Chamber of Commerce, the GOP, and other groups working in the interest of a more traditional framework to advance the trade agenda, under President Trump, a different coalition framework emerged particularly in the energy sector. According to Amy Harder (2018), an analyst on energy and U.S. trade issues, a group of informal coalitions has formed in the wake of the President Trump's administration. She indicates that,

> Informal coalitions are popping up under Trump more than they have in the past, according to veteran Washington consultants and newly compiled federal lobbying data. These groups are mostly separate from the familiar, entrenched trade groups that traditionally run Washington's lobbying and public relations machine,

Harder reveals that since President Trump took office, there have been at least ten new informal coalitions that have formed, which appear to be pro-coal and nuclear power production (Harder, 2018). Harder also indicates that there are some benefits to informal alliances, such as,

> They're more flexible and can be temporary. The tariffs group only needed to exist while Trump was considering whether to impose them for example:
>
> - They can work on issues that split trade associations. That's happening more as traditional groups seek to grow and broaden their membership.
> - Industry-splitting issues, ranging from ethanol to trade, are also coming up more under Trump, whose policies and procedures are upending decades' worth of traditional Washington maneuvering.

- For all of those reasons, they're a money-maker for PR and lobbying firms (Harder, 2018)

Based on the changing dynamics of the U.S. trade policies, more informal coalitions will assemble which should include the transportation coalition.

China is the second largest economy in the world after the U.S. The Congressional Research Service (2022) reported that China exports to the U.S. three times the value of what it imports from the U.S. The report concludes that "in 2021, China was the fourth-largest U.S. goods trading partner (with a total trade of $657.4 billion), the fourth-largest U.S. export market (at $151.1 billion), and fourth largest source of U.S. imports (at $506.4 billion), when the European Union (EU) is considered as one trading partner." The U.S. has imposed tariffs on $250 billion worth of Chinese imports, and China has retaliated by raising tariffs on U.S. exports, including soybeans and corn, which are some of the commodities of focus for this research (Meltzer and Shenai, 2019). These "trade wars" have the potential to disrupt the productivity of both economies. For instance, the U.S.- China Business Council has established that the U.S.-China trade relationship supports roughly 2.6 million jobs in the U.S. (Oxford Economics, 2017).

Global trade has been managed through the ratification of trade agreements between nations in a move to encourage free trade among partner nations. Similarly, nations have imposed trade sanctions in the form of higher tariffs or trade quotas which are restrictive to global free trade. However, there are divergent views on the impacts of such tariff hikes by both stakeholders and researchers. While some parties and stakeholders discourage protectionism, others are pro-trade. The Trump administration maintained that tariff hikes are necessary for protecting domestic production, U.S. economic growth, and are a crucial element in trade negotiation. Former U.S. Secretary of Treasury Steven Mnuchin contended that the 3.2% expansion in the economy in the first quarter of 2019 was because of improved U.S. exports. He says, "There's no question that some of the trade policies helped in the GDP number." (Tankerslay, 2019).

Table 10 shows a timeline of President Trump's implemented tariff regimes and retaliations from trade partner nations. The table also shows few adjustments on the policies that were implemented by President Biden's administration. President Biden has carried on most of President Trump's trade policies albeit with a few changes seen in February 2021 and January 2022.

EXTERNAL FACTORS AFFECTING THE TRANSPORTATION AND TRADE COALITIONS

A key facet of global trade is efficient transportation systems; As Williamson (1998) notes, globalization was only possible because of improved world transportation systems. Former Secretary U.S. Department of Treasury, Lawrence H. Summers, described transportation in his speech at the International Transportation Symposium, 2010, as "the industry that connects other industries. … it is the key to globalization" (USDOT, 2000, p. 179). Additionally, since 1991,

trade corridors have been specifically included in federal (and some state) transportation legislation.

Nationalist Wave

As discussed, the Trump Administration's international trade policies were isolationist and a departure from core American tenets of trade liberalization. However, the emergence of nationalist policies is not unique to the U.S. For instance, the Brexit vote in the United Kingdom, a product of English nationalism, was a significant departure from the preceding status quo of European integration (O'Toole, 2016). The unexpected decision for the U.K. to leave the European Union triggered substantial shifts in economic activity, leading to a reduction in GDP, even before the formal policy changes associated with Brexit took effect (Born, Müller, Schularick, and Sedláček, 2019). It is worth noting that these shifts occurred not because of an explicit change in trade policy but because of a national referendum that reflected the country's changing sentiment towards globalization and economic integration. These international instances of anti-globalization movements add an additional layer of complexity to the study and understanding of global trade dynamics (O'Toole, 2016) (Born, Müller, Schularick, and Sedláček, 2019). Similar sentiments can be found in Germany with the AfD, Spain with Vox, France and the National Rally, the Netherlands and Austria both have the Freedom Party, and Italy with The League.

Energy Importer to Energy Exporter

The United States shifted from a major energy importer to a major energy exporter due to the emergence of shale oil and gas production via hydraulic fracturing, popularly called fracking. This move has altered the balance of the global oil and gas supply chain and had a significant effect on prices. The Energy Information Administration (EIA) puts American shale oil output at 2.84 billion barrels or about 7.79 million bpd in 2022 (USEIA, 2023b). America became the largest producer of energy in 2014, surpassing Saudi Arabia and Russia, and improved fracking technology has led to much more efficient production, thus higher yields at lower cost (Economic Times, 2015). In 2022, the U.S. remained the largest oil producer in the world, accounting for 14.5% of crude oil production worldwide (Mueller, 2022).

Table 10. Steel & Aluminum Tariff Battles

Activity	Timeline	Affected Nations
U.S. Tariff announcement	March 1, 2018	$48 billion of imports; Canada, EU, Mexico, South Korea, and China
EU threatens to rebalance	March 7, 2018	$3.4 billion of U.S. exports (cranberries, Harley Davidson motorcycles, blue jeans, and bourbon
NAFTA exemptions	March 23, 2018	Canada and Mexico; excludes $15.3 billion of earlier hikes
Tariffs in Effect	March 23, 2018	25% on countries that exported $10.2 billion of steel products to the U.S. in 2017 and 10% on countries that exported $7.7 billion
South Korea gets an exemption, gets quota (2.68 mt)	March 28, 2018	Korea
China retaliates	April 2, 2018	U.S.; $2.4 billion exports of waste and scrap, pork, fruits, nuts, others
Tariff exemptions extension	April 30, 2018	EU, Canada, Mexico, Argentina, Australia, and Brazil
U.S. ends tariff extension on EU, Canada, and Mexico	June 1, 2018	EU, Canada, and Mexico, with Australia remaining the only trade partner without tariff
EU retaliates on iconic American goods	June 22, 2018	$3.2 billion U.S. exports
Canada retaliates	July 1, 2018	$12.8 billion U.S. exports
Higher rates for Turkey as a result of their currency depreciation	August 10, 2018	Turkey
Turkey retaliates	August 14, 2018	The U.S.
The U.S. lifts tariffs on Canada & Mexico	May 17, 2019	Canada and Mexico (a boost for US-MCA ratification)
Trump broadens tariffs	Jan. 24, 2020	$450 million exports for Taiwan, Japan, EU, and China
Trump reimposes tariff on Canadian aluminum	August 20, 2021	Canada
Canada retaliates	Sept. 15, 2020	The U.S.
Biden reinstates duties on aluminum from UAE	Feb. 1, 2021	UAE
Biden's reached an agreement on the removal of Trump's EO 232 TRQs for straight duties.	Takes effect on January 1, 2022	The EU

Source: (Brown and Kolb, 2023)

The War in Ukraine

The Ukraine-Russia War has had significant implications not only for the region but for global grain and energy markets as well. To put it in context, Ukraine stood as the foremost European corn exporter and ranked third globally, trailing only the United States and Argentina (Ziolkowski, 2023). As of 2021, corn exports from Ukraine constituted an 11.8% share of worldwide exports (ibid). According to Ziolkowski (2023), the EU relies on corn imports, which are essential for feed production, and due to disruption in grains supply chains caused by the Russian invasion, the EU will have to source corn from the United States, Argentina, and Brazil, changing global trade patterns for grain supplies. Aizenman (2023) highlights the implications of the Ukraine-Russia War on global supplies, contending that there was a 15-20% jump in the price of corn and soybeans in the first week of the war. Similarly, findings from a quantitative assessment of the impact of the war on global grains markets indicate that the conflict resulted in decreased grain production and exports from Ukraine, leading to increased price volatility in global markets (Janzen and Zulauf, 2023).

Additionally, the war in Ukraine has caused a dramatic shift in the landscape of global energy. Prior to the start of the war, energy demand was already surpassing available supply leading to a 60% oil price increase (Butler, 2022). Likewise, the war and economic sanctions on Russia have disrupted Russian supplies of natural gas especially to Europe, which has benefitted American suppliers (Birol, 2022).

Supply cut offs from Russia that are already in effect could mean a shortfall of up to 30 billion cubic meters of natural gas by the end of 2023 (IEA, 2023.). As a result, focus is shifting towards renewable and nuclear energy options (ibid). However, these actions will not provide immediate relief as renewable energy projects can take anywhere from two to 15 years to come online (Butler, 2022). In addition, the transportation infrastructure necessary to support these new supply chains and shipping routes is yet to be developed.

Short Sea Shipping

Short Sea Shipping (SSS) is the movement of cargo and/or people by sea between ports along a coastline. This is distinct from over-ocean maritime trade, which accounts for approximately 90% of international goods movement. In global supply chains, logisticians employ multiple modes: trucking, rail, ship, barge, and air to deliver freight to consumers. The European market moves 45.6% of freight by road and 40% by sea (Morales-Fusco, Saurí, and De Melo, 2013). The transportation systems of the U.S., Canada, and Mexico, by contrast, were not developed with international trade in mind which has intensified a mismatch in freight flow between these nations (Bhagwati and Panagariya, 1996). Historically, the U.S. and Canadian populations diffused westward, generating the infrastructure supporting east-west flow. Mexico's freight transportation developed outward from Mexico City, its boundaries combining with its economy, creating a north-south flow. In the USMCA, all three countries targeted a north-south flow that was not fully supported by the existing infrastructure networks. Thereby, SSS is a logical solution to this flow challenge, is environmentally beneficial, and could generate more transportation options for additional regional trade. See Figure 21.

The U.S. is uniquely suited to benefit from this approach. As Zeihan (2014, p. 46) states, "The Mississippi River is the world's longest navigable river at 2,100 miles long from its mouth

at the Gulf of Mexico to its head of navigation in the Twin Cities in Minnesota." Collectively, the U.S. is home to 12 navigable rivers and 3,000 miles of shielded navigable bays. The preponderance of refineries in the U.S. Gulf Coast and the ability of the inland river system to safely move LNG into the Gulf may provide new incentives for U.S. policymakers to change cabotage laws, which govern the movement of domestic- and foreign-flagged marine vessels between ports of call on domestic waterways. Currently, the Merchant Marine Act of 1920, often referred to as the Jones Act, governs shipping activity in the U.S. and it was designed to protect domestic maritime shipping by requiring shipments between U.S. ports to be made by U.S.-flagged vessels.

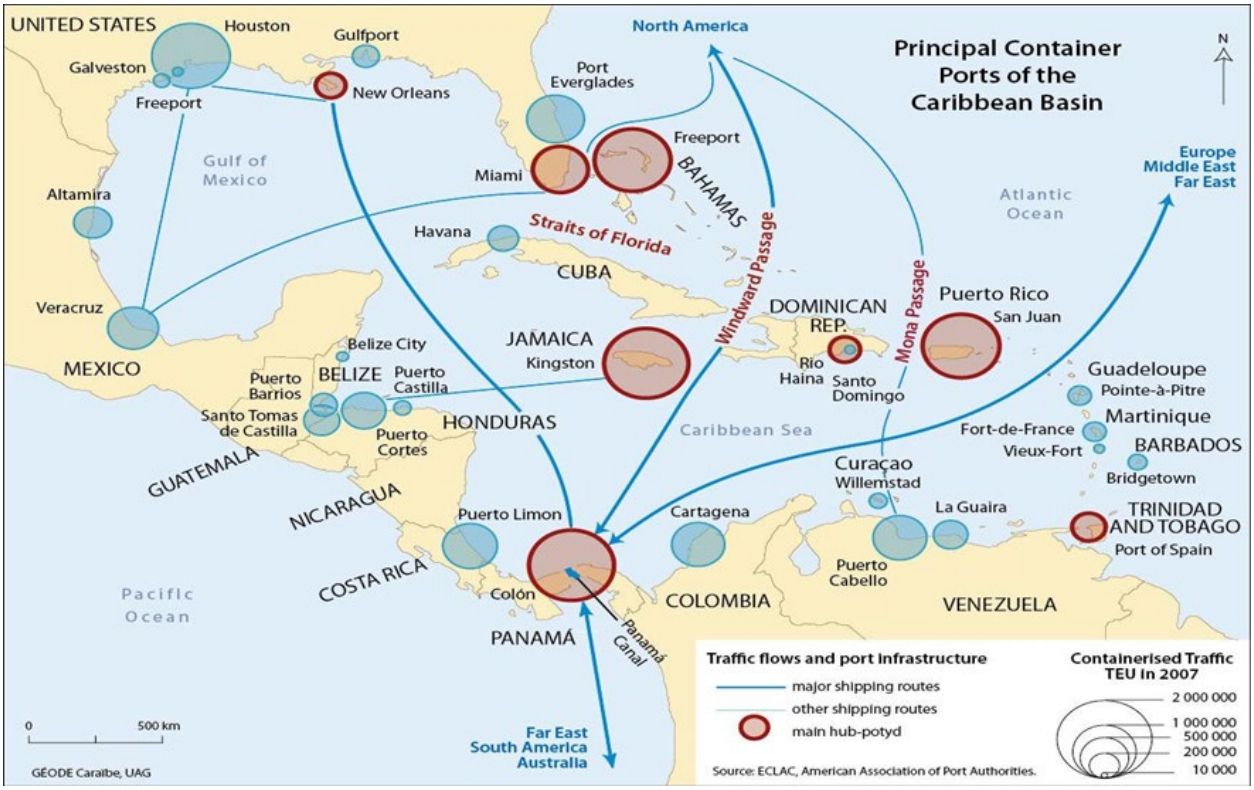

Figure 21. Map of Gulf of Mexico Port Infrastructure and Freight Flows
Source: Stich et. al. (2016)

Cuba is a notable outlier in this discussion (Zeihan, 2014, p. 271). Expanding U.S.-Cuba trade has operational and regulatory implications for the U.S. energy industry through the reduction of Jones Act restrictions and the lifting of economic sanctions allowing direct vessel movements between the U.S. and Cuba. This would encourage the expansion of SSS operations in the Gulf of Mexico as southward petrochemical flows increase, creating a demand for services like container on barge shipping (U.S. Department of Transportation Maritime Administration, 2011). With the expanded Panama Canal and the improvements to the Cuban port infrastructure, Cuba becoming a maritime transport load hub is a real possibility.

Beyond reductions in congestion, SSS improves energy efficiency, reduces pollution, reduces roadway maintenance costs, extends transport infrastructure, applies roll-on/roll-off technology, and supports economies of scale (Seymour and Castel, 1989). However, SSS does have drawbacks, such as increased transportation time, high vessel costs, added transshipment costs, and increased administration. A strength, weaknesses, opportunities, threats (SWOT) analysis found the benefits of SSS included energy efficiency, low pollution, reduced road and rail, and reduced traffic infrastructure spending (ibid). The risks of expanding SSS involve port congestion, new bureaucracies, prioritization of other modes, and stricter environmental regulations (ibid).

From Global to Regional Trade

Prior to the pandemic, international trade appeared to be on a trend towards regionalization. However, experts are unable to determine whether this trend will continue post pandemic. Some economists (Altman and Bastian, 2023) argue that the trend of regionalization only lasted from 2012-2016 and assert that the regionalization trend was based on subjective data and is refuted by the absence of an apparent trend when the regions are reclassified in other ways (ibid). Figure 22 shows different ways that regions can be visualized, and Figure 23 shows the percentage of inter-regional trade under each alternative regionalization option.

Economists argue that these conflicting figures illustrate a failure for regionalization as a sustainable trend because "We would expect a shift towards more regionalized trade patterns to be accompanied by a decline in the average distance traversed by trade flows." (*ibid*, para. 5). A longer period of analysis will be necessary to determine which side is correct.

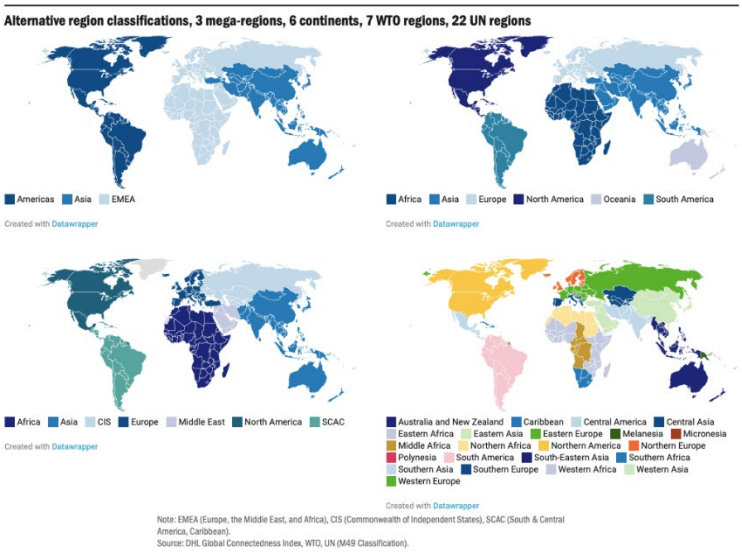

Figure 22. Alternative Region Classification Options

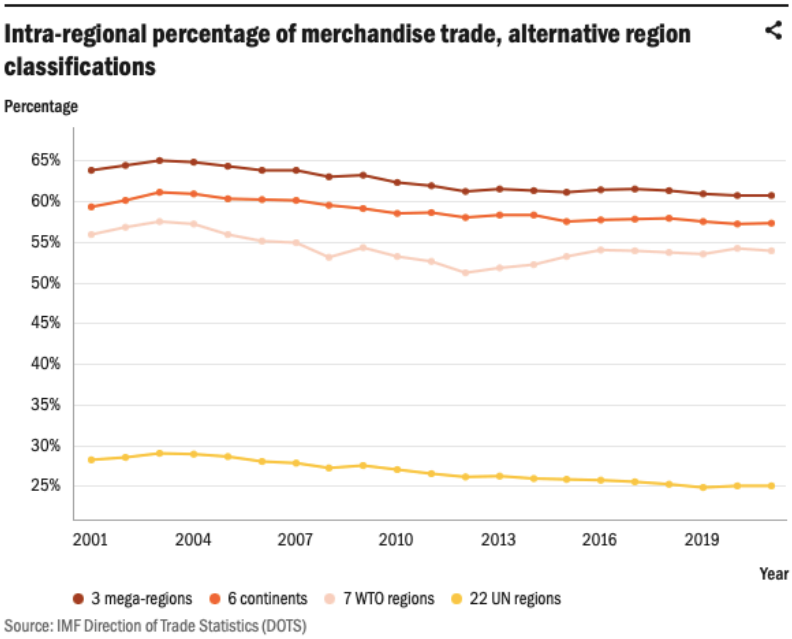

Figure 23. Intra-regional Percentage of Merchandise Trade

BENEFITS OF IMPLEMENTATION

A key finding of the policy evaluation process is the importance of working across multiple levels of government. Whereas this is something the U.S. transportation coalition has done successfully for decades, the trade coalition has not. Given that this effort found that the trade wars generated by the tariff increases caused a decrease in regional and state GDP and job numbers (though to varying degrees of significance), a lack of coordination between these two critical coalitions did have a negative effect on the Louisiana economy. Although it is tempting to conclude that protectionist policies in the form of increasing tariffs on trade always generate negative impacts on affected areas, these results may be geographically specific and not broadly applicable to other regions of the country. Additional research in other regions would be desirable. In any event, this effort underscores the mutual benefits of trade and transportation industry partners working together as advocacy coalitions. Figure 24 is a proposed starting place from which these discussions could begin.

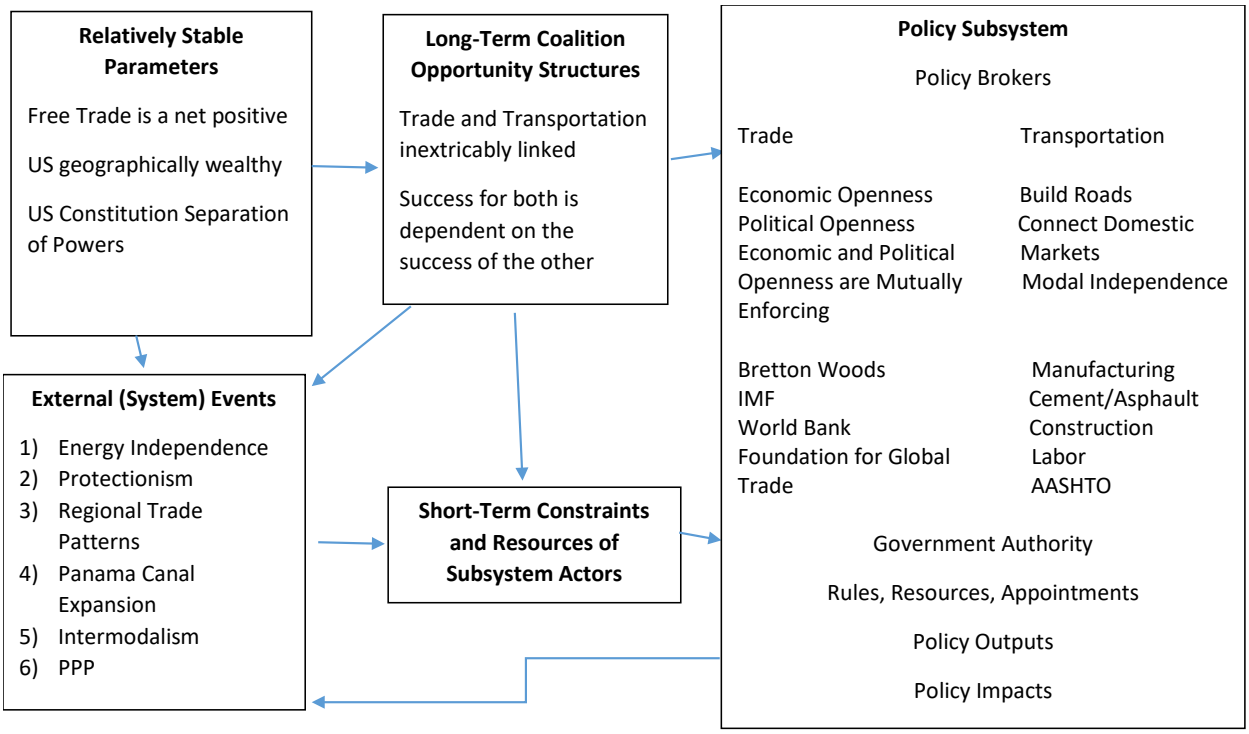

Figure 24. Outline of the Key Features of Improved Collaboration Between the U.S. Trade and Transportation Coalitions

RECOMMENDATIONS AND CONCLUSIONS

Results from the quantitative analysis indicate that the increase in steel and aluminum tariffs implemented by President Trump's administration, and mostly still in place during President Biden's administration, have had differing effects on Louisiana's ports, regions, and the state as a whole. While the tariff increases have led to a decline in exports of corn and soybeans in all three ports exporting these grains, not all of the impacts have been statistically significant. The Port of Greater Baton Rouge and the Port of South Louisiana were significantly impacted while Plaquemines Port Harbor and Terminal District was not. The Port of New Orleans witnessed a statistically significant decline in the imports of steel, while St. Bernard Port, Harbor and Terminal District did not. Additionally, the impact of the tariff on imports of aluminum was not statistically significant for either the Port of New Orleans or Plaquemines Port Harbor and Terminal District. The tariff increases caused a steeper decrease in GDP contribution to the transportation and warehousing sector in the New Orleans-Metairie region than in the Baton Rouge metropolitan statistical area and an even smaller decrease at the state level than in both regions (where the state contribution began to increase after 2020). Similarly, there is a steeper decrease in job numbers within the New Orleans-Metairie region compared to statewide negative impacts.

As fewer barges of aluminum and steel went north to the U.S. Rustbelt, fewer barges were available to bring the corn and soybeans down to the coast from the Midwest. This exacerbated the economic impact of China's retaliatory policies (which lessened demand) as the price of these commodities substantially increased to account for this additional transportation

cost, ultimately making U.S. corn and soybeans too expensive for other markets, resulting in the commodities rotting in the fields or being plowed under (Martin, 2018).

While Bretton Woods clearly marked a new era for the global economy, its usefulness and benefits are being challenged on several fronts. The nationalistic wave, the desire for more regional instead of global trading partners, and the emergence of the U.S. as an energy exporter instead of an energy importer all signal a need for the trade coalition to modernize. Whereas in the past, the trade coalition worked to achieve import and export advantages for the U.S. economy, they did so without considering the capacity of the U.S. transportation system. This should no longer be so.

Proponents of regionalization argue that while the pandemic might have altered the course of trade, trade trends usually take at least 10-15 years to develop and that it is too soon to determine whether or not regionalization is a trending pattern that will resume post pandemic (Baschuk, 2022). They assert that regionalization is still a viable option because "countries in the same region are five times more likely to be linked by a trade agreement and nearly three times more likely to share a common official language" (Altman and Bastian, 2023, p. 7). Additionally, they contend that current issues like war, supply chain disruptions, technological changes, and national security concerns could continue to shift supply chains into a shorter and more regional model for reliability (Baschuk, 2022). The ACF posits this long-term approach is necessary, particularly when discussing devil shifts in policy subsystems of which a regional approach to trade certainly qualifies.

On the other hand, the transportation coalition should be more engaged with the trade coalition to support and promote transportation industries. For example, if a third of the U.S. railroad industry's revenue is tied to trade and 40% of the commodities moved by rail are foreign trade, the railroad industry's ability to forecast equipment needs and plan for future investments is dependent on the ability of the trade coalition to negotiate and support international agreements. If trade does indeed become more regional, the transportation coalition should work to amend the Jones Act to better support regional trade and SSS.

As in many large collaborative projects, missteps between the transportation and trade coalitions have occurred. For example, at the start of the Interstate Highway System, the initial designs did not consider the vertical clearances needed for large U.S. missiles and other military hardware to travel beneath overpasses. More serious perhaps, was the unintended consequences of the interstate systems gutting the very cities they were intended to serve (Weingroff, 1996). These missteps highlight the breakdowns between planning, design, and implementation that occur all too frequently (Flyvbjerg and Gardner, 2023). Competing beliefs coupled with competing coalitions of actors can explain some of these challenges. The National System of Interstate and Defense Highways is an example of alliances striving for similar outcomes; however, due to their inability to communicate through disparate sub-systems, they ended up falling short of the intended goal. Nevertheless, our national interstate system has proven to be efficient and capable of transporting commerce throughout the interior of the United States. If it is to remain so, and to avoid the mistakes of the past, it should work in tandem with what remains of the reciprocity trade coalition.

As the policy actors engage with each other, they should identify shared beliefs and what technological information they have that is in alignment and what may need to be developed. The lengthy tenure of both coalitions in the U.S. minimizes the amount of policy learning that is necessary; instead, the coalitions should focus on working together to ensure that their shared beliefs can be carried over into trade and transportation policies that support both industries. The results of this effort also supports the value of the Advocacy Coalition Framework not only as a useful tool in the policy evaluation process but also as a means to "…center on the behavior of coalition actors who directly or indirectly attempt to influence policy processes" (Sabatier and Weible, 2014, p. 183).

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