ANALYSIS

Potential Impact of a **Rail Strike** on the U.S. Economy

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Analysis Background

Freight rail is critical to ACC's members and chemical manufacturing. U.S. chemical manufacturers are one of the largest users of freight rail – shipping more than 33K carloads per week worth $2.8 billion. The expansion of U.S. chemical manufacturing means our transportation needs are growing. With announced investments of more than $200 billion and over 350 chemical manufacturing projects, we expect to add 200,000 railcar shipments per year by 2030.

The threat of a rail strike comes at a time when companies are experiencing major supply chain challenges related to freight rail delays and service problems.

Chemical manufacturers are one of the first industries impacted by the threat of rail strike. To prepare for a shutdown, railroads stop accepting security sensitive shipments. These shipments include chemicals that are critical to safe drinking water and support industries that account for almost four percent of the U.S. Gross Domestic Product, including energy refining and the production of semiconductors, pharmaceuticals, and fertilizers.

A rail strike would broadly curtail production for ACC members within days. Given the complexity of these operations, chemical facilities typically don't have more than 4-5 days' worth of empty cars or raw materials on hand. Facilities will cut production to delay a shutdown for as long as possible, but by 5-7 days, many sites would face full shutdowns.

Because of the interconnectedness of the supply chain, ACC wanted to know how a one-month rail strike would impact all business sectors and the entire economy.

Summary of Findings

JOB LOSS

The U.S. economy would **lose 700,000 jobs** across multiple industries and economic sectors.

ECONOMIC SLOWDOWN

The Gross Domestic Product (GDP) would contract by one percentage point, which would pull almost **$160 billion out of the economy.**

INFLATION SPIKE

The Producer Price Index (PPI) would **jump by four percent.**

Detailed Findings

TABLE **Potential Impact of Rail Strike on U.S. Economy**

Relative to Baseline (%), First Half of 2023		
	1-Month Strike	**2-Month Strike**
Employment	-0.5%	-1.4%
PPI	+4%	+12%
Retail Sales	+1%	+1.3%
Real GDP	-1%	-2%
Manufacturing Shipments*	-3%	-7%

*Inflation Adjusted

The results are profound, even for a strike lasting one month. The simulation shows that inflation rises as transportation and input costs for manufacturers soar (the producer price index (PPI) rises by 4%). Fearing shortages, consumers will also add to inflationary pressure by paying more for the limited inventories that retailers have access to (retail sales increase by 1%). With added pressure to the already high inflation, the Fed will be forced to raise rates even more than it already had, which will send the economy into a recession earlier than anticipated, and perhaps for longer.

While production can continue with the inventory of materials in hand, many companies will have to postpone deliveries or cancel orders altogether as supplies run out. The result will be significantly fewer manufacturing shipments to stores and other sectors of the economy during the first half of 2023. With fewer goods available for sale, employment and GDP will be impacted. If the strike lasts one month, the economy will lose about 700,000 jobs during the first half of 2023, erasing hard-won gains over the past several months. If the strike lasts two months, job losses can reach up to 2 million, eliminating about half the jobs gained so far this year. GDP will lose about 1% ($156 billion) if the strike lasts one month and about 2% ($379 billion) if the strike lasts two months.

Methodology

To evaluate the potential impact of a rail strike on entire the U.S economy, ACC used a scenario-based simulation which allows us to visualize and quantify its effects on the different segments of the economy.

ACC generated three scenarios: Baseline (no strike), 1-Month Strike (a strike lasting one month), and 2-month Strike (a strike lasting two months). We included key macro sector variables that are most relevant to the simulation, including real GDP, employment, value of manufacturing shipments, producer price index (PPI), retail sales, and rail traffic.

We used Vector Auto Regression (VAR) to simulate the impact of a rail strike on the economy. The included time series are: real GDP, producers price index, advance retail sales, the real value of total manufacturing shipments, rail freight carloads, rail freight intermodal traffic, and total non-farm employment. All data are sourced from the St. Louis Federal Reserve Economic Data (FRED) program.

Fitting a Vector Auto Regression requires selected variables to show the presence of feedback loops. We performed a granger causality test to identify feedback loops, and feedback loops were detected. Another requirement for VAR is to choose length lags without autocorrelations. To achieve this, we performed a lag length criteria test and autocorrelations LM test. A lag length of 9 was chosen as it avoids autocorrelation and has one of the lowest AICs.

To simulate the effect of a rail strike, we created three scenarios. These scenarios include Baseline, 1- Month Strike, and 2-Month Strike. The baseline scenario assumes no rail strike. Scenario 1 assumes the Strike will last one month, starting November 2022, and scenario two assumes the Strike will last start at the beginning of November and ends at the end of December, or two months. The results were modeled for the first two quarters of 2023.

This report was prepared by **ACC's Economics and Statistics Department**. Questions about the survey and findings may be directed to David Lan, *Director, Policy Analysis & Statistics* (david.lan@americanchemistry.com).

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