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RESEARCH SUMMARY

THE REGULATORY DETERMINANTS OF RAILROAD SAFETY

This study is published in the Review of Industrial Organization *volume 49, issue 2, and is available via SpringerLink at "The Regulatory Determinants of Railroad Safety."*

Railroad safety has dramatically improved over the past 40 years. Determining why this improvement occurred may provide lessons for future regulatory reform. During this period, the freight railroad industry experienced significant reductions in economic regulation and considerable expansion of safety regulation.

In a new study published in the *Review of Industrial Organization*, authors Jerry Ellig and Patrick A. McLaughlin, both senior research fellows for the Mercatus Center at George Mason University, seek to determine the relative impact on railroad safety of each set of regulatory adjustments: more safety regulation and less economic regulation. They conclude that the partial economic deregulation of the railroad industry accounted for the vast majority of the improvements to railroad safety that occurred over this time period by restoring normal market incentives for firms to maintain track and equipment and pursue other safety measures. Safety regulation also contributed to increases in safety, but this effect mostly occurred before partial economic deregulation in 1980.

BACKGROUND

From 1978 to 2013, the number of accidents experienced by the major freight railroads plummeted from more than 11,000 to 1,867, despite rail miles traveled doubling over that time. Significant changes in both economic and safety regulations with the potential to affect railroad safety occurred during this same period:

- Partial economic deregulation followed the Staggers Act of 1980. This law deregulated most rail rates and made it easier for railroads to discontinue unprofitable service.
- Safety regulations from the Federal Railroad Administration (FRA) quadrupled in the decades following Congress's expansion of the FRA's authority with the Federal Railroad Safety Act of 1970.

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METHODOLOGY AND DATA

New data provided by RegData, a database developed by scholars at the Mercatus Center, enables measurement of the changing amounts of economic and safety regulation affecting the railroad industry from 1975 to 2013.

- RegData parses the text of federal regulations published each year in the *Code of Federal Regulations* and uses machine learning algorithms to determine the relevance of regulations to individual industries—in this instance, the railroad industry.
- RegData measures the amount of applicable regulation by counting regulatory restrictions—words and phrases that either obligate or prohibit an action, such as "must," "shall," "prohibited," and "required."

Data compiled by RegData on economic and safety regulations applicable to the railroad industry between 1975 and 2013 permit an assessment of the relationships between these types of regulation and railroad accident rates. (The study focuses on freight railroads with annual operating revenues of more than $250 million. Passenger rail services such as Amtrak are not included.)

KEY FINDINGS

Economic Deregulation of Railroads Is Associated with Large Improvements in Safety
Under normal market circumstances, railroads have a direct incentive to prevent accidents that damage their property or harm employees. Economic regulation impaired these incentives:

- Before 1980, heavy economic regulation reduced railroads' profitability, bankrupted some railroads, and limited others' ability to attract capital. These economic conditions discouraged investment in maintenance, resulting in less safe track and equipment, and slowed the development and adoption of new technology that would improve safety.
- In addition to hampering investment, economic regulation forced railroads to operate in ways that increased accident risks. For example, in the period after partial deregulation, the consolidation of routes and widespread use of unit trains—largely infeasible beforehand—improved safety by reducing the amount of railcar switching, a hazardous activity.

Additional Safety Regulation Has Had Relatively Little Effect on Safety Improvements Since the Staggers Act of 1980
Before 1980, safety regulations appear to have substituted for economic incentives to improve railroad safety. The number of railroad accidents fell slightly during this time. The bulk of the improvements to railroad safety did not happen until after passage of the Staggers Act, however. Although the stock of safety-related regulatory restrictions published by the FRA has quadrupled since 1975, the Staggers Act accounted for about 89 percent of the decline in the accident rate between 1978 and 2013.

One possible reason safety regulations have had a small impact is that rail safety regulations often consist of design standards rather than performance standards. This diverts attention away from safety outcomes and toward compliance with design requirements alone, and may make railroads

less safe than they would be otherwise. In contrast, performance standards permit each railroad to come up with its own design to achieve a desired safety outcome.

CONCLUSION

These findings should motivate policymakers and stakeholders who are concerned with rail safety to carefully reassess existing rail safety regulations to determine which have been effective and which have not. More broadly, it is clear that economic deregulation improved safety more effectively than actual safety regulations by restoring market incentives for firms to pursue safety measures and innovations instead of focusing on complying with regulatory mandates.