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INNOVATION ON THE WATERFRONT—THE REGULATION OF AUTONOMOUS AND REMOTELY CONTROLLED COMMERCIAL VESSELS[1]

By Katie Smith Matison[2]

INTRODUCTION

The use of autonomous and remotely controlled vessels will certainly revolutionize the commercial shipping industry. Yet, regulatory and legal compliance will create challenges as autonomous and remotely controlled ships are routinely used in the context of commercial shipping and the global transportation of cargo. Several of the legal issues that may impact autonomous shipping are discussed below including (i) statutes and treaties for the common carriage of cargo; (ii) environmental concerns; (iii) marine insurance; (iv) regulations of commercial shipping; (v) liability to seafarers; and (vi) construction and design of commercial vessels. Accordingly, it is likely that the myriad of statutes, treaties, and regulations governing commercial shipping will be amended and that new legislation will be necessary to adapt to the exciting changes on the horizon.

[1] This paper was presented at the Transportation Lawyers Association meeting in Williamsburg, Virginia on May 12, 2022, and is republished here with the gracious approval of the Transportation Lawyers Association.

[2] Katie Smith Matison is a shareholder in the Seattle office of Lane Powell PC, where she is the chair of the firm's Transportation Practice. She served as President of the Association of Transportation Law Professionals from 2012 – 2013, and currently serves as the Chair of the Publication Committee. Katie was awarded a J.D. and LL.M. in Admiralty, with distinction, from Tulane University School of Law in New Orleans, Louisiana.

I. Legal Considerations of the Commercial Shipping Industry.

A. The Critical Importance of the Shipping Industry in World Trade.

The shipping industry is an indispensable element of global trade. The United Nations Conference on Trade and Development ("UNCTAD") reports that 80% of all cargo in global trade by volume and 70% of all global cargo by value is transported by the shipping industry.[3] In a 2018 review of maritime trade, UNCTAD referred to "*maritime transport*" as the "*backbone of international trade and the global economy*."[4] The International Chamber of Shipping ("ICS") reports that approximately 11 billion tons of cargo are carried aboard commercial ships every year. The cargo transported across the world by commercial ships includes consumer goods as well as bulk cargo in vast quantities.[5] Moreover, commercial shipping is an affordable mode of transport and the shipping industry has "*sophisticated logistics chains*."[6] The World Economic Forum ("WEF") reports that over the past 20 years, the size and carrying capacity of many container ships has increased dramatically.[7] Accordingly, maritime transport of cargo is integral to world trade.

B. Commercial Shipping and Cargo Carriage Is a Highly Regulated Industry.

All aspects of commercial shipping and common carriage of cargo in the United States are governed by statutes and federal regulations. For

[3] UNCTAD, Review of Maritime Transport, https://unctad.org/webflyer/review-maritime-transport-2018 (last visited Dec. 20, 2022).

[4] *Id.*

[5] ICS, "Shipping and world trade: driving prosperity," https://www.ics-shipping.org/shipping-fact/shipping-and-world-trade-driving-prosperity/ (last visited Dec. 20, 2022).

[6] *Id.*

[7] WEF, "Our economy relies on shipping containers. This is what happens when they're 'stuck in the mud'," (Oct. 1, 2021, https://www.weforum.org/agenda/2021/10/global-shortagof-shipping-containers/. In fact, the WEF reports some the largest sailing ships today have a

example, the rights and duties of shippers of cargo aboard common carriers who issue a bill of lading for international voyages either originating from or arriving in the United States are controlled by the *Carriage of Goods by Sea Act* ("COGSA"), 46 U.S.C. § 30701.[8] COGSA is a codification of the *International Convention for the Unification of Certain Rules relating to Bills of Lading, and Protocol of Signature* known as the Hague Rules of 1924.[9] All bills of lading issued by a common carrier are controlled by the *Federal Bills of Lading Act*, 49 U.S.C. §§ 80101 – 80116. The *Shipping Act of 1984*, 46 U.S.C. §§ 40101, *et. seq.*, as amended by the *Ocean Shipping Reform Act of 1998* ("OSRA") Pub. L. 105-258, 112 Stat. 1902, governs Vessel Owning Common Carriers ("VOCC"), Non-Vessel Owner Common Carriers ("NVOCC"), Shipper Associations, Ocean Transportation Intermediaries ("OTIs"), and publication and filing of ocean transportation rates. The Surface Transportation Board ("STB")[10] has regulatory authority over water carriers in domestic trade. The Federal Maritime Commission ("FMC") is an independent agency that regulates terminal operators, ocean common carriers, as well as freight forwarders.[11]

The design, construction, and operation of United States vessels is controlled by Title 46 of the United States Code in §§ 3101 through 4501 and

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carrying capacity of 24,000 containers. WEF states that $14 Trillion of cargo in global trade has been transported by containers.

[8] COGSA was previously codified in 46 U.S.C. §§ 1300 – 1315.

[9] The Hague Rules were amended in 1931, 1977, and 1982 and now are referenced as the Hague-Visby Rules. The *United Nations International Convention on the Carriage of Goods by Sea Act adopted in Hamburg in 1978* resulted in the *Hamburg Rules* which became effective on November 1, 1992. The United Nations Conference on Trade and Development ("UNCITRAL") promulgated the *Convention on Contracts for the Carriage of Goods Wholly or Partly by Sea* in 2008 for the purpose of synthesizing laws of maritime nations in international trade. The *Rotterdam Rules* are not yet in effect.

[10] STB, https://www.stb.gov/ (last visited Dec. 20, 2022).

[11] FMC, https://www.fmc.gov/about-the-fmc/ (last visited Dec. 20, 2022). The stated mission of the FMC is to "ensure a competitive and reliable international ocean transportation supply

the applicable regulations. The United States Coast Guard of the Department of Homeland Security maintains an Office of Design and Engineering Standards ("CG-ENG") for the purpose of developing and promulgating national design standards. The CG-ENG consists of four divisions for (i) naval architecture; (ii) systems engineering; (iii) lifesaving and fire prevention; and (iv) hazardous materials.[12] The *Merchant Marine Act of 1920*, 46 U.S.C. §§ 50202, *et. seq*., governs coastwise trade and the obligations of shipowners to *Jones Act* seamen. The requirements for vessels eligible for U.S. documentation are contained in 46 U.S.C. §12102 and 46 C.F.R. Part 67.

Environmental pollution of navigable waters of the United States caused by the shipping industry is a major concern and is highly regulated. Environmental contamination is enforced and regulated by the Coast Guard, Environmental Protection Agency and the Department of Justice. The United States Congress passed the *Ports and Waterways Safety Act*, 33 U.S.C. § 1221; and the *Prevention of Pollution from Ships Act*, 33 U.S.C. §§ 1901, *et. seq*., to codify the United States ratification of MARPOL.[13] The *Federal Water Pollution Control Act*, 33 U.S.C. §§ 1251, *et seq*., and the *Oil Pollution Act of 1990*, 33 U.S.C. §§ 2701 to 2761 are critical statutes regulating environmental concerns and contamination originating from vessels.

C. The Hazards of the Commercial Shipping Industry.

Commercial cargo ships and barges laden with bulk commodities and consumer products ply the earth's oceans, rivers, seas, and inland waters. During these voyages, however, there are common perils unique to the shipping industry that result in catastrophic damage or total loss of vessels, cargo containers, and the personal injury or death of crewmembers. Collisions,

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system that supports the U.S. economy and protects the public from unfair and deceptive practices."

[12] U.S. Coast Guard, CG-ENG, https://www.dco.uscg.mil/CG-ENG/ (last visited Dec. 20, 2022).

[13] The *International Convention for the Prevention of Pollution from Ships* (MARPOL).

turbulent weather or volatile sea conditions, fire, sinkings, breakdown of machinery, hijackings, vessel instability, and allisions are some of the common perils. In addition, the inherent risks in the ocean transportation of bulk cargo are common, including shifting cargo, loss of cargo, dust, oil spills, oxygen depletion, corrosion, breakdown of refrigeration equipment in containers of perishable food products, and contamination, often resulting in a total or partial loss of the cargo.[14] These common hazards often culminate in large insurance claims, litigation, and declarations of general average.[15]

D. Maritime Losses Attributable to Human Error, Faulty Equipment, and Negligence.

Maritime losses are often attributable to human error. Marine Insight explains that the causes of human error are often attributable to fatigue, lack of knowledge, bad decisions, and poor communication of crew and individuals in the logistical chain.[16] Some authorities, after examining marine accidents published by the National Transportation Safety Board ("NTSB"), assert that human error is the cause of more than 50% of marine casualties.[17] Although the *International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers, 1978* ("*STCW Convention*") is believed to have

[14] Paromita Mukherjee, "9 Common Hazards Of Bulk Cargo On Ships," *Marine Insight*, Apr. 11, 2021, https://www.marineinsight.com/marine-safety/9-common-hazards-of-dry-bulk-cargo-on-ships/.

[15] In a general average claim, the ship and cargo share a percentage of the loss caused by the common adventure. *See York-Antwerp Rules 2016*, https://transportrecht.org/wp-content/uploads/YorkAntw2016.pdf (last visited Dec. 20, 2022).

[16] https://www.marineinsight.com/marine-safety/the-relation-between-human-error-and-marine-industry/.

[17] Marine Insight, "*The Relation between Human Error and Marine Industry*," (Sept. 8, 2019), https://www.sciencedirect.com/science/article/pii/S2666822X21000083. Javier Sanchez-Beaskoetxea, "*Human error in marine accidents: Is the crew normally to blame?"* Marine Transport Research, Vol. 2, 2021, 100016. Carine Dominguez-Pary, Lakshmi Narasimha Raju Vuddaraju, Isabelle Corbette-Etchevers & Rana Tassabehji, "*Reducing maritime accidents in ships by tackling human error: a bibliometric review and research agenda*," Journal of Shipping and Trade, Art. No. 20 (2021).

reduced human error substantially, human error remains the cause of many marine casualties. Accordingly, the question remains—are remotely controlled or autonomous ships a safer alternative for the future of the shipping industry?[18]

Negligence and human error in the shipping industry has a cost of personal injury or death. The United States provides an extensive spectrum of statutory and general maritime law protection to crewmembers who are killed, injured, or fall ill while in the service of the vessel. The *Jones Act*, 46 U.S.C. § 30104, provides that a seaman or his personal representative has a cause of action against his employer for negligence. A *Jones Act* seaman's personal representative has a cause of action against the maritime employer under the *Death on the High Seas Act*, 46 U.S.C. §§ 30301 – 30308. A crewmember has a cause of action arising under the general maritime law for a breach of the warranty of seaworthiness for faulty equipment or the appurtenances that are not reasonably fit for their intended use.[19] A seaman's employer is required to pay maintenance and cure for a seaman who is injured or falls ill in the service of the ship until he reaches maximum medical recovery.[20] This complex network of statutes and the federal general maritime law will certainly need to be expanded or adapted as necessary to account for the emerging technology of autonomous vessels.

E. The Evolution of Marine Insurance Coverage for the Shipping Industry.

Marine insurance has evolved through the centuries to protect shipowners and shippers of cargo against fortuitous losses and perils of the seas. Lloyd's of London ("Lloyd's") had its genesis in Edward Lloyd's Coffee House on Tower Street in London in 1688 and the business of shipping was

[18] Marine insurance also insurers against the negligent acts and omissions of the crew and some risks that may occur during the course of shipping of cargo.

[19] The seminal case is *Mitchell v. Trawler Racer, Inc.*, 362 U.S. 539, 550, 80 S. Ct. 926, 933 (1960).

[20] *Calmar S.S. Corp. v. Taylor*, 303 U.S. 525, 58 S. Ct. 651 (1938); *Atl. Sounding Co., Inc. v. Townsend*, 557 U.S. 404, 129 S. Ct. 2561 (2009).

discussed.[21] Approximately 40 years later, Lloyd's moved to Lombard Street and began to dominate the industry of marine insurance in support of England's busy maritime industry.[22] The purpose of marine insurance that evolved over the years was to insure against fortuitous losses to protect the insured's interest in the ship, cargo, as well as to protect crewmembers and defend against third party claims. Today, marine insurance is a major industry insuring against losses in the marine industry and providing insurance coverage against liability claims.

The English laws of marine insurance have changed in the recent past. For more than 100 years, the *Marine Insurance Act 1906* ("MIA") governed marine insurance claims and transactions in England. The plain language of the MIA was followed as persuasive authority in the United States and provided a uniform template of interpretation of the rights and duties of the insured and insurer.[23]

On August 12, 2016, *The Insurance Act of 2015* came into force and applying to business insurance. *The Insurance Act of 2015* modified the remedies available to an insurer for a material non-disclosure by an insured in a case of the breach of *uberrimae fidei* or utmost good faith incorporated in all

[21] *See* Lloyds, https://www.lloyds.com/about-lloyds/history/ (last visited Dec. 20, 2022). See *Edinburgh Assurance Co. v R.L. Burns Corp.*, 479 F. Supp. 138 (C.D. Cal. 1979) for a detailed description of insurance placement at Lloyd's.

[22] *See* Lloyds, https://www.lloyds.com/about-lloyds/history/corporate-history (last visited Dec. 20, 2022). Today, the Lloyd's market insures many types of risks and accounts for 25% of the world's insurance market.

[23] As an example, the United States adopted the doctrine of utmost good faith or *uberrimae fidei* into all insurance policies requiring the insured to affirmatively provide information to the insurer that would affect an insurer's decision to undertake the risk or set the premium. *Sun Mut. Ins. Co. v. Ocean Ins. Co.*, 107 U.S. 485, 1 S. Ct. 582 (1883). "It is the duty of the assured to place the underwriter in the same situation as himself; to give to him the same means and opportunity of judging of the value of the risks; and when any circumstance is withheld, however slight and immaterial it may have seemed to himself, that, if disclosed, would probably have influenced the terms of the insurance, the concealment vitiates the policy." *Id.* at 510-11.

marine insurance policies. *The Insurance Act of 2015* further modified the 1906 MIA concerning warranty provisions.[24]

Unfortunately, marine insurance laws are no longer a matter of uniform federal law in the United States. In *Wilburn Boat Co. v. Fireman's Fund Insurance Co.*, 348 U.S. 310, 75 S. Ct. 368 (1955), the Supreme Court held that absent well-entrenched federal precedent, state law will apply to the construction of marine insurance policies. Therefore, in the aftermath of the *Wilburn Boat* decision, courts now apply a quilt of both state insurance laws and federal general maritime law principles in evaluating the rights and duties under a marine insurance policy.

The commercial use of remotely controlled and fully autonomous vessels will present new challenges for the marine insurance industry and courts. Traditional insurance policies may not offer adequate coverage for fully or partially autonomous vessels. Accordingly marine insurers will need to adapt with new policies designed to meet the requirements of this innovation for the future of commercial shipping of cargo.

II. The Emergence of Autonomous and Remotely Controlled Commercial Ships

A. Predicted Growth of Autonomous Shipping.

The autonomous shipping industry as well as the Global Ocean Surface Robot Market is predicted to grow at the rate of 26.7% from 2024 to 2035 and is forecast to generate $2.9 Billion in revenue by 2028. Revenue from autonomous ships and remotely controlled ships is expected to increase to more than $3.48 Billion by 2035.[25] Private industry, in collaboration with

[24] *See* Milan Kapadia, "*The Marine Insurance Act 1906 – Not Repealed but Radically Altered*," RWK Goodman (June 24, 2016), https://www.roydswithyking.com/info-hub/the-marine-insurance-act-1906-not-repealed-but-radically-altered/.

[25] *See* ReportLinker, "*Global Autonomous Ship and Ocean Surface Robot Market: Focus on Mode of Operation, Subsystem, End User, and Application – Analysis and Forecast, 2018-2028*" (Aug. 2018), https://www.reportlinker.com/p05483930/Global-Autonomous-Ship-and-

governments, are investing in autonomous ship technology. Autonomous ships and remotely controlled ships are expected to eliminate human error and meet the demand for environmental monitoring, seabed mapping, anti-submarine warfare, and search for underwater mines.[26]

B. The Future Has Arrived—Autonomous and Remotely Controlled Ships Are in Operation Today.

Remotely controlled and autonomous commercial vessels are more than a distant pipedream and are in operation today. As detailed below, autonomous vessels now carry cargo and transport passengers.

1. FALCO.

On December 3, 2018, Finferries, the ferry system of Finland, in conjunction with private industry, demonstrated the FALCO, the world's first fully autonomous car ferry. The FALCO's maiden voyage between Pargus Finland and Nagu was completely autonomous and carried 80 passengers. On the return voyage, the FALCO was remotely controlled by an operator from a shore-based facility.[27]

2. The MAYFLOWER.

The MAYFLOWER is a fully autonomous trimaran designed to sail the North Atlantic and trace the voyage of the Pilgrims. The 100-foot research vessel is powered solely by wind and solar technology and will carry drones on

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Ocean-Surface-Robot-Market-Focus-on-Mode-of-Operation-Subsystem-End-User-and-Application-Analysis-and-Forecast.h.

[26] *Id.*

[27] Press Release, FinFerries, "*Finferries' Falco world's first fully autonomous ferry*" (Mar. 12, 2018), https://www.finferries.fi/en/news/press-releases/finferries-falco-worlds-first-fully-autonomous-ferry.html; Institution of Mechanical Engineers, "*Inside the Falco, the car ferry with artificial intelligence at the helm*" (Feb. 8, 2019), https://www.imeche.org/news/news-article/inside-the-falco-the-car-ferry-with-artificial-intelligence-at-the-helm.

board.[28] The MAYFLOWER completed its new sea trials by March 8, 2022 and on May 20, 2022 left the Azores to continue on its voyage across the Atlantic.[29]

3. The YARA BIRKELAND.

The YARA BIRKELAND is a battery-powered electric inland open top container ship with a capacity of 120 TEU (Twenty-Foot Equivalent Units). The YARA BIRKELAND will have "zero emissions."[30] On November 19, 2021, the vessel departed for its maiden voyage to Oslo, Norway. The YARA BIRKELAND will carry mineral fertilizer this year between Porsgrunn and Brevik in Norway.[31] The vessel was constructed by VARD in conjunction with Enova, a government enterprise for promoting renewable energy in collaboration with Kongsberg Group.[32]

III. The International Maritime Organization Studies Autonomous Ships (MASS)

A. The Importance of the International Maritime Organization.

The International Maritime Organization ("IMO") is the United Nations' specialized agency establishing standards for the safety and security of shipping for all maritime nations. The IMO is the global standard-setting authority for safety standards for international shipping—including the design,

[28] Mayflower Autonomous Ship, https://mas400.com/ (last visited Dec. 20, 2022).

[29] *See id.*

[30] *See* Wikipedia, MV *Yara Birkeland*, https://en.wikipedia.org/wiki/MV_Yara_Birkeland (last visited Dec. 20, 2022).

[31] Press Release, Yara, "*Yara to start operating the world's first fully emission-free container ship*" (Nov. 19, 2021), https://www.yara.com/corporate-releases/yara-to-start-operating-the-worlds-first-fully-emission-free-container-ship/.

[32] *Id.*

construction, equipment, manning, technical cooperation, and energy efficient shipping operations. The IMO is based in London, England and participants consist of 173 Member States and various governmental organizations. The United States is a Member State and the Coast Guard has been a key participant in IMO for policy development and setting safety standards.

B. IMO Strategic Plan and Scoping Exercise.

The IMO has directed its focus on the analysis of the potential regulatory scheme that must be implemented to address the emerging technology of autonomous and remotely controlled commercial ships. The IMO Strategic Plan for the years 2018 through 2023 contains a Key Strategic Direction to "integrate new and advancing technologies into the regulatory framework."[33] Specifically, this Key Strategic Direction entails weighing the benefits of new technology against safety concerns, security, cybersecurity, environmental risks, costs, and the facilitation of international trade. Commensurate with that goal, IMO is conducting an analysis of all applicable treaties in assessing the regulation of Maritime Autonomous Surface Ships ("MASS").[34] Three IMO standing Committees, including the Marine Safety Committee ("MSC"), the Legal Committee ("LGL"), and the Facilitation Committee ("FAL") have commenced a "Scoping Exercise" to analyze MASS against the backdrop of the international treaties that govern the world's commercial shipping industry.

C. The IMO Scoping Exercise—4 Degrees of Vessel Autonomy.

The IMO Scoping Exercise recognizes four (4) Degrees of Autonomy for Marine Autonomous Surface Ships ("MASS"):

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[33] Ship Technology, "*IMO Assembly adopts strategic plan for 2018-2023*" (Dec. 13, 2017), https://www.ship-technology.com/news/imo-assembly-adopts-strategic-plan-2018-2023/.

[34] *See* IMO, Autonomous Shipping, https://www.imo.org/en/MediaCentre/HotTopics/Pages/Autonomous-shipping.aspx (last visited Dec. 20, 2022).

- **Degree 1:** Partial automation and the crew can take over control of the vessel at any time.

- **Degree 2:** The ship is controlled from a remote location, but a crew is onboard and ready to assume control as necessary.

- **Degree 3:** The vessel is controlled remotely from another location and there is no crew on board.

- **Degree 4:** This is a fully autonomous vessel controlled by artificial intelligence that makes decisions and controls actions.

D. International Treaties Considered by MSC, FAL, and LGL Committees.

During the course of the Scoping Exercise, the MSC, FAL, and LGL Committees considered the impact of the Four Degrees of MASS autonomy on international shipping treaties and shipping traffic. One primary underlying purpose was an analysis of any potential gaps in the existing treaties and regulatory framework that the Four Degrees of Autonomy MASS would create.

The **MSC Committee** examined the impact of autonomous shipping against the requirements of several important treaties. The treaties the MSC Committee studied included, but were not limited to, the following:

- *Safety of Life at Sea Convention* ("SOLAS");

- *Collision Regulations; and*

- *Search and Rescue Convention ("SAR").*

The **LGL Committee** evaluated the impact of MASS on 23 Treaties, including, but not limited to, the following:

- *BUNKERS 2001—International Convention on Civil Liability for Bunker Oil Pollution Damage, 2001;*
- *LLMC PROT 1996—Protocol of 1996 to Amend the Convention on Limitation of Liability for Maritime Claims, 1976;*
- *HNS PROT 2010—Protocol of 2010 to the International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea, 1996;*
- *SALVAGE 1989—International Convention on Salvage, 1989;*
- *SUA 1988—Convention for the Suppression of Unlawful Acts against the Safety of Maritime Navigation, 1988;*
- *SUA PROT 2005—Protocol of 2005 to the Protocol for the Suppression of Unlawful Acts Against the Safety of Fixed Platforms Located on the Continental Shelf;*
- *Nairobi WRC 2007—Nairobi International Convention on the Removal of Wrecks, 2007;*
- *PAL PROT 2002—Protocol of 2002 to the Athens Convention Relating to the Carriage of Passengers and Their Luggage by Sea, 1974;*
- *NUCLEAR 1971—Convention relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material, 1971.*

The LGL Committee also considered the following treaties along with the FAL Committee and the MSC Committee:

- *INTERVENTION PROT 1973—Protocol Relating to Intervention on the High Seas in Cases of Pollution by Substances other than Oil, 1973;* and

- *International Convention on Maritime Liens and Mortgages, 1993*.

The **FAL Committee** analyzed MASS with respect to the *Convention on Facilitation of International Maritime Traffic* ("FAL") and the foreseeable challenges that would likely arise from operation of autonomous ships.

E. MSC Committee Conclusions After Scoping Exercise.

The MSC Committee completed the Regulatory Scoping Exercise on May 25, 2021 at the 103rd Session.[35] MSC Committee identified high priority issues for future work and made recommendations:

- The IMO and 174 Member States should create a "MASS Code" to consider all four Degrees of shipping autonomy.

- Internationally accepted MASS terminology and definitions for MASS must be created.

- The identity, responsibility, and definition of any crewmembers aboard a partially autonomous or remotely controlled vessel must be specifically defined.

- The MASS should determine whether the shore-based Remote Control Station and Operators are considered seafarers.

[35] *See* IMO, "*Autonomous ships: regulatory scoping exercise completed*" (May 25, 2021), https://www.imo.org/en/MediaCentre/PressBriefings/pages/MASSRSE2021.aspx.

- The MASS Code should specifically address issues of firefighting, cargo care, stowage, watchkeeping, search and rescue and other safety issues.

The Scoping Exercise Reports of the LGL Committee and FAL Committee are complete.

F. LGL Committee Conclusions After Scoping Exercise

The LGL Committee's primary objection for the scoping exercise was to analyze the degree to which existing framework of conventions would need to be modified. The Committee concluded:

> It was noted that both the Maritime Safety and Legal Committees had concluded that the role and responsibilities of the master and the remote operator are high-priority issues that must be addressed as a foundation for any further work. Some specific legal terms required consideration in the context of harm caused by autonomous technology, like the concepts of "fault", "negligence" and "intention". The LEG RSE concluded that consideration of these issues would best be addressed jointly between the committees, so that both technical and legal aspects and questions of liability are taken into account, while keeping in mind the different purposes and functions of conventions under the purview of LEG and those under MSC.[36]

Further, the LEG Committee concluded that the *United Nations Convention on the Law of the Sea* (UNCLOS) must be evaluated in connection with further study of the four degrees of autonomous and remotely controlled ships.

[36] IMO, Legal Committee, 108th session (LEG 108) (July 26-30, 2021), https://www.imo.org/en/MediaCentre/MeetingSummaries/Pages/LEG-108th-.aspx.

CONCLUSION

The emergence of autonomous and remotely controlled vessels is an exciting development in the shipping industry. The technological advances will utilize green energy and promote safety in the global commercial shipping industry. But, as with all technological advancements, international laws as well as the United States must be amended, and new laws must be enacted to address the challenges of autonomous shipping.

SHOULD CANADA DITCH THE SWITCH? INTERSWITCHING AND CANADIAN RAIL POLICY

By Mary-Jane Bennett, B.A., L.L.B.[1]

INTRODUCTION

Interswitching is the industry term for something federal law mandates rail companies do in Canada: Transfer freight from one railway to another. Rail carriers are required to do this any time a shipper requests it (so long as the request falls within current rules). Generally, shippers do this to access cheaper freight rates from a competitor. Railways must swallow the costs associated with these below-market rate transfers and traffic; they cannot decline the request.

While rail companies were limited to making short-haul exchanges, the federal Liberal government recently chose to substantially expand the interswitching law. Canadian rail carriers are now required to make these transfers over longer distances. The new law has made the practice cumbersome and costly for Canadian rail companies. These transfers tend to eat up considerable resources, impacting the fluidity and efficiency of networks overall.

While the federal government requires Canadian railways to transfer freight back and forth this way, the United States does not. While the practice—known there as "reciprocal switching"—is currently under review, Washington has never required its rail companies to make these money losing, wasteful transfers.

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This paper will consider Canada's long history of regulating freight rates, particularly for agricultural commodities. It will outline how regulatory rates have tended to slow technological advances, reduce efficiencies, and hinder economic growth for railways. It will further examine whether the current rates paid to the railways for the transfers are "compensatory" and "commercially fair and reasonable," as the *Canada Transportation Act* requires. It will assess whether the new provisions meet the demands of Canada's National Transportation Policy statement. The Act stipulates that "competition and market forces" should be the "prime agents in providing viable and effective transportation services." It says that the federal government should exercise extreme caution when enacting new laws or regulations, particularly those that risk interfering with the prioritization of a commercial transportation system. The Act makes clear that the government's regulatory powers should only be used in the rare instances when market forces and competition cannot meet Canada's aim of a "competitive, economic, and efficient" transportation system.

This paper will conclude that the new long-haul interswitching provisions introduced by the Liberals risk entrenching additional regulations in a system already burdened by significant red tape and uneconomic directives. At a time of record demands on the supply chain, lengthy and frequent transfers are creating backlogs, additional regulatory red tape and freighting delays. They are interfering with the fiscal health of Canada's two Class I rail companies, the Canadian National Railway (CN) and the Canadian Pacific Railway Inc. (CP) while benefitting certain shippers. It will conclude that a fairer, more equitable system that benefits all partners in the supply chain is possible.

I. BACKGROUND

Canada's rail networks contain some interconnected lines, severally owned by one or the other of the country's two Class I rail carriers: the CN and its long-time rival, the CP. In some places, however, destinations and origins were and are served by a single railway. Before the introduction of the interswitching measures, some companies that ship to and from these

destinations complained they were physically limited to a single rail carrier. They argued that they should be entitled to access to the lines of other rail carriers. Beginning in the early 1900s, laws were enacted to do just that.

When the practice was begun in Canada, however, creating competitive pressures was not the goal. In the days before trucks, airplanes and cars, rail was the most efficient way to move goods over land. The idea behind interswitching was to try to slow the construction of new track, especially in and around cities, where land was growing scarce. The government of the day recognized that if shippers were given access to existing rail lines, new lines wouldn't need to be built, preserving land surrounding cities for industry and housing.

Beginning in 1904, new federal laws obligated railways to provide competing carriers access to their lines a maximum of 6.4 kilometres to an interchange (four miles under the imperial system in place at the time). To this day, the CN and the CP continue to regularly contract with one another, transferring goods between lines this way.

The way interswitching works in practice is that one railway will take a shipper's freight partway from origin towards destination, then hand it over to a competing railway for transit on its line. The competitor will deliver the freight on the next leg of its journey. The transfer, or switching, is done at an interchange—a place where the lines of the two railways meet.

Voluntary exchange interswitching between railways has increased efficiencies throughout the supply chain, helped streamline operations and ease well-known snarl-ups at the export terminals within the Vancouver Fraser Port Authority (hereafter, the Port of Vancouver).

While voluntary exchange switching agreements increase efficiencies, when interswitching is forced, railways complain that they lose the ability to price carriage fees. Generally, carrying goods at a regulated rate leads to losses. In this system, gains tend to flow primarily to the terminal carrier and to certain

shippers, to the detriment of the host railway and other partners in the extensive supply chain.

II. HOW ARE INTERSWITCHING RATES SET

Murdoch MacPherson, Chairman of the revolutionary 1961 Royal Commission on Transportation (known as the MacPherson Commission) which examined regulated freight rates, said that Canada has a tendency to treat the rail industry differently from other industries. Railways, he wrote had become "an instrument of national policy" which "was now turning out to be an albatross around their neck."[2]

The government responded to the MacPherson Commission's 1961 report by passing a new *National Transportation Act*, whose principles—the need to reduce regulatory control and the payment of reasonable compensation for government-imposed demands on transport operators—reflect the commission's lasting influence. This set Canada on a path to deregulation. MacPherson said the earlier regulatory era had led to the railway industry being required to serve "two masters," each one in conflict with the other. The rail industry had become both "an instrument of national policy" and a vehicle of private venture operating along the lines of commercial purpose.[3]

Since the 1960s, switching rates were originally set and regulated by the National Transportation Agency, a federal transportation tribunal created in response to the MacPherson Commission. In 1996, jurisdiction was transferred to its replacement body, the Canadian Transportation Agency (CTA), who has since acted as the regulator and decision maker on federally regulated transportation matters. According to the CN Submission to the 2015 Canadian Transportation Act Review, interswitching rates set by the CTA have been low,

[2] *Royal Commission of Transportation* (1961), Vol. I, at 11.

[3] *See id.*

roughly half, the deeply discounted rates rail companies currently receive for shipping grain in Canada.[4]

When ratemaking, the CTA is required to consider a rate based on the average variable cost of the movement. It must further consider (1) any reduction in costs incurred by moving a greater number of cars or transferring several cars at the same time, and (2) the long-term investment needs of the railway.

Canadian railways complain that this system undermines their ability to price their services differentially based on demand; and it lessens their ability to earn enough revenue to invest sufficiently in their networks. Further, transferring goods on an interchange reduces rail car availability, impacting capacity, efficiencies, and speeds throughout the rail network. (This costing system will be examined in further detail in a section determining whether transfer rates are "commercially fair and reasonable.")

For decades after interswitching was introduced, measures governing its use remained largely unchanged. Its use was comparatively limited, and railways engaged primarily in exchange or voluntary interswitching. The first major change to the system was introduced in 1987. The *National Transportation Act*, tabled by the Conservative government of Prime Minister Brian Mulroney, increased interswitching moves that a shipper could access from 6.4 to 30 kilometres (km). This was done to reflect the reality of sprawl within Canada's large urban centres. The 30-km radius is typically the distance from which a local train assignment gathers the traffic at origin or distributes it at destination. The rail yards are typically the interchange point between the two carriers. Anything beyond is considered challenging from the standpoint of supply chain efficiency and railway operations.[5]

[4] Submission to the Canada Transportation Act Review, by Canadian National Railway, Mar. 10, 2015, at 20.

[5] *See CN Submission to the 2015 Canada Transportation Act Review*, Mar. 2015, at18.

Because the expansion confined interswitching to a 30-km radius from origin or destination, the increase was in effect a yard move. As a result, railways considered the expansion, while time-consuming, relatively benign.

III. 'THE WINTER FROM HELL'

The next major change to rail policy came in 2015, on the heels of three major events: the shuttering of the Canadian Wheat Board, a bumper crop so enormous that grain companies ran out of room to store it, and the winter of 2013-14, one of the coldest on record. These three factors combined to create massive headaches for Canadian railways and significant shipping delays throughout the supply chain.

In the fall of 2014, harvest totals reached an unprecedented 81.9 million metric tonnes, more than 40 per cent higher than the five-year average for Western Canada.[6] By November, however, railways were still meeting delivery targets, despite the mountains of grain they were moving, according to the Quorum Corporation, Canada's grain monitor. It noted that month that deliveries to port were "high compared to previous years."[7]

But this was just the beginning of one of Canada's coldest winters, the 'winter from hell,' as it became known, when temperatures hovered at minus 30 degrees Celsius in the prairie provinces for months. Rail companies were forced to run shorter, slower trains, reducing average speeds by one-third to maintain safe operations. The railways' pneumatic braking systems—which can leak air in extreme cold—were a notable concern. Slowing trains to this extent, however, decreases line capacity by "half, if not more," studies by the

[6] *The 2013-14 Crop Year: Performance of the Grain Handling and Transportation System in a Challenging Time*, Quorum Corp., June 3, 2016.

[7] *Id.*

U.S. Department of Agriculture have shown.[8] The results were devastating, though necessary, system-wide delays.

This was also the first crop year following the 2012 dismantling of the Winnipeg-based Canadian Wheat Board (CWB), the centralized marketer for wheat and barley in Western Canada. Grain shipments were no longer centrally co-ordinated, and farmers and grain companies had difficulty harmonizing shipping schedules with the sudden move to a commercial system. Further, a problem that had been allowed to develop under the CWB system created significant headaches that fall and winter.

Years-long underinvestment in grain storage capacity meant that by 2013, the combined commercial elevator capacity in Canada was no more than 20 per cent of average annual production, a subsequent review determined. The review noted that the United States, by contrast, has capacity for more than 50 per cent, and Australia has storage for 175 per cent.[9] The lack of grain storage forced a reliance on just-in-time delivery, putting undue pressure on railways, the report concluded. Despite the abundance of problems impacting the supply chain that winter, railways had become a "convenient and familiar target," the *Winnipeg Free Press* noted, in an article highlighting the long list of reasons for delivery delays in 2013-14.[10]

By January of 2014, the country's grain farmers, many of whom had harvested record crops that fall, had grown frustrated with shipping delays. Powerful farming and agriculture lobbies were pushing the Conservative government—whose base of power is centred in Western Canada—to intervene. Just as the spring thaw began on the prairies, and railways began moving grain more quickly to port, the Conservative government of Prime

[8] *Rail Service Challenges in Upper Midwest, 2013-14*, United States Department of Agriculture, at 14.

[9] David Emerson, Canada Transporation Act Review, *Pathways: Connecting Canada's Transportation System to the World*, Vol. 1, at 157 (2015), https://tc.canada.ca/en/corporate-services/acts-regulations/canada-transportation-act-review-report.

[10] *Grain Glut Needs Total Solution*, Winnipeg Free Press, Apr. 10, 2014.

Minister Stephen Harper tabled a two-part law, which aimed at assuring grain deliveries.

The first part of the new legislation, which had the working title *The Fair Rail for Grain Farmers Act*, imposed grain delivery quotas on rail companies. The CN and the CP each faced daily fines of $100,000 if they didn't each haul 536,250 tonnes of wheat, canola and other crops each week from August 3 to November 29.

The law's second section increased geographic interswitching rights by more than fivefold—from 30 to 160 kms. The move was seen by industry analysts as the most significant change to rail policy in Canada in decades. It came without "analysis of the changes, the conditions requiring them, how changes fit into the larger picture of available shipper remedies or alternative options," according to a 2015 report by CPCS, an international infrastructure development firm.[11]

The trade group that represents Cargill, Viterra, and other major grain companies welcomed the new law. "Key for us is knowing what's going to move and making numbers we can plan for and sell to," said Wade Sobkowich, executive director of the Western Canadian Grain Elevator Association.[12]

The CP noted, however, that the increased interswitching distance represented a catchment area of 28 times the size that existed previously. For the CN, the change required the rail company to open up as much as 73 per cent of its rail cars to competitor railways (their calculation excluded intermodal

[11] *Canada — United States Freight Rail Economic Regulation Comparison*, André Pretto & Joseph F. Schulma, presented to the 50th Annual meeting of the Canadian Transportation research Forum, May 2015, at 14.

[12] *Railways say Ottawa's extension of grain shipment quotas ill-advised*, Globe & Mail, Aug. 1, 2014.

freight transport, that makes up roughly 25 per cent of its business).[13] They called the new law a "burdensome and ill-advised regulatory intervention."[14]

Critics noted that expanding the interswitching radius to 160 km not only required rail companies to put in place bigger crews and larger locomotives, it also impaired long-term investment planning. The CN's Chief Executive Officer Claude Mongeau said at the time that the new law could ultimately undermine investment in the rail sector, noting that the move had already forced the company to reconsider a planned, new major investment in the Port of Vancouver.

Yet a certain degree of uncertainty surrounded the Conservative policy choice. First, the Bill carried a highly unusual sunsetting clause, which allowed the new law to expire on August 1, 2016.

This timeline meant that the findings of a mandatory review of the new legislation would be issued before the sunset clause was triggered. (The *Canadian Transportation Act* requires the Transport Minister to appoint a Review Panel to gather evidence, report on how Act is working, and propose amendments to Parliament any time significant changes to it are made. This is done to both update the Act and to ensure that new legislation is consistent with National Transportation Policy.)

There seemed to be a reluctance by the federal government to take ownership of their new law. Rather than clearly establishing the law's parameters, the Transport Minister opted to have the CTA issue new interswitching regulations, a highly unusual process. Handing over the workings of interswitching to the CTA on a policy of this magnitude suggested

[13] CP: *Facts About Bill C-30* (CP); CN: *CN Submission to the Canadian Transportation Act Review* (Mar. 10, 2015), at 21.

[14] *Ottawa Hails New Rail Shipping Regulations, Says Farmers to Benefit*, The Canadian Press, Aug. 1, 2014 (quoting CN chief executive officer Claude Mongeau).

to analysts that the government was not entirely comfortable with its policy choice.

This also led to confusion. The CTA claimed on its website that it was "required" to issue new interswitching regulations. But the expansion of new interswitching distances envisioned by the Conservative government had the result of forcing the CTA to break with its previous stance on the issue. Extending the 30-km radius would "have substantial repercussions in the rail transportation industry," the CTA said in a 2004 statement. The impact of increasing the radius beyond the 30 km would be "so significant that such an amendment cannot be contemplated by way of a regulatory change."[15] In 2010, the CTA reiterated its view that interswitching radiuses should not be extended, noting that its fundamental goal is to reduce "rail line congestion in urban area" and provide "competitive opportunities for shippers."[16]

The passage of the amendments to the *Canada Transportation Act*, and the launch of the Canada Transportation Act Review (hereafter, the 2015 CTA Review) occurred almost simultaneously. The 2015 CTA Review was chaired by David Lee Emerson, an economist and former Conservative MP for Vancouver Kingsway. Mr. Emerson's two-volume report, *Pathways: Connecting Canada's Transportation System to the World*,[17] was tabled in Parliament on February 25, 2016. Emerson recommended abandoning the Conservative government's interswitching policy, suggesting the new 160-km radius should be allowed to expire on the sunset date of August 1, 2016.

In his report, Emerson concluded that the increased interswitching radius—with a fee structure derived from system-wide average costs—meant that railways would receive the same rate for transferring the goods regardless of where the move occurred, what the market conditions were, and whether compensation provided to them was sufficient. Emerson wrote that this was

[15] CTA: Regulatory Impact Analysis Statement, Sept. 23, 2004.

[16] CTA, Decision: LET-R-66-2010, at 12.

[17] *See Pathways, supra*, note 9.

inconsistent with Section 112-113 of the *Canada Transportation Act*, which requires freighting rates to be "commercially fair and reasonable." Rates should be compensatory rather than the current unfairness in rate calculation,[18] he concluded. "If the extended 160 km interswitching limit were applied to all commodities in all provinces," he added, "regulated freight rates could potentially apply to the vast majority of rail traffic in Canada."[19]

Mr. Emerson's report was in line with two earlier Transportation Act reviews on the subject. One, completed in 2001, for the Liberal government of Prime Minister Jean Chrétien, found that extending the 30-km transfer radius would "worsen the market-distorting aspects of the interswitching rate regime and would be a step backward."[20] The 2001 panel expressed concern that extending exchange distances would slow the move towards a partially deregulated railway transportation system: "Government should be involved in regulating commercial relationships only when one party is abusing monopoly power."[21]

Three years later, a second review on the topic concluded that extending the interswitching radius "would have substantial repercussions in the rail transportation industry and the magnitude of these repercussions would be so significant that such an amendment cannot be contemplated by way of regulatory changes."[22]

When tabling the 2014 legislation, the Harper government did not seem to recognize that the confluence of factors that led to the shipping delays—an unprecedented harvest, a prolonged, extreme cold snap, and the closure of the CWB—were not likely to converge again in this way. This was a one-time triple threat. This became clear shortly after the law was enacted. Despite the

[18] *See id.*, Vol. 1, at 163.

[19] *Id.* at 164.

[20] *Vision and Balance:* 2001 Canada Transportation Act Review, June 2001, at 63.

[21] *Id.*

[22] Canada Gazette Part II, Vol. 138, No. 20, Oct. 6, 2004, at 1417.

previous fall's enormous bumper crop, the railways had delivered the glut of grain to port by July 31, 2014. Grain companies earned a $2-billion windfall, it was noted in a joint report by the University of Saskatchewan and the University of Manitoba's Department of Agriculture and Agribusiness.

A functional supply chain, focused on the planning and efficient delivery of goods and services, requires sound and structured investment decisions throughout the network. To succeed, each partner in the chain is reliant on the other partners. Multiple federal reviews of the issue all concluded the same thing: Increasing rate regulation through the expansion of interswitching distances had the potential to deal crippling blows, not just to rail carriers, but the network as a whole.

IV. TRANSPORTATION MODERNIZATION ACT (2018)

By the time Emerson's report was issued in February of 2016, the Conservative government had been replaced by Prime Minister Justin Trudeau's Liberal government. On June 16, 2016, Marc Garneau, Minister of Transport and Lawrence MacAulay, Minister of Agriculture announced that the federal government was extending the Conservative law, to give officials time to fully review and assess Mr. Emerson's findings.

As the federal Liberal government began considering Mr. Emerson's report, a corollary concern emerged: the derelict state of the country's grain fleet. At the time, almost 50 per cent of grain cars were owned by the Government of Canada, not railways. Regulations deterred rail companies from adding new cars to the fleet. The aging grain fleet was a motley mix, with five different car types with four separate cubic dimensions, and a range of different total weights. Roughly half the cars were 50 years old, or more. Furthermore, the fleet's older cars were unable to adjust to loop track mechanization, a modern grain handling system trackage that allows cargo to be unloaded as the train moves, hastening supply chain movement and efficiency. This was leading to major bottlenecks at port.

At the time, federal legislation only allowed railways an offsetting benefit for new hopper car purchases with two provisos. First, the benefit for a new car purchase had to be shared with its competitor rail company and second, the purchase of a new car was only allowed when the federal government's car was deemed unusable. To access the federal offset, railways were limited to replacing aging hopper cars, and not easily to expand, or modernize the fleet. The result of these regulations was severe underinvestment in the country's grain fleet. By 2013, Canada's hopper fleet was deemed "quite defective," according to the Transportation Safety Board's former Director of Derailment, Ian Naish.[23] Steve Pratte, policy advocate for the Canadian Canola Growers' Association deployed more colourful language to describe it. Mr. Pratte labelled the fleet a "a dog's breakfast—duct-taped together, and on its last legs."[24]

While previous governments had done little to remedy long-standing infrastructure deficits like these, the incoming Liberal government recognized that running trains interspersed with aging cars on mountain routes during winter months was creating significant hazards.

In May of 2018, the federal Liberal government chose to address rail car deficits, freeing rail companies from the regulatory barriers that limited their purchase. The new legislation also repealed the grain delivery mandate the Harper government had imposed on the two Class I carriers.

The law also corrected a long-standing problem that had worked to prevent port efficiencies. To move grain more quickly through Vancouver's port and to reduce rail car snarl-ups at its export terminals, rail carriers had concluded a series of co-ordination initiatives whereby the CN would move traffic to Vancouver Port's north shore through its network and the CP would move traffic to the port's south shore through its network. This resulted in the CN moving more grain cars on its network and attracting penalties for having

[23] *Brake Defects Plague Canada's Aging Grain Cars*, Railway Age, May 15, 2020.

[24] *Who Will Replace Western Canada's Aging Grain Hopper Cars?* Alberta Pulse Growers, Mar. 28, 2017.

exceeded its grain tonnage under the *Canada Transportation Act*'s regulatory formula for grain movements. The new law put an end to that inequitable situation.

However, the most dramatic change introduced by *The Transportation Modernization Act* (later subsumed by the *Canada Transportation Act*) was the expansion of interswitching limits. With the Act, the federal Liberal government chose to significantly expand the interswitching radius by introducing a new practice known as "long haul interswitching" (LHI). As it is defined in s. 129 of the *Canada Transportation Act*, LHI allows the carriage of traffic of up to 1,200 km, or 50 per cent of the total number of kilometres, whichever is greater. It can be triggered where a shipper is dissatisfied with a rate or manner in which the railway company is fulfilling its service obligations. The legislation bars exchanges from two high-density regions: in the east, the Quebec to Windsor corridor and in the west, the Vancouver to Kamloops corridor. Certain freight is also excluded, including vehicles, toxic and radioactive materials, flatcars, containers, and trailers.

The CTA performs two functions. It is an administrative and quasi-judicial tribunal with most of the powers and responsibilities of a Superior Court and resolves disputes between federally regulated transportation providers and those with whom they interact. It is also responsible for the economic regulation of carriers under its jurisdiction. In this second role, it sets interswitching rates. It also determines routes when shippers request exchanges. (In so doing, it considers the shipper's desired route, but does not confer with the rail carrier.)

As previously noted, the CTA sets regulated interswitching and grain freighting rates. The rate-setting exercise for both is completed annually. Following the introduction of the new interswitching legislation, the CTA established three rating zones within the 30-km radius, with different rates for each. Additional zone 4A covers movements between 30 and 40 km; Zone 4B those more than 40 km from the interchange as measured by railway track.

When setting rates, the CTA uses a regulated weighted cost of capital rate determination, where the cost of debt and the cost of equity are weighted to its component parts. The CTA has also given notice that it will consider a "productivity adjustment," which it says will be used primarily to correct "forecasting errors."[25]

Further, section 136(1), grants the CTA the right to determine the "continuous route" from origin to destination, having regard to "the route chosen by the shipper in its application." Rail carriers are however not consulted by the CTA when it sets freighting transfer routes.

Additionally, the CTA acts as a tribunal when conflicts arise. In a series of decisions over the past decade, the CTA has made the following determinations.[26] These amount to a series of binding guidelines governing interswitching in Canada:

Connecting carriers do not need to own a railway line; operating rights on the line are sufficient.

An interswitching rate can be granted even when the movement is covered by confidential contract.

To obtain an interswitching rate, there is no need to demonstrate proof of an unsatisfactory service or competitive disadvantage.

While distance is the "main factor" in any interswitching request, service issues and competitive position may also be considered but will not be accorded the same weight as distance.

The level of service of interswitching is equal to that governing other traffic. Rail companies are therefore expected to make the necessary

[25] Determination No. R-2020-194 ¶ 67.

[26] CTA Decisions: R-2020-194; 165-R-2013; CONF-15-2018.

investments in infrastructure supporting interswitching to ensure they meet these legal obligations.

V. HOW THE CTA DETERMINES INTERSWITCHING RATES

As previously noted, Canada's deregulated rate system originated in the 1960s, following a recommendation to that effect by the MacPherson Commission. The CTA nonetheless retains jurisdiction to set fees for two rate-regulated shipments under the Act: It establishes the ceilings on regulated grain rates and the fee for interswitching. The CTA is mandated to ensure that rail companies are appropriately compensated for these services.

In setting interswitching rates, the tribunal uses a regulated cost of capital rate determination. In this system, the cost of debt and the cost of equity are weighted to their component parts.

The weighted average cost of capital (WACC) is the measure of opportunity cost; that is, what investors could be earning if their funds had been committed to an alternative project of similar risk. It is calculated using what is known as the Uniform Classification of Accounts System.

In 1997, in what is called the "transition case," the CTA incorporated its earlier cost of capital methodologies into the new 1996 *Canada Transportation Act*. As a result, the guiding principles in cost of capital determinations were the following:

1. That the return on equity should be sufficient to cover the costs of interest on debt, taxes and a return to equity investors. (Reasons for Order R-6313, 1969).
2. That the rate of return to investors should be sufficient to attract new capital. (Royal Commission on Transportation, 1961).
3. That the rate of return on equity should be greater than that on debt, in general, due to the relatively greater amount of risk that is assumed by the equity investor. (Reasons for Order R-6313, 1969).

4. That users of railway services should not be charged a cost of capital for assets that are not required for continued rail operations. (Reasons for Order R-6313, 1969).

While these guiding principles were carried forward to the new Act, they have been weakened by subsequent CTA determinations. The CTA considers the cost of debt as relatively straightforward. It looks solely to the weighted rates of interest paid in its various debt instruments. The Agency's choice of cost of debt, it says, is beyond its "focus" in LHI determinations as it remains governed by those earlier cost of capital decisions.[27]

The WACC's second element, the cost of equity, is a projection of what is considered to be "a reasonable rate of return on shareholders' investment." There are three models from which the CTA can estimate the cost of equity: the Capital Asset Pricing Model (CAPM), the Discounted Cash Flow (DCF) and Equity Risk Premium model. As recently as 2004, and again in 2017, the Agency has given "primary weight" to the CAPM method.[28]

In its determination of the cost of equity, the CTA's has chosen a railway company's book value as its standard, as opposed to market value. The result is that rates are kept artificially low. The Agency's after-tax estimate of cost of equity continues to be so low that the cost of equity is basically equal to the cost of debt.

Furthermore, its choice of book value is inconsistent with the Supreme Court of Canada's 1929 decision in *Northwestern Utilities Ltd. v. Edmonton (City).*[29] There, the court stipulated that a "fair return" for a regulated utility is one that is "as large" as an investor would receive when investing in another enterprise of equal "attractiveness, stability and certainty." This standard has

[27] Discussion Paper on the CTA Approach to Setting Regulated Interswitching Rates, at 12.

[28] CTA Decision of February 2, 2004: Re.: Issues related to the Canadian Transportation Agency's determination of cost of common equity rates for regulated railway companies, File No. T-6275-1-1 at 3; Decision 20017-R-198.

[29] *Nw. Utils. Ltd. v. Edmonton (City)* [1929] 186 at 193.

been considered appropriate, as recently as 2015, for cost of capital determinations by the Alberta Utilities Commission.[30]

After all, investment decisions are based on scrutiny by the investor of the company's potential earning capacity and the level of investment risk it carries. Investment decisions are not determined by reference to a company's book value.

Further, the methodology used in calculating rates is based on system-averages, rather than on the actual cost to railways of these railway transfers. Fees are calculated this way because the CTA is unable to determine the true cost of movement for the transfer.

Finally, the costing methodology itself, developed in an earlier era—prior to containerization and when train lengths averaged 40 cars—is not without controversy. The Uniform Classification of Accounts is intended to define a railway's variable cost by dividing expenses into categories and defining units by car type, system size and length of haul. It contains numerous judgment calls on certain cost relationships (such as the percentage of a railway's expenses that should be treated as variable based on traffic levels).

By its nature, the methodology cannot determine increases in costs relative to specific shipments. For example, it cannot differentiate between a move on a flat prairie grade with more challenging, steep grade moves. Nor can it distinguish between the relatively low cost of interswitching in remote locales from those in high density areas, which tends to bring down "the average." The methodology is also unable to distinguish between operations of heavy unit trains, multimodal through trains and scheduled trains.[31] Nor do

[30] *See Alberta Utils. Comm'n 2013 Generic Cost of Capital*, 2191-D01-2015.

[31] *Observations on Rail Costing in Canada*, Mike Tretheway, Robert Andriulaitis and Jody Kositsky, presented at the 54th Annual Meeting of the Canadian Transportation Research Forum, May 2019, at 4.

pricing mechanisms consider mechanization, rail car efficiency and other productivity enhancing tools linked to technological advance.

Critics such as Mike Tretheway, former Chief economist with InterVISTAS, complain that Canada's freighting rate classification system is stuck in the era "when railways were dinosaurs compared to today."[32] In *Observations in Rail Costing in Canada*, he claims that Canada's cost of capital costing is "archaic" and "simplistic" and "based on the bygone era of steam and manifest train operation."[33]

VI. ARE CURRENT INTERSWITCHING RATES "COMMERCIALLY FAIR AND REASONABLE"?

Section 112 of the *Canada Transportation Act* stipulates that interswitching rates paid to railways must be "commercially fair and reasonable." It follows that if a rail company carries more traffic over longer distances, the fee it receives should reflect this. As previously noted, the fee structure does not remunerate rail companies in this way because the cost of capital formula is unable to replicate the marginal cost of a movement. Because the methodology used in calculating rates is based on system-averages—and not the actual cost to railways of these transfers—it is difficult to reconcile the current fee structure with the Act's requirement that a rate be "commercially fair and reasonable."

The CTA, which acts as federal regulator in determining the interswitching rates, has claimed on several occasions that regulatory system-average costing meets the requirement of Section 112. The current regulated formula "allows companies to earn a reasonable return while protecting shippers from excessive (railway) fees," the CTA wrote in a Discussion Paper

[32] *Id.* at 2.

[33] *Id.*

on interswitching rates.[34] The CTA further claims that system-average costing for both fixed and variable costs amounts to "an approximation of Ramsey pricing."[35]

Data, however, has shown that rates have not been increasing year over year. A 2014 study by CPCS, an international infrastructure development firm, found that average freight rates in Canada declined by 33 per cent between 1988 and 2013.[36] The 2015 CTA Review, chaired by David Emerson noted that: "average freight rates in Canada . . . are among the lowest in the world."[37]

In defining terms, such as "commercially fair and reasonable", Canadian courts have agreed that generally words must be construed according to their plain, ordinary and popular meaning, unless, in respect of the subject matter, the words have "acquired an understanding distinct from the popular sense of the words . . . or in some other special or peculiar sense."[38] The word "commercial,",the Alberta Supreme Court found, "conveys to the mind the idea of dealing or trading in some article of commerce."[39]

Other cases consider railway operations as a commercial trade involving the carriage of goods for profit. In *Great Western Railway. v. Sutton*, L.R. 4 H.L. 226 at 237, the House of Lords wrote that: "The obligation which the common law imposed upon [a common carrier of goods] was to accept and carry all goods delivered to him for carriage according to his profession (unless

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[34] Discussion Paper on the CTA Approach to Setting Regulated Interswitching Rates, Issue 4, at 10.

[35] *Id.*

[36] *Evolution of Canadian Railway Economic Regulation and Industry Performance under Commercial Freedom*, CPCS, Ref.: 13381, Nov. 28, 2014, at 33.

[37] *Pathways, supra*, note 9, Vol. 1 at 118 (internal footnote omitted).

[38] *Robertson v French*, *(*1803) 4 East 130.

[39] *Ronaghan v. Can. W. Ins. Co.*, Alberta S.C., 22 WWR 337, per Greschuk J.

he had some reasonable excuse for not doing so) on being paid a reasonable compensation for so doing."[40]

In what is considered the key point of reference on any question of level of service obligations, the Supreme Court of Canada noted that railroading is, above all, a commercial enterprise, writing:

> [A railway's] financial necessities are of the first order of concern and play an essential part in its operation, bound up, as they are, with its obligation to give transportation for reasonable charges. Individuals have placed their capital at the risk of the operations; they cannot be compelled to bankrupt themselves by doing more than what they have embraced within their public profession, a reasonable service.[41]

The above noted cases suggest that "commercially fair and reasonable" should be understood in the context of the *Canada Transportation Act* as structured with a business or profit-making motive, not one designed for regulatory costing. The current interswitching fee structure, which averages costs on a cross Canada system-wide basis, runs counter to that aim.

The word "commercial" and the term "commercially fair and reasonable" are cited four other times in the *Canada Transportation Act*:

(1) Section 120.1 (4): (regarding freight tariffs) Any charges or associated terms and conditions established by the Agency shall be **commercially fair and reasonable** to the shippers who are subject to them as well as to the railway company that issued the tariff containing them.

(2) Section 139(1): The Governor-in-Council may request two or more railway companies to consider the joint or common use of a right-of-way if the Governor in Council is of the opinion that its joint or common

[40] *Great W. Ry. v. Sutton*, L.R. 4 H.L. 226 at 237.

[41] *Patchett & Sons v. Pac. Great E. Ry. Co*. [1959] SCR at 271.

use may improve the efficiency and effectiveness of rail transport and would not unduly impair the **commercial** interests of the companies.

(3) Section 144 (6): regarding the commercial transfer of railway lines: on complaint in writing by the interested person, the Agency finds that the railway company is not negotiating in good faith and the Agency considers that a sale, lease or other transfer of the railway line, or the company's operating interest in the line, to the interested person for continued operation would be **commercially fair and reasonable** to the parties, the Agency may order the railway company to enter into an agreement with the interested person to effect the transfer and with respect to operating arrangements for the interchange of traffic, subject to the terms and conditions, including consideration, specified by the Agency.

(4) Section 169.38 (1) (c): The arbitrator's decision must be **commercially fair and reasonable** to the parties.

In each of the above noted cases, the word "commercially" is used in its common and ordinary sense and meaning, that is, relating to a profit-making undertaking or venture. When taken together with the inherent failings of a cost-based system as described in the previous section, the rates cannot, under any definition, be considered "commercially fair and reasonable."

When considering the effect that the interswitching fee structure has had on the rail industry, it is instructive to consider the success of railway rate deregulation. As previously noted, the move to deregulation began in earnest in the 1960s, with changes largely spurred by the MacPherson Commission. Deregulatory moves helped put the rail industry on a more secure footing by allowing rail companies, for example, to access long-term investments. This helped them better respond to external shocks, whether to changes in demand, routing, or climatic events. Rail carriers were not the only beneficiaries of deregulatory moves. Shippers continue to receive pass-throughs on savings in the form of lower rates. Deregulation remains today the foundation of the *Canada Transportation Act*.

This was noted by David Emerson in his report on the 2015 CTA Review. Emerson wrote "productivity growth," spurred by deregulation, leads to "[i]mprovements in railcar design, locomotive power and efficiency, and track design."[42] He noted that capital investment is linked to "the adoption and diffusion of new technologies—another potential sources of productivity improvement, often with collateral benefits in terms of environmental and safety performance."[43]

In 1967, the *National Transportation Act* was amended to include a statement reflecting the National Transportation Policy. It remains the foundational policy defining the purpose of transport policy in Canada and stipulates in brief that "Canada is best served by an economically efficient transportation system, and that the best way to achieve this is to rely as far as possible on market competition."[44]

VII. DO INTERSWITCHING RATES SATISFY RAILWAYS' LONG-TERM INVESTMENT NEEDS?

Section 127.1 (2) (b), of the Canada Transportation Act requires the CTA to consider "any long-term investment needed in the railways," when setting freighting rates.

While Canadian railways are profitable on the long-haul portion of a given movement and able to cover their company's fixed costs, the new LHI has resulted in Canadian railways moving traffic the short distances and then transferring the cars to a U.S. railway. Without trackage in the country, the U.S. carrier will, by necessity, become the long-haul carrier. Canadian railways will therefore obtain less revenue to invest in their networks. When considering the Canadian rail industries' long-term investment needs, it is relevant that U.S.

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[42] *Pathways*, *supra*, note 9, Vol. 1 at 127.

[43] *Id.*

[44] *Comparison of Canadian and United States Rail Economic Regulations*, Joseph F. Schulman, at 147.

railways have comparatively higher degrees of traffic density (measured as trains-per-day or gross-ton miles per year). This means that U.S. railways have more traffic over which to spread the high fixed costs of maintaining their networks.

For interswitching rates to satisfy the requirement that they meet the rail companies' long-term investment needs, rail carriers argue this requires that the return to investors be the equivalent of a market return. After all, a 2006 Report by the Government Accountability Office in reply to a Congressional request, notes, rail investment "involves private companies taking a significant risk which then becomes a fixed cost on their balance sheets, one to which they are accountable to shareholders and for which they must make capital charges year in and year out for the life of the investment." The Government Accountability office concluded that a railway contemplating an investment "must be confident that the market demand for that infrastructure will hold up for 30 to 50 years."[45]

While Canadian railway companies argue that the current costing system (which uses cost of capital methodology) provides a disincentive to investment, the CTA takes the opposite view. Regulated rates serve to ensure that railway companies do not "overinvest or underinvest in their networks,"[46] wrote the Agency dismissing the CN's argument on the point.

In effect, the CN argument is pitting a market approach for interswitching freight rates (which is preferred by both Class I rail companies in Canada) against the CTA's preference for the current approach.

The chasm between the two positions serves to highlight a weakness in the Canadian accounting method. As discussed in the previous section, in determining the capital structure, the CTA uses book value (the value according

[45] *Freight Railroads: Industry Health Has Improved, but Concerns about Competition and Capacity Should be Addressed*, Government Accountability Office, GAO-07-94, Oct. 2006 at 56.

[46] Discussion Paper on the CTA Approach to Setting Regulated Interswitching Rates, Issue 4: Long-term investment needs of the railway companies.

to the company's balance sheet) rather than market value (the valuation based on a company's stock price and outstanding shares). The difference in tax considerations between book value (used in Canada) and market value (used in the United States) creates results that differ widely.

Joseph F. Schulman, a well-known railway economist and principal consultant with CPCS wrote that: "Due to the different methodologies used, the resulting estimates differ widely, for example 11.32% on an after-tax basis for U.S. railways in 2013, versus estimates in the neighborhood of 6%-7% on a pre-tax basis for CN and CP."[47] The cost of equity in Canada yields "significantly lower estimates" which have been "eroding over time while remaining stable in the U.S."[48]

David Emerson's 2015 CTA Review acknowledged the wide gap between the two methods. Emerson concluded that railway operations in Canada face a higher effective cost of capital investment with capital cost depreciation in the United States "as much as five times higher for a given class of asset."[49]

David Emerson's 2015 CTA Review also concluded that the tax differences that burden Canadian railways compared to their larger American counterparts are key issues in any determination on the long-term investment needs of railways. Emerson noted that it will ultimately affect the extensive supply chain and the many industries that rely on the financial health of the railway for their growth and success. He further stated that "it creates the risk that railways in Canada will not be able to maintain the same pace of capital investment as its competitors in the United States."[50]

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[47] CPCS, *Comparison of Canadian and United States Rail Economic Regulations*, Joseph F. Schulman, at 137 (Jan. 20, 2015).

[48] *Id.*

[49] *Pathways, supra*, note 9, Vol. 1 at 127.

[50] *Id.*

VIII. NATIONAL TRANSPORTATION POLICY: A COMPETITIVE, EFFICIENT AND SAFE RAILWAY SYSTEM

A. "COMPETITIVE" RAIL SYSTEM

The 1967 *National Transportation Act* overturned the earlier era that regulated railway's transit pricing. Government interference with the way railways price had led to an almost bankrupt railway system. By 1917, Ottawa acquired the Canadian Northern, narrowly avoiding its bankruptcy. By 1918, it was placed under an independent board of management as were two other almost bankrupt railways: the National Transcontinental Railway and Atlantic Canada's Intercolonial Railway. In 1919, and to avoid its bankruptcy, Ottawa purchased the venerable Grand Trunk Railway. While an era of railway subsidies followed, they were generally insufficient to return railways to good fiscal health.

In 1967, in response to the 1961 MacPherson Commission deregulatory recommendations, the government of Prime Minister Pierre Trudeau freed railways and their customers to negotiate freighting charges themselves (the carriage of grain was exempted from these deregulatory measures). Differential demand pricing—which railways deem essential to recovering their total costs and ensuring the network's long-term viability—means certain users are paying more than others.

Despite the deregulatory aim of the Act, its National Transportation Policy statement nonetheless demands a "competitive" railway system. This wording seeks assurance that healthy competitive alternatives exist in the marketplace to avoid any question of market abuse or price gouging. In determining whether railway pricing is competitively constrained, an examination of their commodity makeup and the other means of delivery that shippers can avail is undertaken. The key question is to ensure that competitive market pressures exist in one form or another.

From the earliest days of railway decisions from the Board of Railway Commissioners, the extensive water navigation links between Chicago, Duluth,

Thunder Bay, and numerous other Great Lakes ports to Montreal and Atlantic Canada meant that, according to one traffic manager, "for seven or eight months a year, railways could be dispensed with altogether."[51] The competitive alternate was judged to play a significant role in keeping rail rates close to those of water carriers.

These days, railways aren't the only way to get freight to Canadian ports. The two primary alternatives to rail are pipelines and trucks. These provide competitive checks on rail companies. If rail companies became suddenly uneconomical, many shipments could be transferred to trucks. Roughly 20 per cent of Canada's rail traffic already moves in containers, which can easily be transferred to truck beds. Every day, roughly 8,000 trucks cross the Ambassador Bridge at Windsor, Ontario linking Canada and the United States.

Canadian rail companies also face direct competition because a shipper can always access a different railway company, or route traffic through the United States. The short line industry, which now forms some 11 per cent of Canada's rail network, provides rail access to those businesses located on its rail lines.[52]

Competitive pressures that influence railway pricing comes through a shipper's availability to alternative ports. Container ships from Europe can move their goods through ports in either Halifax or New York. Those arriving in North America from Asia, can choose the Port of Vancouver in British Columbia or Los Angeles/Long Beach (which handles 40 per cent of goods moving through the United States). Railway rates are kept low to ensure traffic continues to roll on Canadian tracks and onward to and from Canadian ports.

When it comes to bulk shipments, like grain, a farmer's grain initially moves from farmgate to inland ports via trucks so large that they are referred

[51] *Close Ties: Railways, Government and the Board of Railway Commissioners (1851-1933)*, Chapter 2.

[52] *Pathways, supra*, note 9, Vol. 1 at 120.

to as B-trains. The driver can be directed to which of the two railways to deliver their grain, either to the CN or the CP, whichever the grain farmer and grain handler have chosen. Short-line railways, representing almost one-quarter of all of Saskatchewan's trackage, are part of the competitive grain delivery business.

Coal, another bulk shipment, originates in the remote British Columbia interior, where each mine has access to only one railway. While the commodity does not lend itself to a trucking alternative, the single railway serving that customer remains competitively constrained by coal pricing in the global marketplace. The Canadian coal producers compete with the much larger Australian and Indonesian producers. While Canadian coal shippers pay higher freight rates, they are also five or six times further away from port (and through a steep mountain climb) than their Australian or Indonesian competitors. Notwithstanding the drawback of a longer haul to port, the Canadian coal producers nonetheless remain competitive on the international market. The freight rates they are charged by Canadian railway companies are influenced by a competitive global marketplace.

Product competition acts as a competitive constraint on railway pricing as the shipper can avoid a particular rail carrier altogether. A fertilizer manufacturer, for example, can substitute soda ash, which is moved by rail, with caustic soda, which is moved by truck.

Lumber producers can ship their product by a combination of rail and trucking or by truck and on to a further reload facility (that is, within 250 miles of the plant to be considered feasible, according to the CN).

Under the various means of assessing the issue, there exists therefore a high degree of competition within the Canadian marketplace. Nonetheless, there remains some shipments, such as approximately 15 per cent of lumber production, that cannot access an alternative.

Canada's short-line railways now carry one in every five carloads that cross the country. They not only are of critical importance to remote

communities but can also serve to ease congestion on mainlines and decrease the problems associated with the higher number of trucks crossing the country's highways. The 2015 CTA Review called on Ottawa to increase infrastructure programs to their benefit. They could be key to increasing competitive options in transportation.

Competitive influences appear to be functioning well in Canada. After all, following almost two years of study, the 2015 CTA Review found "few concerns" about railway pricing.[53]

B. "EFFICIENT" RAIL SYSTEM

The National Transportation Policy statement emphasizes Canada's interest in an economically efficient railway system as a well-functioning railway system adds to the strength and viability of Canadian industries.

By the end of the 19th century, the focus of the Railway Committee of the Privy Council, a branch of the executive committee of Parliament, was on righting competing regional differences across the country. Highly competitive water navigation links in the eastern regions of North America acted to constrain railway shipping rates in Eastern Canada. The railways subsequently extended the lower eastern rates west to Winnipeg. This helped ensure the city of Winnipeg's dominance as a shipping nexus and allowed the city's industries to compete with those in Eastern Canada. For the CP, railyards in Winnipeg provided a distribution centre from which to expand their operation into the western regions of the country. Other western cities like Brandon, Calgary, Edmonton, however, were unhappy that shipments destined for Winnipeg received lower or preferential freight rates. In the same way, cities like Halifax, Saint John, Hamilton, Kingston, and Quebec City were unhappy that preferential rates were granted shipments destined for Toronto and Montreal.

The Board of Railway Commissioners, created under the 1903 *Railway Act*, were tasked with "the knotty question" of rate setting given continued

[53] *Id.* at 121.

competing regional interests. According to documents from that era, the Board would be deciding "whether Nova Scotian manufacturers should be given rates which would allow them to compete west of Montreal, or again, whether high construction and operation costs in British Columbia should enforce a rate which prevents her goods from moving far into the prairies."[54] When the Board of Railway Commissioners began equalizing rates between the cities and provinces, the action interfered with differential pricing and the railways veered into precarious financial health.

By 1904, the Board of Railway Commissioners launched a comprehensive examination of the rail rate structure across the prairies, in a case known as the Western Rates case. Western Canada had changed dramatically in the first decade of the 20th century, with a tripling of the population in western Canada through immigration from 1900 to 1910. Saskatchewan's population alone grew by 1124 per cent between 1891 and 1911. The Board of Railway Commissioners' ratemaking chose to follow the earlier pattern of attempting to set rates based on regional differences. In 1911, the earlier Winnipeg preferential rate, which had the become the Manitoba rate, was extended throughout the prairie provinces in 1911-12.

While the Manitoba Free Press wrote that the province's loss in the Western Rates case to the benefit of the other prairie provinces was about "sops instead of justice," to CP President Thomas George Shaughnessy, the rate reduction was "unnecessarily and unjustifiably drastic in character."[55]

The WWI years "created substantial operating demands on the railway network, increased the cost of labour and materials and dried up crucial sources of investment capital," writes author and McMaster University history professor, Ken Cruikshank in his book, *Close Ties: Railways, Governments and*

[54] Statcan, Transportation and Communication, at 584.

[55] *Close Ties: Railways, Government, and the Board of Railway Commissioners (1851-1933)*, Ken Cruikshank, McGill-Queen's University Press, at 125.

the Board of Railway Commissioners (1851-1933).[56] The changes to ratemaking, which resulted in lowering shipping fees provided to rail companies, coupled with the post war recession proved too crippling for Canada's railways. They became "the casualties of war," explains Cruikshank.[57] Of the three trans-continental railways, only the CP was left standing. The Grand Trunk Railway, Canada's first and largest railway, veered "from precarious to near bankrupt," before being nationalized in 1919. Its western routes were placed in bankruptcy. The equally bankrupt Canadian Northern was nationalized at that same time.[58]

While railway subsidies followed, they were generally not what was needed to right the situation. By 1961, when MacPherson was compiling his report, he was alarmed by the poor financial state of Canada's railways. He wrote that the rate increases introduced by the Board of Railway Commissioners beginning in 1915 were insufficient and had led to "disturbing effects" for railways. Not only were they "self-defeating for the railways," but they were also "inequitable for the shippers still dependent on the railways."[59]

Increasing the rail shipping rate for short hauls had provided truckers a competitive advantage as they could beat the rail shipping rate, helping them capture that traffic and leaving the railways with little flexibility to respond to the competition or otherwise adjust rates for other traffic. This encouraged the erosion of traffic for those hauls which would otherwise remain with the railways, he concluded. MacPherson noted the precipitous decline in rail shipping traffic in the years subsequent to the federally mandated rate increases.

The way railways price a shipment—known as differential demand pricing—is similar to the ways that airlines, hotels, internet service providers,

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[56] *Id.* at 127.

[57] *Id.* By June 2013, operating expenses ate up 97 per cent of Canadian North's gross railway earnings; At the Grand Trunk the figure was 89 per cent.

[58] *Id.*

[59] *Royal Commission Report on Transportation*, *supra* note 2, Vol. I, at 70.

car rental agencies and many other industries price their services. Prices are higher for some customers than for others based on the need to cover "fixed costs," that is the cost that remains unchangeable no matter how much traffic occurs. It covers rent, interest on loans, as examples. Shippers with fewer competitive options pay higher fares than those with more competitive options.

It was just the type of rate structure Canada's first railways were attempting to put in place but had been stymied by politicians and railway commissioners' focus on regional concerns. With low rates enforced by law across most of the country, there was no way the railways could recover their fixed costs. The introduction of LHI may impact railway pricing schemes as well and will lead to similar inefficiencies and losses throughout the supply chain.

LHI has already led to inefficiencies in transits. Beginning in 2018, shippers began requesting long haul transfers from Texas-based railway, Burlington Northern Santa Fe (BNSF), one of North America's largest freight railways. This resulted in such damaging congestion that the CN and the CP claimed to be required to embargo certain shipments destined to Vancouver during certain months in 2018-19. Embargoes are defined as "a method of controlling traffic movements when, in the judgment of the serving railroad, accumulations, threatened congestion or other interference with operation warrant temporary restrictions against such movements."[60]

The CN claimed that BNSF traffic increased by 20 per cent as compared to the previous year in the Thornton Railyard, a major hub for CN trains entering and leaving the Vancouver area. The 20 per cent increase came without advance warning or forecasting of those large volumes, it added.[61]

[60] CSX: Embargoes, https://www.csx.com/index.cfm/customers/news/embargoes/ (last visited Dec. 22, 2022).

[61] Letter Decision No. CONF-9-2019, ¶ 79.

To the CP, the embargos were "necessary and reasonable" and "a measured effort to control traffic for the benefit of the entire supply chain."[62] The congestion on Vancouver port's North Shore "was causing shippers to re-route traffic."[63] The CP's Director of Regulatory Finance, Tyme Wittebrood told *Trains Magazine* that the problem with interswitching is "the lack of visibility of inbound interchange traffic. Because the railway can't see the origin and destination of interchange traffic until it arrives, the railway can't plan to avoid congestion."[64]

LHI adds complexity, delays and congestion. It does not contribute to an efficient transportation system.

C. "SAFE" RAIL SYSTEM

The creation of a safe transportation system has remained the central objective of the National Transportation Policy statement found in the *Canada Transportation Act.*

A switching operation, according to the testimony of Phil Ireland, a former CP executive, before the U.S. Surface Transportation Board, which is currently examining interswitching, can involve as many as two dozen touchpoints (or points of contact). The frequency of the hand-offs of railcars and the numerous touchpoints involved make the movements riskier and more unsafe than an origin-destination movement.[65] Similarly, the lack of visibility and the congestion it causes not only damage an efficient train movement but can equally be considered a core safety issue. Traffic re-routing, last-minute

[62] *Id.* ¶ 54.

[63] *Id.*

[64] *Railroads and shippers argue over reciprocal switching proposal*, Trains Magazine, Bill Stephens, Mar. 16, 2022.

[65] Testimony of Phil Ireland: Exhibits STB Ex Parte No. 711 (filed Mar. 25, 2014).

decision-making and the possibility of error do not contribute to a safe rail system.

In recognition of the increased safety concern and heightened risk of accidents the extra moves generate, the federal government excluded toxic inhalation hazards and radioactive materials from LHI. It also disallowed LHI in Canada's busiest trade corridors and excluded certain commodities, such as vehicles, which regularly transit back and forth across the border. While the exclusions were an inherent acknowledgement of the danger involved in multiple hand-offs, railway workers will nonetheless be left to perform dangerous switching manoeuvres in countless other transits, all the while being required to meet operational efficiency in a congested network.

IX. CONCLUSION

This paper has shown that long haul interswitching—which was introduced by the federal Liberal government in May 2017 and passed into law on May 23, 2018—is interfering with the fiscal health of Canada's two Class I railways, the CN and the CP. The new policy has had the effect of regulating rates on a significant percentage of their traffic. The proportion of rail traffic diverted to long haul transfers is frequently shifting, impacting the ability of rail companies to make planning and scheduling decisions and structure their prices accordingly. When structuring shipping prices, Canada's two Class I rail companies need to make regular efficiency gains and secure enough revenue to meet their long-term investment needs.

The pricing methodology the CTA uses to calculate fees for long haul transfers is based on system wide averages. This approach does not account for the types of movements the law requires rail companies to make, nor the resources they deploy in fulfilling these transfer requests. Further, it does not consider the substantially higher taxes paid by Canadian carriers versus their U.S. counterparts, which is putting Canadian railways at a competitive disadvantage. The current pricing scheme was developed in an earlier era when trains were 40 cars long and dedicated to manifest operations. The pricing

system benefits those shippers who pursue a request, at the expense of the railways and other industries in the supply chain.

Frequent requests for long haul transfers are occurring simultaneous to a supply chain crisis, a time of record demands on Canada's rail industry, leading to scheduling problems, backlogs, and freighting delays.

Considering the above, Canada's Transport Ministry must examine a better policy alternative, a more fair and equitable system that would benefit all partners in the supply chain. The time may have in fact come for Canada to ditch the switch.

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WHAT IF THE STB GREENLIGHTS ITS SMALL RATE CASE ARBITRATION PROPOSED RULE?

By John M. Scheib[1] *and Ryan J. Starks*[2]

The United States Surface Transportation Board ("STB") has pending a Notice of Proposed Rulemaking ("NPRM") to establish a voluntary arbitration program for small rate disputes.[3] It did so in parallel with a supplemental NPRM for a final offer rate review procedure ("FORR"). In this article, we focus on the voluntary arbitration proposal.

The STB may adopt the voluntary arbitration proposal in short order, particularly in light of the railroads' willingness to participate in the program. Accordingly, this article is intended to examine this potential major shift in the way the STB handles and processes rate disputes—should rail shippers choose to use it. Railroads should pay particular attention to the various discretionary aspects of the arbitration program should they choose to opt-in. Those discretionary components (such as choosing an arbitrator, deciding how discovery will be conducted, and setting the timeline for key submissions) are explored in detail below. Shippers have more time, but will have to make decisions on a case-by-case basis. In all events, it is time to be prepared.

HISTORICAL CONTEXT

Historically, railroads have objected to arbitration proposals on the grounds that mandatory or opt-out arbitration violated the Alternative Dispute

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[3] Notice of Proposed Rulemaking, *Joint Petition for Rulemaking to Establish a Voluntary Arbitration Program for Small Rate Disputes*, Ex Parte 765, 86 Fed. Reg. 67,588 (Nov. 26, 2021) ("Proposal").

Resolution Act.[4] Nevertheless, on July 31, 2020, five Class I railroads—the U.S. operating subsidiaries of Canadian National Railway Company, CSX Transportation, Inc., the Kansas City Southern Railway Company, Norfolk Southern Railway, and Union Pacific Railroad Company—filed a petition for rulemaking to add a small rate case arbitration program, which would function alongside the STB's existing, voluntary arbitration program.[5] Although three Class I carriers opted into the existing program for some types of non-rate disputes, shippers have not utilized that arbitration program. On January 25, 2021, the sixth of the seven Class I railroads—Canadian Pacific—filed a letter stating that it supports the effort to find a "workable, reasonable, accessible arbitration program for small rate cases, and would participate in such a pilot program."[6]

Seizing on the railroads' willingness to propose and participate in an arbitration program regarding rail rates, the STB issued its NPRM on November 12, 2021, which was "modeled on some (but not all) aspects" of the railroads' proposal.[7] The Association of American Railroads ("AAR"), the industry association representing railroads, commented that "[t]he rules proposed by the Board and its staff could meet two long-sought and elusive goals: (1) making the Board's small rate case process more accessible; and (2) meeting the congressional intent of establishing a voluntary rate arbitration

[4] *See, e.g.*, Comments of Norfolk Southern Ry. Co., *Assessment of Mediation and Arbitration Procedures*, Ex Parte 699 (filed May 17, 2012) (arguing mandatory or opt-out arbitration violates Alternative Dispute Resolution Act, 5 U.S.C. §§ 570, *et seq.*).

[5] *See Joint Petition for Rulemaking to Establish a Voluntary Arbitration Program for Small Rate Disputes*, Ex Parte 765 (filed July 31, 2020). The existing rulemaking program is found at 49 C.F.R. part 1108. *Arb. of Certain Disputes Subject to the Statutory Juris. of the STB*, 2 S.T.B. 564 (1997).

[6] Comment of Canadian Pacific, *Joint Petition for Rulemaking to Establish a Voluntary Arbitration Program for Small Rate Disputes*, Ex Parte 765 at 1 (filed Jan. 25, 2021).

[7] Proposal at 8.

program."[8] AAR also noted that it believed the NPRM has the potential to result in greater railroad and shipper participation in arbitration.[9]

OVERVIEW OF THE STB's ARBITRATION PROPOSAL

I. Participation and Withdrawal

The STB proposed that Class I railroads must opt-in to the proposed program only on a term basis of five years and could not join on a case-by-case basis. A railroad would be able to file an Opt-in Notice at any time, which would be effective upon receipt by the STB or at another time specified in the notice.[10] To allow a shipper to potentially challenge rates for multi-carrier moves between a Class I and Class II or III carrier, the STB proposed that Class II or III carriers would be able to choose to voluntarily participate on a case-by-case basis. As for rail customers, they could opt in on a case-by-case basis.[11] To encourage railroads to opt in, the STB proposed that any railroad that opts in would be exempt from any final rule on FORR. The STB proposed to permit railroad that opted-in to withdraw from the program due to a material change in the law. Specifically, the STB explained that "[i]t would be reasonable for a carrier or shipper to withdraw from the proposed program, including any pending arbitration disputes, should the Board materially change the rules of that program or one of its methodologies, which could inform the arbitrators' decision."[12] Further, the STB proposed that a railroad could not be subject to more than 25 cases in a 12-month period and that any cases in excess of that

[8] Comments of the Association of American Railroads, *Joint Petition for Rulemaking to Establish a Voluntary Arbitration Program for Small Rate Disputes*, Ex Parte 765 at 1 (filed Jan. 14, 2022).

[9] *Id*. at 3.

[10] Proposal at 60-61.

[11] Proposal at 12.

[12] Proposal at 16.

amount would be postponed.[13] An individual rail customer would be limited to arbitrating just one dispute against a certain railroad at any given time.

II. Pre-Arbitration Procedures and Timelines

The arbitration process would be initiated by a shipper's submission of a written notice, known as the Initial Notice, to the participating railroad that includes information demonstrating that the dispute qualifies for the proposed small rate case arbitration program. The notice would be the evidence of the shipper opting-in to the arbitration program. The shipper must also provide a copy of the notice to the STB's Office of Public Assistance, Governmental Affairs, and Compliance ("OPAGAC").

The parties may engage in mediation prior to the arbitration phase if they mutually agree, but they would not be required to do so.[14]

The parties would file within two days following the end of mediation or following the decision not to mediate, a joint notice to arbitrate. The Joint Notice would include the basis for the STB's jurisdiction over the dispute and the basis for the parties' eligibility to participate in the proposed small rate case arbitration program.[15]

III. Arbitration Panel Selection and Commencement

The STB proposed that the parties could select arbitrators from the STB's roster of arbitrators or from others not on the roster, provided that the railroad and the shipper would have to affirmatively state their agreement to

[13] Proposal at 18.

[14] Proposal at 21-22. The default mediation period would be 30 days, measured from the date of the first mediation session, but the parties may agree to a different duration. The parties would be required to schedule their first mediation session "promptly and in good faith" after the Initial Notice is submitted to the participating railroad.

[15] Proposal at 23.

potentially use non-roster arbitrators in their Opt-in Notice and the Initial Notice, respectively.[16]

The arbitration would be handled by a panel of three arbitrators to be selected within a 14-day period.[17] Within two business days of filing the Joint Notice of Intent to Arbitrate, each side would select one arbitrator as its party-appointed arbitrator and notify the opposing side of its selection. Once appointed, the two party-appointed arbitrators would, without delay, select a lead arbitrator from a joint list of arbitrators provided by the parties. If the party-appointed arbitrators were unable to agree on a neutral, they would select from the STB's roster of arbitrators using the alternating strike method set forth in 49 C.F.R. § 1108.6(c).

Parties would be able to object to the opposing side's selected arbitrator, including for an alleged lack of independence, consistent with 49 U.S.C. § 11708. If the objection is not resolved during a meet and confer that occurs within two business days after the objection, the objecting party must immediately notify OPAGAC. An Administrative Law Judge would then hear the objection and issue a short written order.

Each party would pay the costs of its own party-appointed arbitrator. Parties to arbitration "will share the cost of the lead arbitrator equally," which the STB noted would "give the parties in an arbitration with three or more parties flexibility to negotiate each party's share of the lead arbitrator's cost on either a per-side or per-party basis."[18]

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[16] Proposal at 24.

[17] As part of the Initial Notice, which is served on the participating carrier and OPAGAC, the shipper would include a statement that it likewise agrees to extend the arbitrator selection deadline. Similarly, as part of its Opt-in Notice, a railroad would provide the STB with a statement that it agrees to extend the 14-day deadline in any arbitration brought under the program. Proposal at 26.

[18] Proposal at 26.

Within two business days after the arbitration panel is selected, the lead arbitrator shall commence the arbitration process in writing.[19]

The STB further proposed that the parties, with the help of the arbitration panel, would have to create a written arbitration agreement. At a minimum, that agreement would state with specificity the issues to be arbitrated and the corresponding monetary award cap to which the parties have agreed. The arbitration agreement would also incorporate by reference the rules set forth in 49 C.F.R. § 1108.27.[20]

IV. Record Building Process and Decision Timing

Under the proposed rule, that record building process would begin with a 90-day evidentiary phase comprised of 45 days for discovery and an additional 45 days for the submission of pleadings or evidence. The arbitration panel would be able to extend the "discovery sub-phase" upon request, but an extension of either discovery "sub-phase" would not automatically extend the entire evidentiary phase beyond 90 days (if one sub phase is extended the other is shortened by the same amount). However, parties could agree to extend the entire evidentiary phase or an individual party may request an extension from the arbitration panel. The record-building timeline would run from commencement of the arbitration (*i.e.,* two business days after the arbitration panel is appointed). Railroads and shippers must provide their consent to extend these deadlines in their Opt-in Notice and Initial Notice, respectively.[21]

Discovery would be limited to 20 written document requests, five interrogatories, and no depositions.[22]

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[19] Proposal at 26.

[20] Proposal at 26-27.

[21] Proposal at 27-28.

[22] Proposal at 28.

Each party to the arbitration would be automatically entitled to confidential Waybill data for the preceding four years, but that sample would be limited to the defendant railroad(s) and the commodity at issue at the five-digit Standard Transportation Commodity Code ("STCC") level. If a party desired access to the Waybill Sample for data from additional years, other commodity traffic of the defendant carrier, or other carriers, the party would have to file a request pursuant to 49 C.F.R. § 1244.9(b)(4). The Joint Notice would be submitted to the Director, along with a letter containing the five-digit STCC information necessary for the STB's Office of Economics ("OE") to produce the confidential Waybill Sample data subject to automatic disclosure, and then OE would provide this data within seven days.[23]

The proposed rule briefly discusses admissible evidence. In particular, the STB notes that other arbitration decisions would be inadmissible, while certain evidence of a railroad's revenue adequacy would be admissible.[24]

The arbitration panel would issue its decision no later than 30 days after close of the evidentiary phase.[25]

V. Market Dominance

Market dominance is a jurisdictional prerequisite to a rate case.[26] Therefore, under the STB's proposed rule, arbitrators would be empowered to resolve market dominance, if the railroad does not concede it. Or, the parties could also agree to ask the STB to resolve market dominance prior to initiating arbitration.[27] The shipper may choose between having the arbitration panel use either the streamlined market dominance test or the non-streamlined market

[23] Proposal at 29-31.

[24] Proposal at 32.

[25] Proposal at 40.

[26] 49 U.S.C. § 11708(c)(1)(c) requires that market dominance be determined under 49 U.S.C. § 10707.

[27] Proposal at 35.

dominance test.[28] However, the panel would not be able to use the STB's Limit Price Test. Product and Geographic evidence would be inadmissible for purposes of determining market dominance, just as it is in a rate case filed with the STB.[29]

VI. Maximum Lawful Rate and Relief Limit

Under the statutory provisions of 49 U.S.C. § 11708(c)(3) and (d)(1), when deciding whether a rate is reasonable, an arbitration panel must: (i) consider the Board's methodologies for setting maximum lawful rates, giving due consideration to the need for differential pricing to permit a rail carrier to collect adequate revenues; and (ii) ensure that its decision is consistent with sound principles of rail regulation economics.[30] Thus, the STB's rule proposes that the arbitration panel would consider the STB's methodologies for setting maximum lawful rates, giving due consideration to the need for differential pricing to permit a rail carrier to collect adequate revenues (as determined under 49 U.S.C. § 10704(a)(2)). The arbitration panel would otherwise be able to base its decision on the STB's existing rate review methodologies, revised versions of those methodologies, new methodologies, or market-based factors, including: rate levels on comparative traffic; market factors for similar movements of the same commodity; and overall costs of providing the rail service.[31] The arbitration panel's decision would have to be consistent with sound principles of rail regulation economics. The STB expects the arbitration panel to be informed by the rail transportation policy at 49 U.S.C. § 10101, to consider the Long-Cannon factors at 49 U.S.C. § 10701(d)(2), and to use appropriate economic principles.[32] Further, the arbitration panel is not

[28] Proposal at 36.

[29] Proposal at 36.

[30] Proposal at 37.

[31] Proposal at 37.

[32] Proposal at 37-38.

prohibited from considering the evidence of the railroad's revenue adequacy or revenue adequacy methodologies.[33]

Under the STB's proposed rule, relief would be limited to $4 million over two years, inclusive of prospective rate relief, reparations for past overcharges, or any combination thereof, unless otherwise agreed to by the parties.[34] Reparations or prescriptions may not be set below 180% of variable cost, as determined by unadjusted Uniform Railroad Costing System (URCS).[35]

VII. Appeals

The STB's proposal would require a petition to vacate or modify the arbitration decision to be filed within 20 days from the date on which the arbitration decision was served on the parties. The party appealing would be required to include both a redacted and unredacted copy of the arbitration decision. Replies to the petition would be filed under seal within 20 days of the filing of the petition to vacate or modify with the STB. The STB's standard of review of arbitration decisions would be limited to determining only whether: (1) the decision is consistent with sound principles of rail regulation economics; (2) a clear abuse of arbitral authority or discretion occurred; (3) the decision directly contravenes statutory authority; or (4) the award limitation was violated. Parties would also be able to seek judicial review of arbitration awards in a court of appropriate jurisdiction pursuant to the Federal Arbitration Act, 9 U.S.C. §§ 9-13, in lieu of seeking Board review.[36]

VIII. Confidentiality and Precedential Value

Under the STB's proposal, the arbitration process would be confidential, including discovery, filings to the arbitrators, the Initial Notice

[33] Proposal at 40.

[34] Proposal at 41-43.

[35] Proposal at 67.

[36] Proposal at 44.

and OPAGAC confirmation letter, the Joint Notice, and confidentiality agreements concerning Waybill Sample data, and materials filed in an appeal to the STB.[37] Further, arbitration decisions would have no precedential effect.[38]

BE PREPARED

The STB has a lot on its plate. This NPRM has been pending for nearly one year. Given the fact that this is really the first time that Class I railroads have supported a rate arbitration program, it could be just a matter of time before the STB finalizes the program and before Class I railroads must decide whether to opt-in. Given the short timelines in the arbitration proposal, a Class I railroad that contemplates opting-in should at least be thinking hard now about issues that it must address in its Opt-in Notice, including its willingness to use non-roster arbitrators, to extend the 14-day deadline for selection of arbitrators, to consent to extend discovery deadlines, and to accept a rate cap higher than in the rule.

[37] Proposal at 44-51.

[38] Proposal 51.

WILL MERGER IMPROVE THE FINANCIAL PERFORMANCE OF CP AND KCS?

By Kevin Neels, Nicholas Powers, and Ivy Yang[*]

I. Introduction

As we write this article in the Fall of 2022, the Surface Transportation Board ("STB" or "Board") is reviewing the planned acquisition of the Kansas City Southern Railway ("KCS") by the Canadian Pacific Railway ("CP") to create the Canadian Pacific Kansas City ("CPKC").[1] If approved, this merger would represent the first merger of Class I railroads in two decades and by many measures the largest freight rail transaction in the United States over the same time period.[2]

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The opinions expressed are those of the authors and do not necessarily reflect the views of the firm or its clients. This article is for general information purposes and is not intended to be and should not be taken as legal advice.

[1] STB Docket No. FD 36500.

[2] CP has said it hopes to receive STB approval by early 2023. Joanna Marsh, "7 takeaways from STB's hearing on proposed CP-KCS merger," *FreightWaves*, Oct. 5, 2022, https://www.freightwaves.com/news/7-takeaways-from-stbs-hearing-on-proposed-cp-kcs-merger. For the purpose of the article, we assume that approval will be granted without requiring any significant divestitures. We do not take a position on whether the STB should or should not approve the merger.

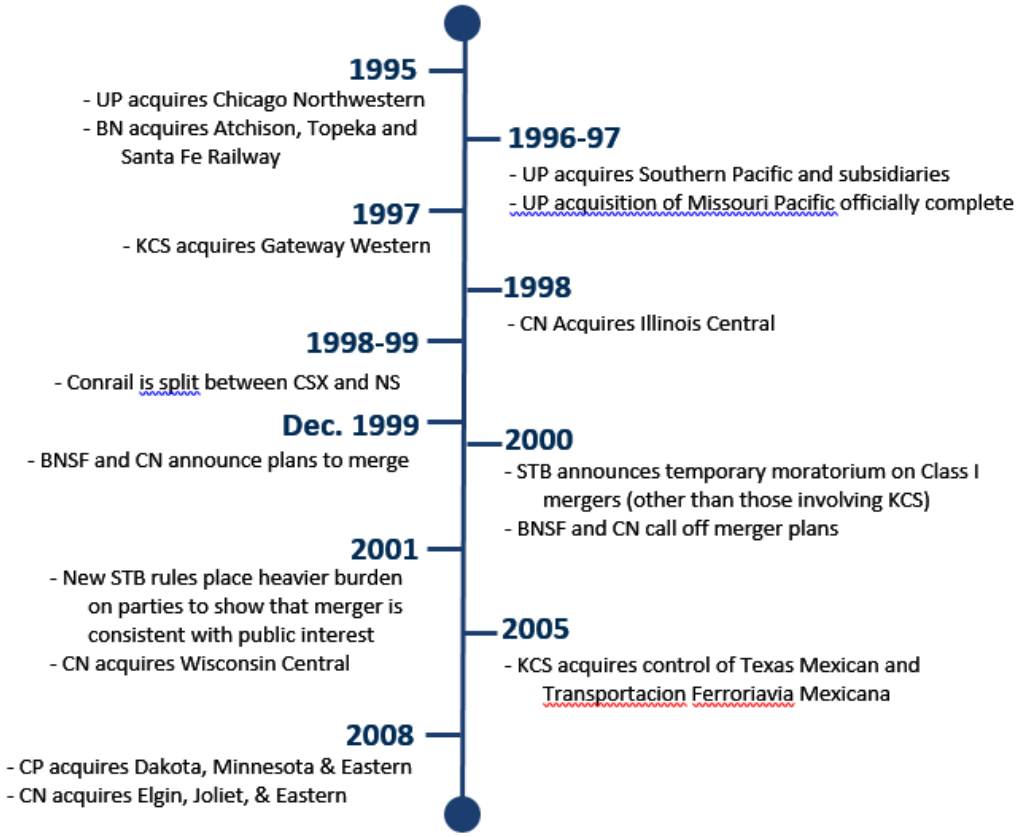
In this paper we examine the likely economic impacts of the planned merger. We begin by examining this planned merger in the context of the multi-decade process of consolidation that has reduced the number of Class I railroads from 38 at the time of the industry's deregulation to the present seven. These earlier mergers took place within an environment and market context that was markedly different from that which exists today. For that reason, those earlier experiences provide little guidance regarding what to expect from the upcoming CP/KCS merger. Statistical analysis of data drawn from more recent industry experience suggests that the increase in scale that will result from this merger is likely to enable post-merger railroad to achieve efficiency gains and improved returns on investment relative to its pre-merger components. However, because the current number of Class I railroads is small, and because these railroads differ so markedly in culture, traffic mix, network structure and other non-scale related ways, it is difficult to confidently make predictions. The ultimate outcome of the imminent CP/KCS merger will depend to a considerable extent on the nature of the culture, management philosophy and operational plan that emerges once the integration process is complete.

II. Rail Mergers and STB Regulation, 1980 to Present

The years following the passage of the 1980 Staggers Act, which largely deregulated the U.S. railroad industry, were marked by significant consolidation. In 1980 there were 38 Class I railroads in the United States. Over the next ten years, mergers, acquisitions and other changes of status had reduced this number to 14. By 1995 the number of U.S. Class I railroads had fallen to eleven. By 2000, the number had fallen to eight, and by 2002 the number had fallen to seven—the same number we see today.[3] Mergers accounted for the vast majority of the reduction in the number of Class I railroads that occurred over this period. Figure 1 lists some of the major milestones in this process.

[3] Bureau of Transportation Statistics, https://www.bts.gov/content/rail-profile (last visited Dec. 20, 2022).

FIGURE 1: NOTABLE RAIL MERGERS AND RELATED EVENTS, 1995 – 2008



Note: Stated dates may refer to different stages of a sometimes protracted merger process.

Over this same period the economic performance of the railroad industry improved dramatically. Traffic volumes grew substantially. Rates charged to shippers declined in real terms, and yet, because of steady increases in productivity, the bottom-line performance of the railroad industry improved. The industry made sometimes halting, but generally steady, progress toward

the long-sought regulatory goal of revenue adequacy.[4] Most industry observers believe that the merger wave that swept through the industry in the closing decades of the twentieth century contributed in a major way to this improvement in economic performance. Gallamore and Meyer, in their seminal work on the U.S. railroad industry, conclude:

> What has happened in the U.S. railroad industry as a result of the fin-de-siècle mergers? The industry has continued its renaissance—primarily a function of Staggers Act lessening of regulation, but certainly with important contributions from the final wave of twentieth-century rail mergers.[5]

This wave of mergers came to an abrupt end in the year 2000. On December 20, 1999, Burlington Northern Santa Fe ("BNSF") and Canadian National ("CN") announced their plan to merge.[6] In response, the industry's regulator, the STB became concerned about growing concentration in the U.S. rail industry, and about the possibility that a merger of BNSF and CN could trigger a final wave of consolidation that could substantially reduce the already small number of Class I railroads. In response, the Board declared a temporary moratorium on rail mergers, and initiated a rulemaking aimed at the establishment of a new and more restrictive set of rail merger guidelines.[7]

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[4] The STB regards a railroad as "revenue adequate" if its rate of return on investment ("ROI") equals or exceeds its cost of capital as computed by the Board. *See, e.g.*, STB, "Railroad Revenue Adequacy—2019 Determination," Decision 50375, Docket No. Ex Parte 552 (Sub-No. 24) (Oct. 1, 2020).

[5] Robert E. Gallamore and John R. Meyer, "American Railroads: Decline and Renaissance in the Twentieth Century," *Harvard University Press*, 2014, page 305.

[6] Daniel Machalaba and Steven LipinStaff, "Burlington Northern to Merge With Canadian National Rail," *The Wall St. J.*, Dec. 20, 1999, https://www.wsj.com/articles/SB945649778591009772.

[7] STB Ex Parte No. 582 (Sub-No. 1).

The new rail merger guidelines that emerged from this rulemaking took effect on July 11, 2001.[8] They established more extensive reporting requirements for merger applicants, and required more aggressive remedial action to address any possible reductions in competition that would be caused by a proposed merger. In these and other ways, the new rules substantially raised the hurdles that merger applicants would be required to clear before winning approval for their proposed transaction. In response to these actions by the Board, BNSF and CN called off their proposed merger.

With these developments, the great U.S. railroad merger wave largely came to an end. Although a few somewhat significant mergers did take place following issuance of the STB's new merger guidelines, these transactions were typically of a much smaller scale than those that occurred during the great merger wave. The most recent of these, occurring in 2008, was the acquisition by Canadian National of the Dakota, Minnesota and Eastern, a Class II railroad.[9]

III. Overview of the CP/KCS Merger and Timeline

The great pause in the consolidation of the U.S. railroad industry ended on March 21, 2021, when the CP and KCS railroads announced their plans to merge.[10] This proposed combination represented a perfect end-to-end merger. As illustrated in Figure 2, the two networks touch at only a single point—Kansas City. As such, the proposed combination raised relatively few competitive concerns, according to the STB, which had stated when it issued its new merger guidelines in 2001 that a "potential transaction involving [KCS]

[8] Major Rail Consolidation Procedures, STB Ex Parte No. 582, 66 Fed. Reg. 32582 (2001), https://www.govinfo.gov/content/pkg/FR-2001-06-15/pdf/01-14984.pdf.

[9] Allan Dowd, "CP Rail agrees to buy DM&E for at least $1.5 billion," *Reuters*, Sept. 5, 2007. https://www.reuters.com/article/us-canadianpacific-dme/cp-rail-agrees-to-buy-dme-for-at-least-1-5-billion-idUSN0543024620070906.

[10] Press Release, Kan. City S., "Canadian Pacific and Kansas City Southern Agree to Combine to Create the First U.S.-Mexico-Canada Rail Network" (Mar. 21, 2021), https://investors.kcsouthern.com/news-releases/2021/03-21-2021-110015703?sc_lang=en.

and another Class I carrier would not necessarily raise the same concerns and risks as other potential mergers between Class I railroads."[11] It cited this same language when it ruled that the proposed merger would be evaluated under the old rail merger guidelines.[12] Some parties have raised concerns that the merger could lead to anti-competitive effects by eliminating commercial neutrality at interchanges CP and KCS currently maintain with other railroads.[13] We are not addressing these issues here, but are focusing instead on potential efficiency improvements and the resulting changes in railroad returns.

The transaction would link CP's extensive Canadian network with KCS's extensive Mexican network, causing some observers to refer to the proposed combination as the "NAFTA" railroad.[14] It would join the two smallest (by U.S. route mileage) of the remaining U.S. Class I railroads.

[11] STB, Decision, STB Ex Parte No. 582 (Sub-No. 1), "Major Rail Consolidation Procedures," at 15 (June 11, 2001).

[12] STB, Decision, Docket No. FD 36500, at 2 (Apr. 23, 2021).

[13] *See*, *e.g.*, "Final Brief of the Chlorine Institute," STB, Docket No. FD 36500, Oct. 21, 2022, at 4-7. The concern relates to potential vertical competitive harm, related to the single interchange point between the current CP and KCS networks. CP maintains connections with other Class I railroads that serve the same territories as KCS; similarly, KCS maintains connections with other Class I railroads that serve regions where they compete with CP. Currently, each of the merging roads is indifferent as to which Class I railroad it connects with when providing through-route services. The concern raised by some parties is that a combined CPKC would have strong incentives to favor its own long-haul route, with vertical foreclosure on certain routes being a potential result.

[14] Chris Woodward, "Canada-US Rail Mega-Merger Raises Fears of 'NAFTA Super Railway'," *Inside Sources*, Mar. 24, 2022, https://insidesources.com/canada-us-rail-mega-merger-raises-fears-of-nafta-super-railway/.

FIGURE 2: KCS AND CP RAIL NETWORKS

Source: Brattle Rail Network Model

Not surprisingly, the proposed transaction encountered a few bumps along the road to its final execution. CN, alarmed, perhaps at the prospect of finding itself the smallest of the remaining U.S. Class I railroads, announced on April 21, 2021, a competing offer to acquire KCS, one that KCS found to be superior to the Canadian Pacific offer.[15] CP declined to sweeten its original

[15] Press Release, Canadian National, "CN Makes Superior Proposal to Combine With Kansas City Southern" (Apr. 20, 2021), https://www.cn.ca/en/news/2021/04/cn-makes-superior-proposal-to-combine-with-kansas-city-southern/.

offer, and KCS elected to move forward with a merger with CN,[16] despite the fact that the STB had agreed to evaluate the proposed CP/KCS merger under the terms of its pre-2000 merger guidelines,[17] and that the U.S. Department of Justice that concluded that "CN's proposed acquisition of KCS appears to pose greater risks to competition than the risks posed by a CP-KCS merger."[18] Plans for the CN/KCS merger moved forward until September 12, 2021, when the STB rejected CN's proposal to use a voting trust to facilitate its merger with KCS.[19] Faced then with the prospect of a long, arduous and uncertain uphill battle to overcome regulatory barriers, the two parties abandoned their plans to merge. KCS accepted CP's original offer on September 12, 2021,[20] and plans for their merger began to move forward in earnest.

IV. How Will the Benefits of the CP/KCS Merger Compare to Those of Previous Rail Mergers?

As the merger of CP and KCS moves toward its final closure, it is reasonable to ask how the benefits of this consolidation will compare to the benefits of the rail mergers that occurred in the closing decades of the twentieth century. However, the answer to this question is not obvious.

Some of the types of benefits achieved in the earlier wave of railroad mergers can also be expected to be achieved by the CP/KCS merger. Earlier

[16] Press Release, Kan. City S., "CN to Combine With Kansas City Southern," (May 21, 2021), https://investors.kcsouthern.com/news-releases/2021/05-21-2021-161530923?sc_lang=en.

[17] Marybeth Luczak, "STB OKs KCS Waiver for CPKC," *Railway Age*, Apr. 24, 2021, https://www.railwayage.com/news/stb-oks-kcs-waiver-for-cpkc/.

[18] STB Finance Docket No. 36514, "Comment of the United States Department of Justice," May 14, 2021, https://www.justice.gov/atr/page/file/1395581/download.

[19] William C. Vantuono, "STB Unanimously Rejects CN-KCS Voting Trust. CPKC Back In Play," *Railway Age*, Aug. 31, 2021 (updated Sept. 3, 2021), https://www.railwayage.com/news/stb-unanimously-rejects-cn-kcs-voting-trust/.

[20] CNBC, "Kansas City Southern picks Canadian Pacific's $31 billion bid for railroad," Sept. 12, 2021, https://www.cnbc.com/2021/09/12/kansas-city-southern-picks-canadian-pacific-31-billion-bid-for-railroad.html.

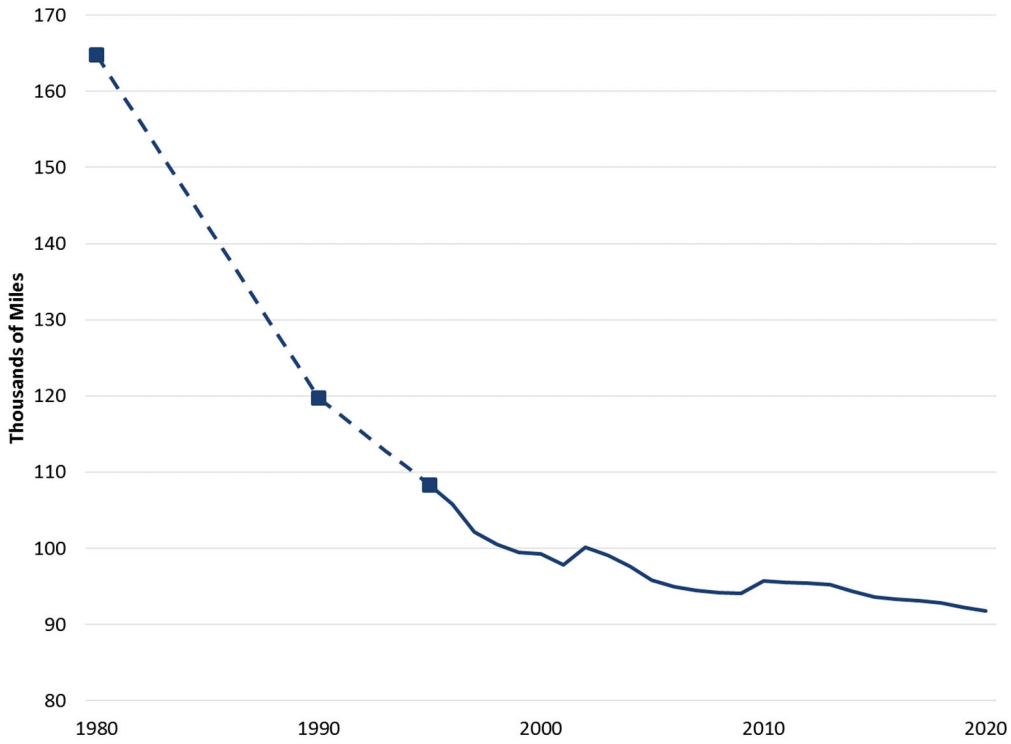
mergers made it possible to spread fixed and partially fixed administrative, management and overhead costs over larger volumes of traffic, reducing unit costs. End-to-end mergers eliminated the delays, costs and inefficiencies associated with traffic formerly interchanged between merging railroads. They also facilitated longer and more efficient lengths of haul. More generally, as we discuss in more detail below, there appears to be an economically meaningful association between a railroad's scale of operation, as measured by its route mileage, and its ability to achieve revenue adequacy.

However, some of the benefits that were generated by past railroad mergers are unlikely to flow from the proposed CP/KCS combination. Parallel mergers have facilitated the retirement of redundant trackage, leading to higher and more efficient traffic densities. They have sometimes permitted more efficient operational strategies, such as the establishment of one-way traffic on each of a parallel pair of track segments. Of course, parallel mergers have also raised concerns about potential reductions in competition. However, none of these potential positive or negative effects is relevant to the purely end-to-end CP/KCS merger.

Perhaps one of the most important factors to consider in assessing the possible benefits of the CP/KCS merger is that it is taking place in an industry that differs dramatically from that in which the late twentieth century wave of consolidation occurred. Figure 3 through Figure 6 illustrate important aspects of the evolution of the freight rail industry over the last 40 years.

As the Class I railroad industry consolidated, the merged entities often retired redundant lines. Outside of the restructuring triggered by mergers, most Class I railroads took advantage of the more liberal abandonment regulations established by the STB to close down unneeded sidings and branch lines. Large numbers of low-density branch lines were also spun off as short lines. The net result, as shown in Figure 3, was that the miles of road collectively operated by the Class I railroads shrank substantially (by 44%) over this 40-year period. The vast majority of this decline in total route mileage occurred prior to the year 2000.

FIGURE 3: MILES OF ROAD OWNED BY CLASS I RAILROADS, 1980 – 2020



Sources and Notes: Bureau of Transportation Statistics Rail Profile, The Brattle Group. Data for 1981-1989 and 1991-1994 is interpolated using data points for 1980, 1990, and 1995.

However, by the early years of the twenty-first century, the problem of excess rail capacity and route mileage had been greatly reduced, if not eliminated. Industry attention began to shift toward problems of congestion and capacity constraints. An opinion piece published in 2005 noted that the industry was experiencing "rail capacity stretched to never-before-seen limits."[21] Major investments were made to double-track what had formerly been long stretches of single-track line, and to eliminate bottlenecks responsible

[21] John Gallagher, "Derailing the Economy," *Journal of Commerce*, March 13, 2005.

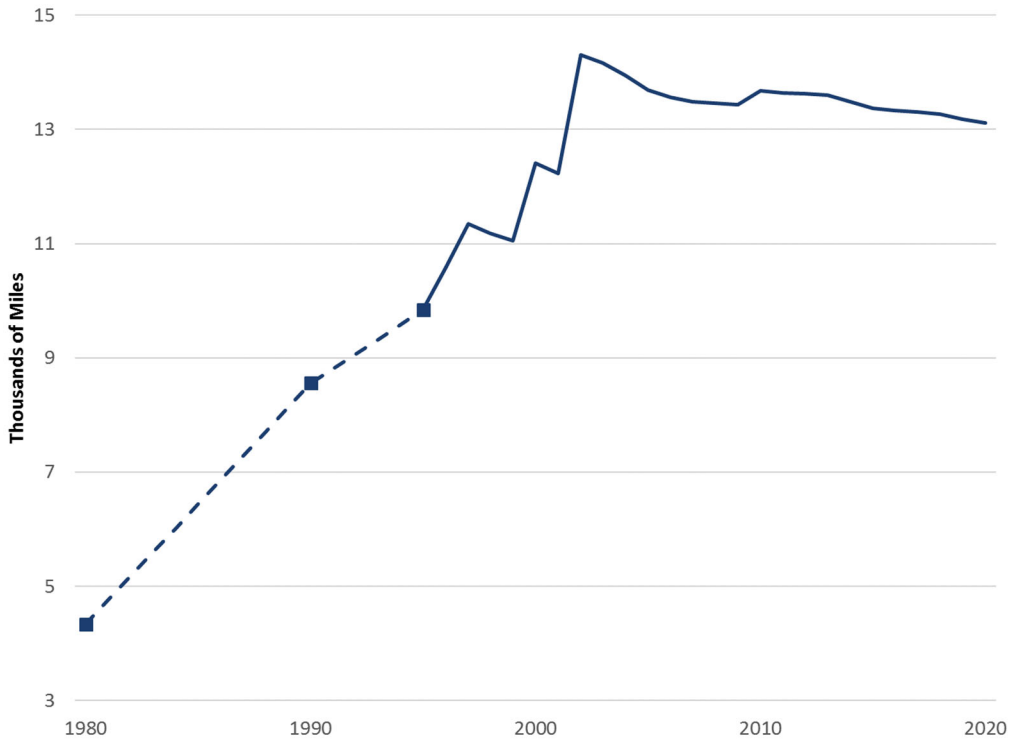
for lengthy delays.[22] In recent decades some former rail rights-of-way that had been converted to bicycle trails have been converted back to rail use.[23] Railroad sales and marketing efforts shifted from attempts to fill under-utilized networks with any traffic that offered a positive incremental contribution, to "de-marketing" efforts aim at the elimination of low-yield rail traffic.

At the same time, as shown in Figure 4, the average size of a Class I railroad roughly tripled. All of this increase took place during the great merger wave. Since 2002, the size of the average Class I railroad has declined.

[22] *See*, for example, BNSF 2014 plan to double track its main line through New Mexico. *See* Progressive Railroading, "BNSF begins double-track project in New Mexico," July 31, 2014, https://www.progressiverailroading.com/mow/news.aspx?id=41210, or Union Pacific Railroad's ("UP") double tracking of its Sunset Route. *See* Progressive Railroading, "UP resumes double-track project on Sunset Route," Oct. 7, 2010, https://www.progressiverailroading.com/rail_industry_trends/news.aspx?id=24677.

[23] For example, in 2012 the R.J Corman Railroad Company received STB approval to construct a new rail line on rail-banked right of way that had been in use as a bicycle trail. *See* STB, "Budget Request for FY 2014," Apr. 2013, at 12, https://www.stb.gov/wp-content/uploads/FY-2014-Budget-Request.pdf.

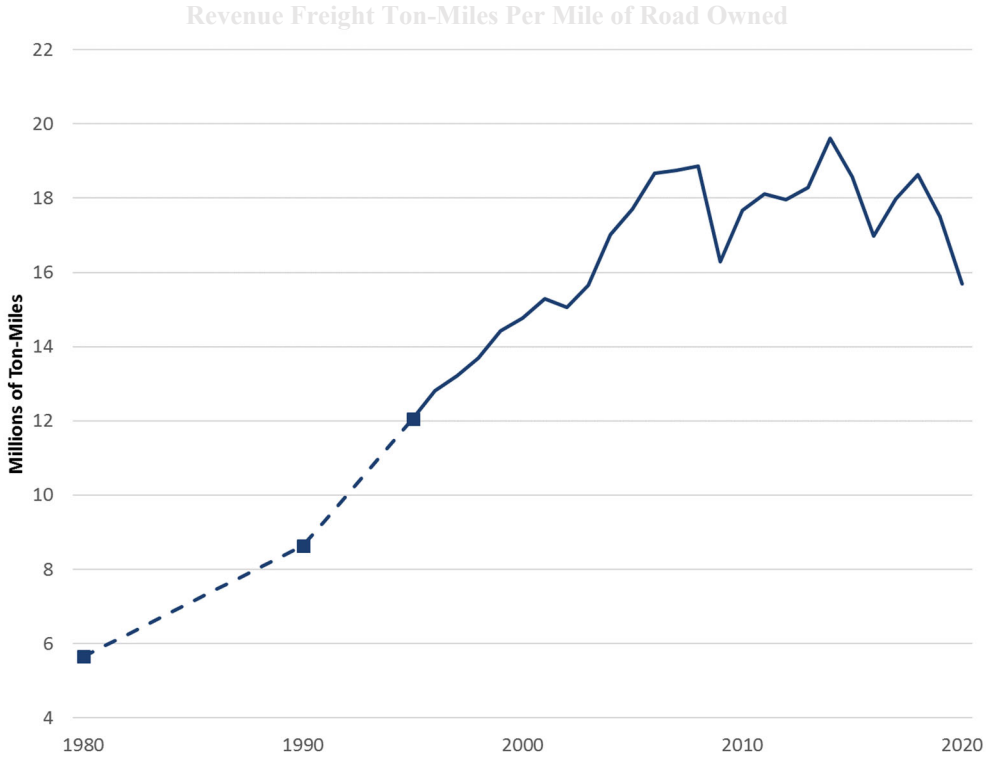
FIGURE 4: AVERAGE CLASS I RAILROAD SIZE, IN TERMS OF MILES OF ROAD OWNED, 1980 – 2020



Sources and Notes: Bureau of Transportation Statistics Rail Profile, The Brattle Group. Data for 1981-1989 and 1991-1994 is interpolated using data points for 1980, 1990, and 1995.

As traffic levels increased, despite network consolidation, traffic density, as measured by the ratio of revenue ton-miles to miles of road in Figure 5, also roughly tripled. Growth in average traffic density was fairly steady until the financial crisis of 2008-2009. Since then, average traffic density has fluctuated with market conditions, with no clear overall trend up or down.

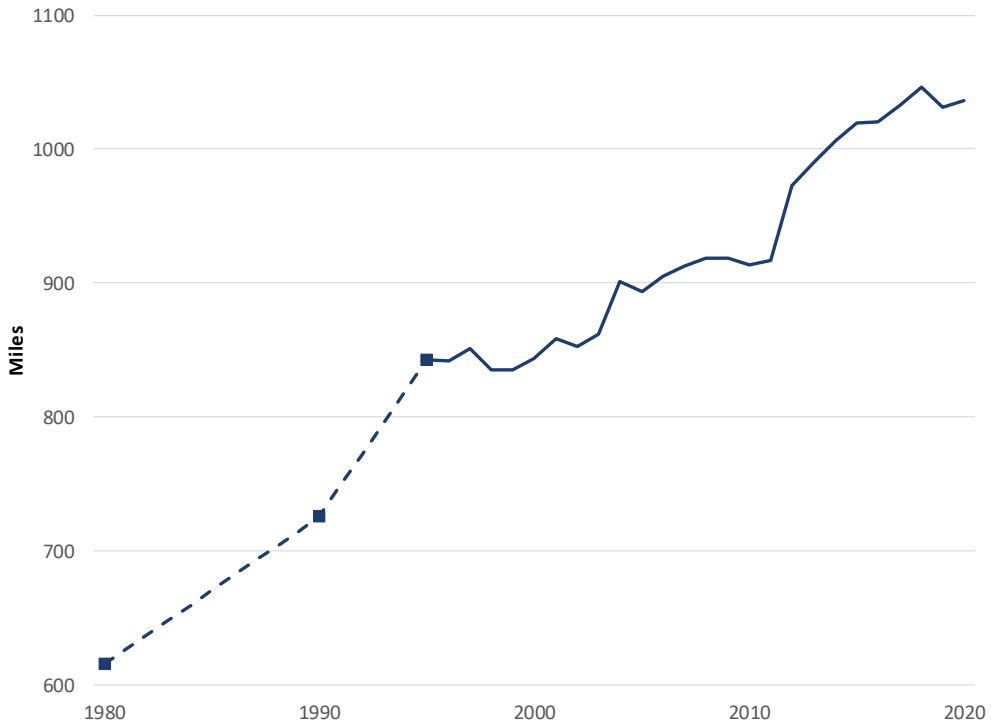
FIGURE 5: CLASS I TRAFFIC DENSITY, 1980 – 2020



Sources and Notes: Bureau of Transportation Statistics Rail Profile, The Brattle Group. Data for 1981-1989 and 1991-1994 is interpolated using data points for 1980, 1990, and 1995.

The industry also achieved efficiency gains through longer average hauls, as indicated in Figure 6. Unlike other measures, average length of haul continued to grow throughout the period, up to the start of the Coronavirus pandemic.

FIGURE 6: AVERAGE LENGTH OF HAUL BY CLASS I RAILROADS, 1980 – 2020



Sources and Notes: Bureau of Transportation Statistics Rail Profile, The Brattle Group. Data for 1981-1989 and 1991-1994 is interpolated using data points for 1980, 1990, and 1995.

It is striking how many of these important trends changed shortly after the turn of the century. Clearly, the U.S. railroad industry of the early twenty-first century is a very different animal from the railroad industry of the late twentieth century. Hence, it is unclear how many of the lessons of the late twentieth century wave of rail mergers will apply to the imminent merger of CP and KCS.

V. Will Increased Scale Make the Merged Entity More Profitable?

One significant effect of the merger that can be anticipated is the creation of a much larger railroad. Table 1 shows the route mileages of the seven Class I railroads as of the end of 2021. Focusing first on U.S. route mileage, the seven Class I railroads can be classified into three groups: the two large western railroads (BNSF and UP), the two large eastern roads (CSX Transportation ("CSX") and Norfolk Southern ("NS")), and the remaining three roads, which are significantly smaller than those in either of the first two groups. CP and KCS are the smallest in terms of route mileage. This classification is somewhat misleading, however, since KCS, CP, and CN all operate significant route mileage outside of the United States. Focusing on system-wide route mileage yields a slightly different picture. BNSF and UP remain by far the largest, with networks of roughly comparable size. CN joins CSX and NS in a second group with networks of smaller and roughly comparable sizes. Even by this more inclusive measure, however, CP and KCS remain the smallest of the seven Class I railroads.

The last line of the table shows the size of a merged CP/KCS network. By U.S. mileage, CN assumes the position of the smallest carrier in a post-merger world. The merged CP/KCS entity rises to the second smallest slot. By system mileage, however, the merged entity becomes the third largest, eclipsing in size by a slight margin the networks of CN, CSX, and NS.

TABLE 1: ROUTE MILEAGE BY RAILROAD AS OF THE END OF 2021

	2021 Route Mileage	
	U.S.	Systemwide
BNSF Railway	32,806	32,806
Canadian National Railway (CN)	5,834	19,500
Canadian Pacific Railway (CP)	5,181	13,046
CSX Transportation	19,433	19,433
Kansas City Southern Railway (KCS)	3,262	7,100
Norfolk Southern Railway (NS)	19,331	19,331
Union Pacific Railroad (UP)	32,452	32,452
Canadian Pacific Kansas City (CPKC)	8,443	20,146

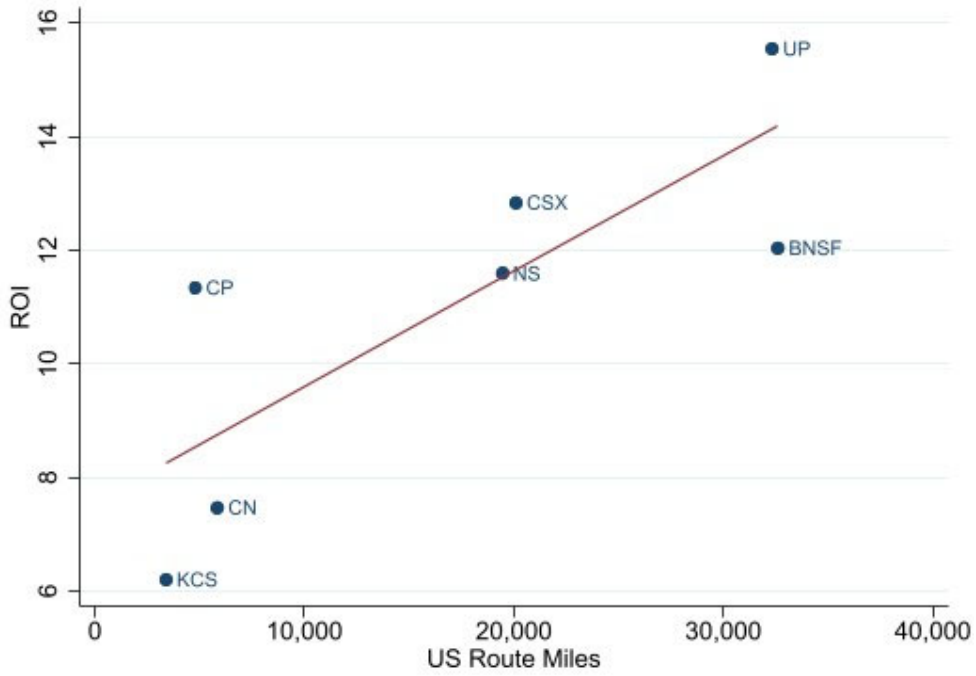
Source: 2021 R-1 Forms as provided on the STB website.
Note: Route mileage total for CPKC assumes no post-merger retirement or abandonment of lines.

There is evidence that size matters for economic performance, even for the twenty-first century U.S. railroad industry. By a number of measures, larger railroads have performed better over the past two decades than smaller railroads.

Figure 7 plots annual railroad ROI by railroad in 2019, as calculated by the STB,[24] against U.S. route mileage in that same year. The upward trend in this chart is clear. Although other factors are clearly at work, there is a tendency for larger railroads to earn higher returns than smaller railroads.

[24] The STB's calculations of railroad ROI are based upon data reported by railroads in their annual R-1 reports. These reports present information on the revenues, costs, investments and assets of the reporting companies' U.S. railroad operations. As such, they do not reflect returns earned by non-railroad subsidiaries, or on non-U.S. railroad operations.

FIGURE 7: RETURN ON INVESTMENT FOR 2019 AND U.S. ROUTE MILEAGE



Notes and Sources: ROI data are sourced from the STB's 2019 Revenue Adequacy Report. STB, "Railroad Revenue Adequacy – 2019 Report." Decision 50374, Docket No. Ex Parte 552 (Sub-No. 24). Data on U.S. route miles are from 2019 R-1 reports as provided on the STB website. The patterns displayed by this 2019 graph are broadly representative of the relative magnitude of each railroad's ROI and U.S. route miles for the last several years.

Figure 7, of course, shows only the relationship between network size and ROI for a single year. It is reasonable to ask whether this relationship persists over time. To answer this question, we run a simple regression analysis on a dataset containing annual ROI by railroad and by year for the period 2006 through 2021, the most recent year for which data are available. We selected 2006 as the start of our analysis period because it falls after the time concerns over rail congestion and capacity constraints emerged as widespread concerns.

In order to analyze the relationship between network size and ROI over time, it is necessary to account for the effects of shifts in overall market conditions. In a general economic downturn—such as that which occurred during the 2008-2009 period—the economic performance of all railroads will be adversely affected. Conversely, a period of strong economic growth will boost the performance of all railroads. The analysis takes these effects into account in two ways. First, the regression takes as a dependent variable the difference between the ROI earned by a specific railroad in a specific year, and the railroad industry cost of capital in that same year, as calculated by the STB.[25] Second, we include in the regression model a complete set of year fixed effects.

The analysis considers the effects on economic performance of two alternative measures of scale. As in Table 1, we consider two alternative specifications. In the first, the key explanatory variable is based on a railroad's total route miles within the United States. In the alternative specification, the key explanatory variable is based on system-wide route miles, including mileage outside the United States. Because of the substantial differences in network size found in the data, both variables are entered in logarithmic form.

Table 2 presents the regression results based upon U.S. route mileage. The first column presents results based upon an ordinary least squares estimator. The second shows results based upon a panel data estimator accounting for possible unobserved heterogeneity across railroads by including random effects by railroad. Both specifications include a full set of year fixed effects. In both cases, the coefficients of route mileage are positive, and statistically significant. These results document a consistent pattern over the

[25] The STB updates its estimate of the railroad industry cost of capital annually. This calculation is based on the returns generated by the company's U.S. railroad operations. Thus, it does not include or reflect returns generated by non-railroad subsidiaries, or by non-U.S. railroad operations. If a railroad's ROI exceeds the industry cost of capital in a given year, the STB judges that railroad to be "revenue adequate."

2006-2021 period: larger railroads tend to generate higher returns on investment.

TABLE 2: REGRESSION ANALYSIS OF THE RELATIVE RETURN ON INVESTMENT ON U.S. ROUTE MILES, 2006 – 2021

	(1)	(2)
VARIABLES	OLS Pooled	Railroad Random Effects
Natural Log of US Miles of Road	1.523***	1.392***
	(0.406)	(0.486)
Constant	-13.86**	-13.510***
	(4.430)	(3.777)
Observations	112	112
R-squared	0.455	
Year fixed effects	Y	Y
Year Range	2006-2021	2006-2021
Number of rr_id		7

Standard errors (in parentheses) are clustered at the railroad level.

*** p<0.01, ** p<0.05, * p<0.1.

Sources: STB Railroad Revenue Adequacy Reports and R-1 Reports for 2006-2021.

While the results shown in Table 2 are internally consistent, in that they relate the returns on U.S. rail operations to the scale of U.S. rail operations, they nonetheless ignore the fact that the networks of three of the Class I railroads—KCS, CP, and CN—contain significant mileage outside of the United States. For this reason, to assure the robustness of our results we conducted an alternative analysis using the natural logarithm of total system-wide route mileage as our measure of scale. The results of this alternative analysis are shown below in Table 3.

TABLE 3: REGRESSION ANALYSIS OF THE RELATIVE RETURN ON INVESTMENT ON SYSTEM-WIDE ROUTE MILES, 2006 – 2021

	(1)	(2)
VARIABLES	OLS Pooled	Railroad Random Effects
Natural Log of Systemwide Miles of Road	1.732**	1.733***
	(0.560)	(0.670)
Constant	-20.32***	-23.42***
	(5.332)	(6.046)
Observations	112	112
R-squared	0.459	
Year fixed effects	Y	Y
Year Range	2006-2021	2006-2021
Number of rr_id		7

Standard errors (in parentheses) are clustered at the railroad level.

*** p<0.01, ** p<0.05, * p<0.1.

Sources: STB Railroad Revenue Adequacy Reports and R-1 Reports for 2006-2021; Annual Reports for CN, CP, and KCS, 2006-2021.

As in Table 2, the first column of Table 3 presents results based upon an ordinary least squares estimator, while the second shows results based upon a panel data estimator accounting for possible random effects by railroad. Both specifications again include a full set of year fixed effects. In both regressions, the coefficients of system-wide route mileage are positive, and statistically significant. The route mileage coefficients in Table 3 are numerically larger, suggesting a stronger scale effect. We note that the dependent variable of the regressions whose results are presented in Table 3 is the same as that of the regressions described in Table 2.[26]

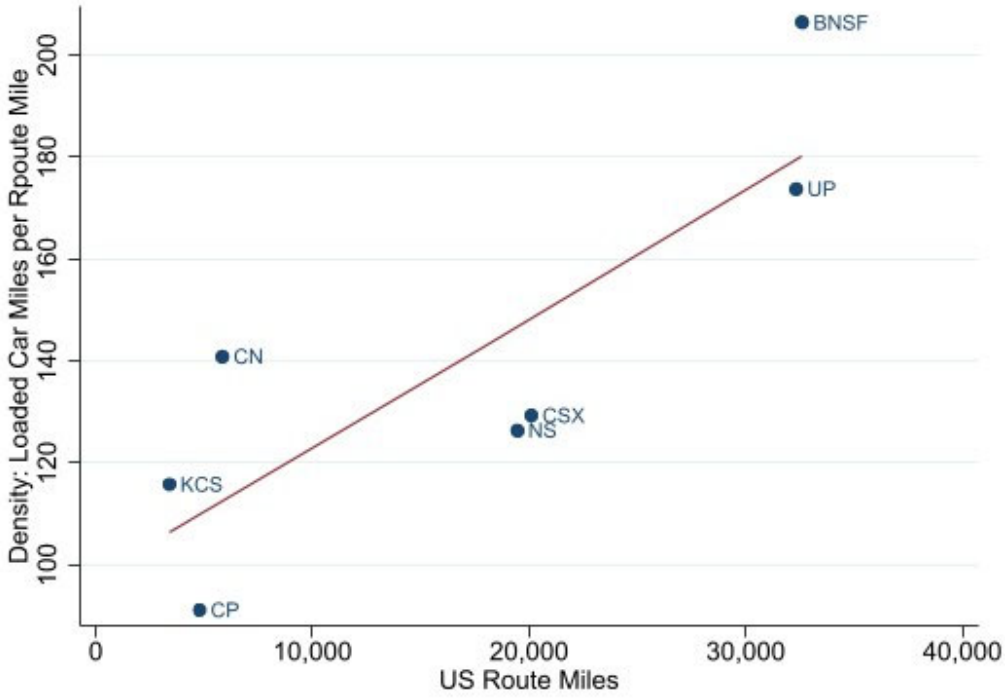
[26] In a sense, there is an inconsistency between the geographical definition of the dependent variable and the geographical definition of the route mileage variable used in the regression

What is the mechanism through which network size generates higher returns on investment? Gallamore and Meyer note that that the seven Class I railroads that had emerged from the late twentieth century merger wave "had experienced increased density and longer hauls as a result of mergers."[27] As indicated by Figure 8 and Figure 9, respectively, there is a strong cross-sectional relationship between each of these measures and the size of a railroad's network.

shown in Table 3. It would ideally have been preferable for these regressions to use a dependent variable based upon system-wide ROI. However, constructing such a dependent variable would have required detailed financial data for non-U.S. operations which were not readily available to us. For this reason, we regard the results shown in Table 3 as a confirmation of the validity of our Table 2 results.

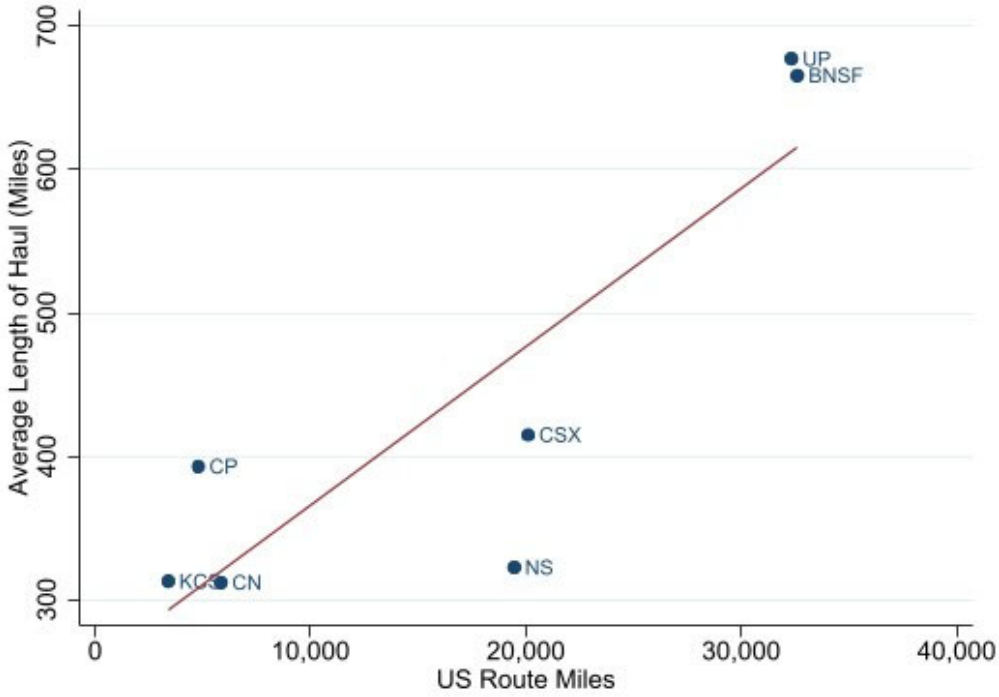
[27] Gallamore and Meyer, *supra* note 5, at 305.

FIGURE 8: TRAFFIC DENSITY AND U.S. NETWORK SIZE OF CLASS I RAILROADS, 2019



Notes and Sources: We define density as the number of loaded car miles per route mile. All data are sourced from 2019 R-1 reports as provided on the STB website. The patterns displayed by this 2019 graph are broadly representative of the relative magnitude of each railroad's traffic density and U.S. route miles for the last several years.

FIGURE 9: AVERAGE LENGTH OF HAUL AND U.S. NETWORK SIZE OF CLASS I RAILROADS, 2019



Notes and Sources: Average length of haul is calculated as the ratio between loaded car miles (as provided in 2019 R-1 reports) and total car-loads across all commodities (as provided in the Freight Commodity Statistics reports provided on the STB's website). The patterns displayed by this 2019 graph are broadly representative of the relative magnitude of each railroad's average length of haul and U.S. route miles for the last several years.

To further explore the relationships between these operational variables and railroad scale, we run two regressions. In both cases, the right-hand side specifications and estimation methods are identical to that described in Table 3 above. In one case, we take as the dependent variable the natural log of revenue car miles per route mile, a measure of traffic density. In the other, we take as the dependent variable the natural log of average length of haul. Results of these regressions are shown below in Table 4 and Table 5, respectively.

TABLE 4: REGRESSIONS OF TRAFFIC DENSITY ON U.S. NETWORK SIZE

VARIABLES	(1) Pooled	(2) Random Effects
Natural Log of US Miles of Road	0.748***	0.524***
	(0.177)	(0.126)
Constant	-2.558	-0.480
	(1.777)	(1.194)
Observations	112	112
R-squared	0.839	
Year fixed effects	Y	Y
Year Range	2006-2021	2006-2021
Number of rr_id		7

Standard errors (in parentheses) are clustered at the railroad level.

*** p<0.01, ** p<0.05, * p<0.1

Sources and notes: We define traffic density as the number of loaded car miles per route mile. All data are sourced from 2019 R-1 reports as provided on the STB website.

As indicated in Column 1 of Table 4, the relationship between traffic density (as measured by loaded car miles per mile of road) and railroad scale is consistently strong. The results there indicate that a railroad that is 10% larger has traffic density that is roughly 7.5% higher. The second column indicates that controlling for unobserved heterogeneity by employing a random effects estimator leads to similar conclusions, though the magnitude of the effect is smaller than in the pooled or ordinary least squares estimator. These results are generally consistent with the single-year scatter plot in Figure 8, and indicate that the general pattern in that chart consistently holds over the past 16 years.

Similarly, column 1 of Table 5 indicates that there is a strong relationship between railroad network size and average length of haul. However, controlling for unobserved differences in railroads by moving to a random effects estimator, as in column (2), indicates that, when a given railroad

increases its network size, it is not necessarily able to increase the average length of haul. This pattern of results implies that the correlation in column (1) of Table 5 may in fact be measuring railroad effects not necessarily related to size, while the high correlation between density and network size shown in Table 4 is more likely to be a function of actual size-related operational changes.

TABLE 5: REGRESSIONS OF LENGTH OF HAUL ON NETWORK SIZE

	(1)	(2)
VARIABLES	Pooled	Random Effects
Natural Log of US Miles of Road	0.267**	0.0675
	(0.0843)	(0.0498)
Constant	-3.356***	-1.485***
	(0.783)	(0.470)
Observations	112	112
R-squared	0.575	
Year fixed effects	Y	Y
Year Range	2006-2021	2006-2021
Number of rr_id		7

Standard errors (in parentheses) are clustered at the railroad level.

*** p<0.01, ** p<0.05, * p<0.1

Sources and notes: Average length of haul is calculated as the ratio between loaded car miles (as provided in 2019 R-1 reports) and total car-loads across all commodities (as provided in the Freight Commodity Statistics reports provided on the STB's website).

Returning to the OLS regression from Table 2, that set of results implies that, all things equal, a larger entity (the new CPKC) should in any given year have higher ROI than would the two smaller component railroads by themselves. All things equal, an entity the size of CPKC (assuming that there will be no retirement, abandonment or divestiture of lines post-merger) is predicted to have an ROI that is roughly 70 basis points higher than a railroad

the size of CP and roughly 145 basis points higher than a railroad the size of KCS. Those calculations, based on the OLS result from Table 2 and the 2021 STB-determined cost of capital, are presented in Table 6.

TABLE 6: ACTUAL AND PREDICTED ROI, USING 2021 DATA

	Predicted ROI	Actual ROI	Residual
	[1]	[2]	[3]
CP	11.34	13.51	2.17
KCS	10.63	8.25	-2.38
CPKC	12.08		

Sources and Notes: Based on the regression results displayed in column [1] of 6. For the "predicted" ROI for CPKC, we assume that the route mileage of the existing CP and KCS networks are combined, and that there is no post-merger retirement, abandonment, or divestiture of lines.

However, differences in the actual ROIs not captured by the regression analysis limit what can be said about the merged entity's probable ROI. For the last several years (dating back to 2015), CP has earned an ROI that exceeds the industry cost of capital while KCS has earned an ROI that falls short of this benchmark. In the target year 2021, the regression model under-predicts the ROI of CP and over-predicts the ROI of KCS, as demonstrated in columns [2] and [3] of Table 6.

These facts indicate that despite the high and persistent cross-sectional correlations between railroad network size and profitability, railroad specific factors other than size clearly influence economic performance in meaningful ways.

The existence of these persistent railroad-specific effects complicates the task of predicting the likely future economic performance of the merged CP/KCS. Will this new and larger railroad be more like the old CP, the old KCS or something in between? The answer to this question will depend on

which factors gave rise to the recent differences in ROI, how the integration process of the two railroads is handled, and what type of culture, management style and operating policies eventually emerge for the merged railroad. To illustrate the range of potential outcomes, the lower panel of Table 7 computes predicted 2021 ROI for the merged railroad under three alternative assumptions about what value its "unexplained residual" will take.

TABLE 7: ACTUAL ROI FOR CP AND KCS AND PREDICTED ROI FOR CPKC UNDER VARIOUS CONDITIONS

Actual 2021 ROIs		
CP	[A]	13.51
KCS	[B]	8.25
Predicted ROI for CPKC		
Using 2021 CP Residual	[C]	14.25
Using 2021 KCS Residual	[D]	9.70
Using Weighted Average Residual	[E]	12.49

Sources and Notes:

[A], [B]: STB Railroad Revenue Adequacy Report for 2021.

[C]–[E]: Based on the regression results displayed in column [1] of Table 27.

The first calculation, in row [C], assumes that the merged railroad will have a residual equal to that of CP in 2021. The second assumes it will have a residual equal to that of KCS in 2021. Finally, the third, in row [E], assumes a residual equal to a route-mileage-weighted average of the CP and KCS residuals. The actual 2021 ROIs for CP and KCS are repeated in the upper panel of Table 7 for reference. Under the first assumption, the merged entity earns a higher return than either CP or KCS earned in the same year. This result is to be expected, as it implies that the merged entity realizes the full benefits of whatever factors allowed CP to earn superior returns, plus the added benefits of greater network size. Under the other two assumptions, the merged entity earns a higher return than KCS actually earned, but a lower return than CP realized in the same year. In this scenario, the economic benefits of greater

network size are insufficient to offset the negative effects of the reduction in the unexplained residual relative to that of CP.

VI. Conclusion

The evidence presented and discussed above suggests that the railroad created by the merger of the CP and KCS railways should realize significant gains in efficiency, and as a result, produce higher returns on investment. Past experience with railroad mergers warns us to expect some difficulties as the two railroads integrate their networks, operations, staffs and support systems.[28] However, as those difficulties are resolved, we can expect longer term improvements in efficiency and economic performance.

Although the economic and statistical evidence suggests that the outcomes described above are the most likely, it is reasonable to consider how much confidence should be placed on these predictions. In this regard, some words of caution are warranted.

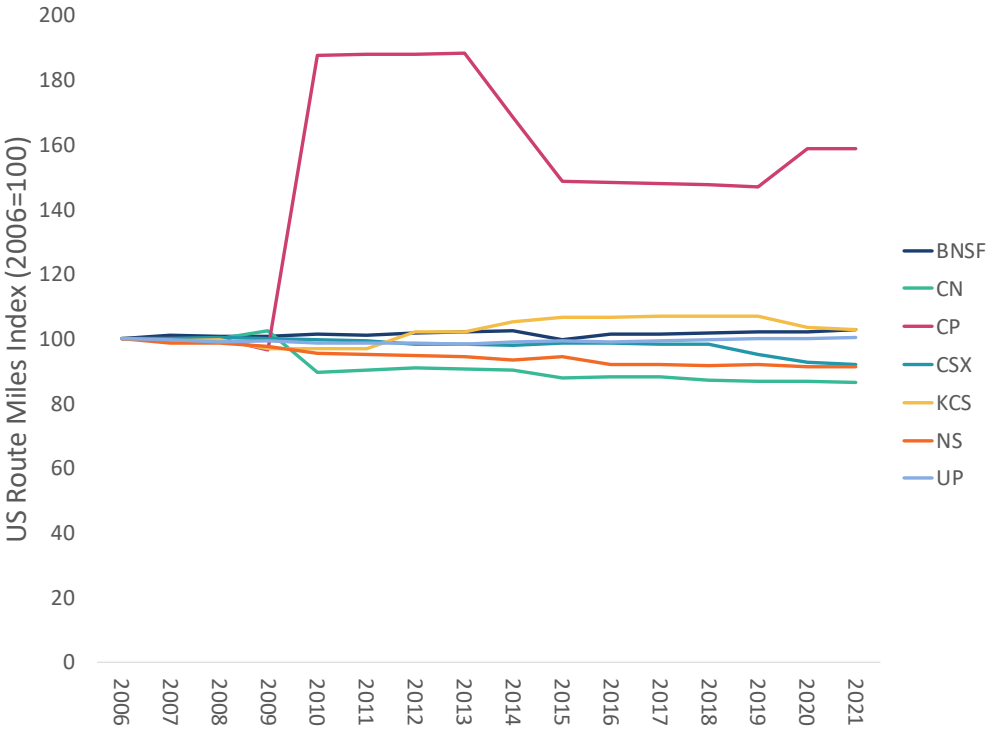
We have documented a number of ways in which important measures of railroad efficiency and economic performance are related to scale, as measured by route mileage. However, those results are driven to a very large extent by the substantial cross-sectional differences in route mileage that exist within the U.S. railroad industry. As shown in Table 1 above, in 2021 the U.S. route miles of the largest Class I railroad—BNSF—was more than 10 times that of the smallest—KCS. This cross-sectional variation is dramatically larger than the variation over time in route miles that we see in our data for any specific railroad. Figure 10 shows by railroad the relative changes in route miles that occurred over the 2006-2021 period. With the exception of CP, the networks

[28] "Public Views on Major Rail Consolidations." STB Ex Parte No. 582, Decided March 16, 2000, at 548: "the rail sector and the shipping public have been struggling to recover from the disruptions associated with the most recent round of mergers," which "have been accompanied by a number of serious service problems . . . service is clearly not where it should be." *See also id.* at 550: "Railroad CEOs involved in the last round of mergers testified how difficult merger implementation can be, even with the best planning and with the experiences of prior mergers to guide them."

of Class I railroads have shown little variation over the last 16 years.[29] A few small acquisitions increased route mileage for specific railroads. Small decreases resulted from abandonments and spinoffs. In magnitude, these changes are dwarfed by the large cross-sectional variation that existed throughout the period.

[29] The variation over time in CP's route miles is driven by a few key transactions. In 2009, CP acquired the Dakota, Minnesota & Eastern. Then in mid-2014, it sold roughly 660 miles of that subsidiary to the Genesee & Wyoming, while in the following year CP sold the 283-mile Delaware and Hudson line to NS. "Canadian Pacific 2015 Annual Report" at 32. Finally, in 2020, CP completed the acquisition of the Central Maine & Quebec. "Canadian Pacific 2020 Annual Report" at 8.

FIGURE 10: U.S. ROUTE MILES (INDEXED) OF CLASS I RAILROADS, 2006 – 2021



Indeed, variations on the regressions presented above indicate that within-railroad changes in network size during the time period analyzed have not had a statistically significant impact on ROI.[30] Given the limited *within-railroad* variation in miles of road (and consequently, in length of haul or traffic density over time), the inability to detect a meaningful effect of this size measure on performance is not surprising.

In addition, as the calculations discussed above indicate, non-size related persistent differences in ROI are quantitatively and economically

[30] Specifically, we use railroad fixed effects as an alternative to random effects to control for unobserved differences in railroads over time.

important. In terms of final outcomes, much will depend on whether the factors that have allowed CP to persistently earn higher than expected returns prove to be transferrable to the merged entity.

The seemingly inconsistent nature of these findings only highlights some of the earlier discussion. Lessons regarding the benefits of mergers witnessed during the first two decades following passage of the Staggers Act—when the industry was fundamentally different than it is now—are likely of limited use in predicting how CPKC's fortunes will differ from those of CP and KCS. At the same time, the changes to network structure and operations that have resulted from more recent events can only tell us so much about how the largest railroad acquisition in more than 20 years will affect performance and profitability.

Accordingly, the fact that our results are driven largely by cross-sectional differences in route mileage, and that the number of Class I railroads is small, means that some caution is warranted in interpreting our findings. The seven Class I railroads differ in many important ways other than route mileage. Their networks are structured differently. They carry different mixes of commodities. They operate across different types of terrain. And they serve different types of end points. The small number of Class I railroads make it impossible to control for all of these factors in a statistical analysis of profitability.

Hence, we must conclude that our findings are suggestive, rather than definitive. Optimism regarding the likely effects of this merger is warranted. But, we will have to wait and see.

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