THE COMPETITION TRIBUNAL

IN THE MATTER OF the *Competition Act*, R.S.C. 1985, c. C-34, as amended;

AND IN THE MATTER OF the acquisition by Parrish & Heimbecker, Limited of certain grain elevators and related assets from Louis Dreyfus Company Canada ULC;

AND IN THE MATTER OF an application by the Commissioner of Competition for one or more orders pursuant to section 92 of the *Competition Act*.

BETWEEN:

THE COMMISSIONER OF COMPETITION

Applicant

– and –

PARRISH & HEIMBECKER, LIMITED

Respondent

AFFIDAVIT OF NATHAN H. MILLER
(AFFIRMED/SWORN SEPTEMBER 04, 2020)

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1. My name is Nathan H. Miller. I am the Saleh Romeih Associate Professor at the McDonough School of Business at Georgetown University in Washington, DC. I earned my B.A. in Economics and History from the University of Virginia in 2000 and my Ph.D. in Economics from the University of California at Berkeley in 2008. I have served as a Visiting Professor at Toulouse School of Economics in 2019

and 2020. Prior to joining Georgetown University in 2013, I served as a Staff Economist at the U.S. Department of Justice from 2008 to 2013.

2. My area of expertise is in the field of Industrial Organization, which is the area of economics that addresses the behavior of firms, industries, and their markets. Within that field I have specialized in Antitrust Economics, with a recent focus on collusion and the competitive effects of mergers. I have taught graduate level courses on Microeconomics, Industrial Organization, Firm Analysis and Strategy, and Strategic Pricing. My research has been published in leading economics journals, including the *American Economic Review*, *Econometrica*, and the *RAND Journal of Economics*, among others. I serve on the editorial board of the *Review of Industrial Organization*.

3. In addition to my academic work in the area of Antitrust Economics, I have provided economic analysis for antitrust litigation matters. I served as a staff economist at the U.S. Department of Justice (DOJ), where I received an Award of Distinction for my work on a high-profile merger review. As a staff economist for the DOJ, I analyzed a number of merger matters across multiple industries, including Bazaarvoice/PowerReviews, AT&T/T-Mobile, and Ticketmaster/Live Nation. I have also analyzed the competitive effects of a merger on behalf of the merging parties, including the Express Scripts acquisition by Cigna. Finally, I have been retained by both the DOJ and Federal Trade Commission (FTC) as a testifying expert on several merger-related matters, and I worked with the Commissioner of Competition on the matter regarding Evonik Industries AG's acquisition of PeroxyChem Holding Company LLC.

4. I have been asked by the Commissioner of Competition to prepare a report examining the competitive effects and deadweight loss, if any, with respect to the acquisition of grain elevators and related assets from Louis Dreyfus Company by Parrish & Heimbecker, Limited.

5. I attach as Exhibit "A" to this affidavit my report setting out my opinion.

6. I attach as Exhibit "B" to this affidavit my curriculum vitae.

7. I attach as Exhibit "C" to this affidavit my Acknowledgement of Expert Witness.

8. I attach as Exhibit "D" to this affidavit my Documents Relied Upon.

AFFIRMED before me at the City of _____ on September ____, 2020.

_____
A Commissioner for Taking Affidavits, etc.

Nathan Miller
NATHAN H. MILLER

CT-2019-005

THE COMPETITION TRIBUNAL

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BETWEEN:

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Applicant

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PARRISH & HEIMBECKER, LIMITED

Respondent

AFFIDAVIT OF NATHAN H. MILLER
(AFFIRMED/SWORN SEPTEMBER 04, 2020)

Appendix A

THE COMPETITION TRIBUNAL

IN THE MATTER OF the *Competition Act*, R.S.C. 1985, c. C-34, as amended;

AND IN THE MATTER OF the acquisition by Parrish & Heimbecker, Limited of certain grain elevators and related assets from Louis Dreyfus Company Canada ULC;

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BETWEEN:

THE COMMISSIONER OF COMPETITION

Applicant

– and –

PARRISH & HEIMBECKER, LIMITED

Respondent

EXPERT REPORT OF NATHAN H. MILLER, PH.D.

September 4, 2020

Table of contents

1. SUMMARY OF OPINIONS

1. In December, 2019, Parrish & Heimbecker, Limited ("P&H")—a vertically-integrated Canadian agribusiness—acquired 10 grain elevators located throughout Western Canada from Louis Dreyfus Company ("LDC")—a U.S.-based conglomerate that processes and sells agricultural goods, as well as handles and trades grains.[1]

2. I have been asked "to provide independent expert economic opinion and analysis regarding this transaction." In particular, I have been asked to "prepare a report examining the competitive effects and deadweight loss, if any, caused by" the above transaction.[2] This report focuses specifically on P&H's acquisition of the previously LDC-owned elevator at Virden ("the Transaction").

3. After reviewing the available documents and data, I have concluded that the Transaction will have anticompetitive effects.

4. **First,** I find that the relevant product markets are the market for grain handling services for wheat and the market for grain handling services for canola, and the relevant geographic market consists of the Moosomin, Virden, and Fairlight elevators.

- Regarding the relevant product market, review of industry background and case documents shows that it is inappropriate to include the other services or business lines offered by the Moosomin and Virden elevators. (Section 3.1)
- Regarding the relevant geographic market, review of case documents, distances that farms tend to send their grain, distances between the

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[1] Brian Cross, "Elevator deal expands P&H handling network," *The Western Producer*, September 12, 2019, available at https://www.producer.com/2019/09/elevator-deal-expands-ph-handling-network/ ("The Winnipeg-based company announced last week that it reached a deal to acquire 10 Louis Dreyfus Commodities elevators located in Manitoba, Saskatchewan, Alberta and British Columbia. [...] LDC will retain its grain terminal in Port Cartier, Que., and a canola crushing plant and refinery in Yorkton, Sask. [...] which processes more than one million tonnes of canola annually.") (accessed on September 1, 2020); Louis Dreyfus Company, "Reports & Publications," 2019, available at https://www.ldc.com/news-and-insights/reports-and-publications/, p. 65 ("On December 10, 2019, LDC successfully completed the sale of ten grain elevators located in Canada to Parrish & Heimbecker, Limited.") (accessed on July 14, 2020); Dave Bedard, "P+H to buy Louis Dreyfus' Prairie elevators," AGCanada.com, September 4, 2019, available at https://www.agcanada.com/daily/ph-to-buy-louis-dreyfus-prairie-elevators ("The elevators run between 21,340 and 53,040 tonnes in capacity.") (accessed on July 14, 2020).

[2] I understand that the Commissioner has asked my opinion of the deadweight loss as it is relevant to responding to the efficiencies defense raised by P&H pursuant to section 96 of the Competition Act. See Letter from the Commissioner of Competition to Dr. Nathan Miller, "RE: The Commissioner of Competition v. Parrish & Heimbecker, Limited ("P&H"), CT-2019-005," August 27, 2020; Canadian Competition Act (R.S.C., 1985, c. C-34) Section 96, July 1, 2020.

elevators, and profit margins all suggest a candidate market consisting of the Moosomin, Virden, and Fairlight elevators. A hypothetical monopolist test confirms this geographic market. (Sections 3.1–3.2)

5. **Second,** I find that the post-transaction market shares clearly exceed the thresholds identified in the *Guidelines*—that the Transaction is on the side of that line identified with the possibility of competitive harm. (Section 4)

6. **Third,** I find that the price of grain handling services will likely increase. This conclusion follows from several analyses:

- A review of case documents establishes that farms view the Moosomin and Virden elevators as close substitutes and have benefitted from competition between them. (Section 5.2)
- Using a model of farms' elevator choices, I quantify the propensity of farms to substitute between elevators—including the extent to which farms view the Moosomin and Virden elevators as each other's next best substitute—using diversion ratios. I find that diversion ratios between the Moosomin and Virden elevators range between [redacted] and [redacted] for wheat and between [redacted] and [redacted] for canola. (Section 5.3)
- I use these diversion ratios to quantify the upward pricing pressure ("UPP") created by the transaction. The results suggest the transaction generates impetus for price increases, with UPPs of over [redacted]/metric tonne ("MT") for wheat and over [redacted]/MT for canola, and gross upward pricing pressure indices ("GUPPIs") of over [redacted] for wheat and over [redacted] for canola. (Section 5.4)
- A merger simulation model based on the model of farms' elevator choices predicts an increase in price of [redacted]/MT or [redacted] for wheat, and [redacted]/MT or [redacted] for canola. (Section 5.5)

7. **Fourth,** I find that the transaction will lead to an increase in deadweight loss. Specifically, the same merger simulation model shows an increase in deadweight loss of about [redacted] for wheat and about [redacted] for canola. Consumer surplus in particular—i.e., welfare for farms—will fall by about [redacted] for wheat and about [redacted] for canola. These effects are computed assuming elevators post their prices; given data limitations, this approach is appropriate even though there exists some evidence of price discrimination. (Section 5.5)

8. **Finally,** I find that Moosomin's [redacted] is consistent with the reduced incentives to compete as a result of the Transaction and may constitute an additional, unquantified negative effect for local farms and may contribute to additional, unquantified increase in deadweight loss. (Section 5.6)

2. INDUSTRY BACKGROUND ON GRAIN HANDLING SERVICES FOR CANOLA AND WHEAT

9. Parrish & Heimbecker, Limited ("P&H"), is a vertically-integrated Canadian agribusiness that is family-owned and operated. P&H operates four core business units: (1) Grain handling and trading;[3] (2) Crop inputs & services;[4] (3) "New-Life;"[5] and (4) P&H Milling group.[6]

10. Louis Dreyfus Company ("LDC") is a U.S.-based conglomerate that processes and sells agricultural goods, as well as handles and trades grains.[7]

11. In December, 2019, P&H acquired ten LDC grain elevators located throughout Western Canada, while LDC retained ownership of its Port Cartier grain terminal and Yorkton crushing plant.[8]

12. In this section, I provide an overview of the industry and describe how grains, namely canola and wheat, move from farmers to grain users, and the value added by elevators in the distribution process.

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[3] Parrish and Heimbecker, "P&H National Grain Asset Network," available at https://parrishandheimbecker.com/grain/ (accessed on September 1, 2020).

[4] Parrish and Heimbecker, "Crop Inputs & Services," available at https://parrishandheimbecker.com/crop-inputs-and-services/ (accessed on September 1, 2020).

[5] The New-Life Mills branch of P&H develops feed products for broiler chickens, turkeys, cattle, etc. See New Life Mills, "About," available at https://www.newlifemills.com/about/ ("New-Life Mills is a Canadian-owned manufacturer of livestock nutrition since 1964. With five production facilities and a dedicated team of experts in species management, nutrition and production, our commitment to the best possible inputs, feed, and services for; broiler chickens, eggs, turkey, beef, dairy, and swine, is the driving force behind our success. [...] New-Life Mills is a division of Parrish and Heimbecker, Limited and operates as the animal feed and farm division.") (accessed on September 1, 2020).

[6] Parrish & Heimbecker, Limited, "P&H Milling Group," available at https://parrishandheimbecker.com/ph-milling-group/ ("P&H is the largest Canadian-owned milling company. The P&H Milling Group sources wheat from Western Canada, Ontario, Quebec and Atlantic Canada to produce quality flour and cereal products.") (accessed on September 1, 2020).

[7] Russell, Robert S., and Davit Akman, "Proposed purchase by Parrish & Heimbecker, Limited of Certain Grain Elevators and Related Assets from Louis Dreyfus Company Canada ULC," August 29, 2019, pp. 1-40 at p. 11 ("In Canada, LDC is engaged in the grain handling and trading business, which involves the origination (purchase) and storage of grains at its grain elevators for marketing and sale to customers in Canada and export markets.").

[8] Brian Cross, "Elevator deal expands P&H handling network," *The Western Producer*, September 12, 2019, available at https://www.producer.com/2019/09/elevator-deal-expands-ph-handling-network/ ("The Winnipeg-based company announced last week that it reached a deal to acquire 10 Louis Dreyfus Commodities elevators located in Manitoba, Saskatchewan, Alberta and British Columbia. [...] LDC will retain its grain terminal in Port Cartier, Que., and a canola crushing plant and refinery in Yorkton, Sask. [...] which processes more than one million tonnes of canola annually.") (accessed on September 1, 2020).

2.1. The role of primary elevators in the supply chain of canola and wheat

13. The grain supply chain in Western Canada involves an interconnected network of businesses and infrastructure that moves grain from individual farms to end-customers such as companies that manufacture food, feeds, and biofuels.[9] In theory, farms could produce, clean, store, sell, and ship the grain directly to end-customers. In practice, farms specialize in farming and rely on other companies ("grain marketing companies"),[10] to invest in storage and cleaning facilities, develop the expertise in financial risks, identify end-customers, and arrange shipments, often overseas, that deliver the grain to those customers. The primary elevators that P&H acquired from LDC are one of the layers in this multi-layered supply chain.

14. Exhibit 1 displays the primary grain distribution channels in Canada. Most commonly, farms deliver their grain to a primary elevator operated by a grain marketing company. As of December 2019, evidence suggests that Canadian farms sold of the majority of their canola and wheat shipments to primary elevators operated by grain marketing companies, such as P&H.[11] Grain marketing companies do not just operate primary elevators. They generally employ traders that negotiate sales of grain with domestic and international purchasers and they arrange the shipping and other logistics necessary to move the grain taken in at primary elevators to its end use.[12]

15. Domestic purchasers of grain include feed users, which add grain as a source of protein in livestock and poultry feed, and processors (e.g., wheat mills and canola "crushers"), which transform the grain into a retail product.[13] Feed

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[9] Quorum Corporation, "Grain Supply Chain Study," September 2014, pp. 1-107 at pp. 10, 37–38 ("The Canadian grain supply chain is vast and includes many different businesses and interconnected infrastructure, and there are aspects that differentiate it from a typical supply chain. First and foremost is the separation of those controlling the production (farmers / producers) from those who manage and control the primary marketing and selling of grain to the end use customer (grain exporters and dealers).").

[10] In the schematic representation of the supply chain in Exhibit 1, these companies are labeled "Grain Companies Dealers/Traders" which reflects the fact that these companies differ in the degree to which they are vertically integrated into later stages of the grain distribution process. Prior to the Transaction, P&H and LDC both served as grain marketing companies available to farms in Manitoba and Saskatchewan.

[11] In Manitoba and Saskatchewan, primary elevators have the greatest grain capacity, at around 87 percent and 91 percent of total capacity, respectively, compared to process and terminal elevators. Canadian Grain Commission, "Grain Elevators in Canada, Crop year 2019-2020," December 1, 2019, pp. 1-72 at p. 9 "Table 1."

[12] Quorum Corporation, "Grain Supply Chain Study," September 2014, pp. 1-107 at p. 36 ("Many grain companies are fully integrated entities with processing divisions as well as export terminals and export marketing services.").

[13] Quorum Corporation, "Grain Supply Chain Study," September 2014, pp. 1-107 at pp. 37–38 ("The main domestic purchasers and users of Canadian grains are the processing and feed industries. The processing industry primarily consists of maltsters, millers, oilseed crushers and ethanol plants. [...] Feed wheat and barley,

users and processors appear in Exhibit 1 because some of them may also contract directly with some farms for delivery to their plants.[14] These plants maintain small elevators for that purpose; consistent with the Canadian Grain Act, I refer to the plant, together with its elevator, as a "process elevator."[15]

16. However, most Canadian grain is not consumed locally or even domestically. Canadian grain production far exceeds domestic demand.[16] In addition to facilitating domestic purchases, grain marketing companies provide access to vital international export markets. Farms are typically not equipped to trade widely and internationally.[17] Nevertheless, from August 2018 to July 2019, Canada exported at least 40% of its total canola production and 62% of its total wheat production.[18]

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corn, soybean and canola meal, distillers' grains and forage (hay or silage) may all be used [as sources of protein for livestock and poultry].").

[14] For example, farmer testimony confirms that several sell canola to canola crush plants, which are processors. See Witness Statement of [redacted], September , 2020, pp. 1-13 at p. 3 ("Over the last three years on average 30-40% of our canola sales have been split between Fairlight and Moosomin with the remaining canola being sold to the Louis Dreyfus crush plant in Yorkton, Saskatchewan (160 km away)."); Witness Statement of [redacted], August 7, 2020, pp. 1-7 at p. 3 ("I grow a variety of canola which is contracted through a crushing plant and they arrange "pick up" off farm as part of the contract.").

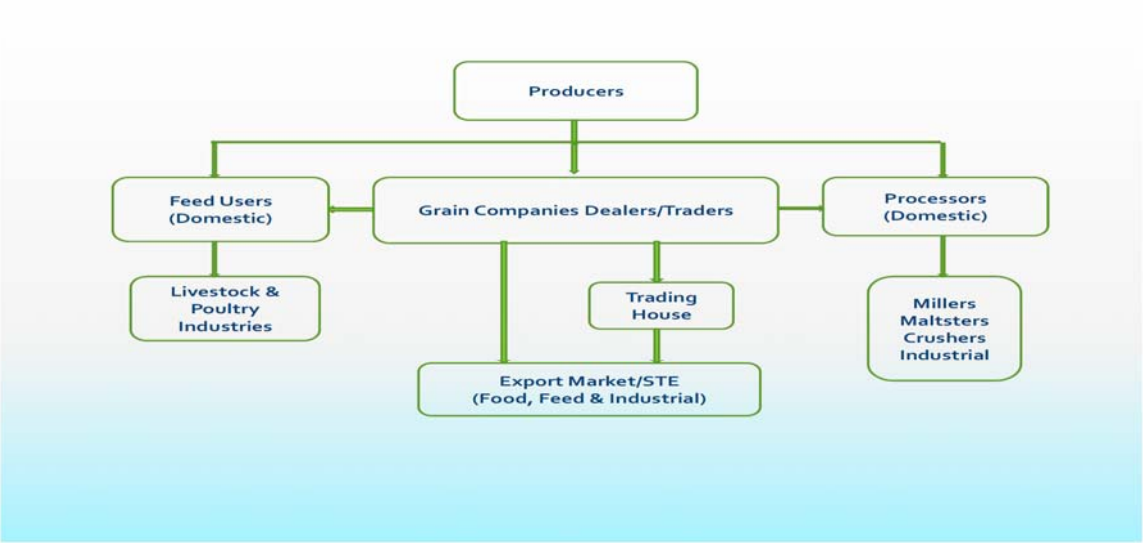
[15] Quorum Corporation, "Grain Supply Chain Study," September 2014, pp. 1-107 at p. 61 ("Most of the canola seed delivered to crushing facilities for processing is shipped by truck directly from producers with a small volume of seed arriving at crushing plants from primary elevators by rail."). Process elevators store grain used to manufacture goods and tend to have low storage capacity according to the Canadian Grain Commission. See Canadian Grain Commission, "Grain Elevators in Canada, Crop year 2019-2020," December 1, 2019, pp. 1-72, p. 9 "Table 1"; Canadian Grain Act (R.S.C., 1985, c. G-10), July 1, 2020, pp. 1- 75 at p. 5 ("process elevator means an elevator the principal use of which is the receiving and storing of grain for direct manufacture or processing into other products").

[16] Russell, Robert S., and Davit Akman, "Proposed purchase by Parrish & Heimbecker, Limited of Certain Grain Elevators and Related Assets from Louis Dreyfus Company Canada ULC," August 29, 2019, pp. 1-40 at p. 3 ("In 2018, Canada produced approximately 20.3 million tonnes of canola, 31.8 million tonnes of wheat (including durum), 8.4 million tonnes of barley and 3.4 million tonnes of oats. [...] Approximately 9.3 MT of wheat produced annually is sold to domestic end users.").

[17] As shown in Exhibit 1, farms do not interact directly with export markets. Quorum Corporation, "Grain Supply Chain Study," September 2014, pp. 1-107 at p. 30 ("The flow of grain that moves via Canada's west coast ports to global markets is the one that is most challenging for stakeholders as it must move through a few highly utilized port terminal elevators, particularly at Vancouver, which handles the great majority of this volume.").

[18] Note that the wheat percentage exported includes processed wheat products, but the canola percentages exported does not contain canola oilseed products. Statistics Canada (STC) and Agriculture and Agri-Food Canada (AAFC), "Canada: Grains and Oilseeds Supply and Disposition," May 22, 2020, available at https://aimis-simia.agr.gc.ca/rp/index-eng.cfm?action=pR&r=245&lang=EN (accessed on August 31, 2020). Russell, Robert S., and Davit Akman, "Proposed purchase by Parrish & Heimbecker, Limited of Certain Grain Elevators and Related Assets from Louis Dreyfus Company Canada ULC," August 29, 2019, pp. 1-40 at p. 3 ("Canada is the number one canola producing and exporting country in the world and produces about 13.8% of the world's wheat exports (by dollar value)."); Canola Council of Canada, "Industry Overview," available at https://www.canolacouncil.org/markets-stats/industry-overview/ ("Canada exports more than 90% of its canola as seed, oil or meal to 50 markets around the world, bringing billions of dollars into Canada.") (accessed on August 14, 2020).

EXHIBIT 1
Supply chain flow chart



Source: Quorum Corporation, September 2014, *Grain Supply Chain Study*

Note: While millers represent an alternative destination for wheat, just as crushers represent an alternative destination for canola, millers represent a much less important competitor in the wheat market. See Section 3.1.

17. Like most grains, the production of canola and wheat is constrained by harvesting cycles that do not mirror the steady demand for grain-based products and uses. Canadian farms typically plant the crop in April or May, take care of it during the summer, and harvest the grain between August and October.[19] Yet the demand from consumers of these grains does not necessarily follow the harvesting cycle, so some portion of grain production needs to be stored. Further, grain also needs to be stored, at least temporarily, to generate enough stock to be efficiently shipped in bulk.[20]

[19] Quorum Corporation, "Grain Supply Chain Study," September 2014, pp. 1-107 at p. 31 ("Harvest may occur between late August and October depending on the crop, location and weather factors."); Quorum Corporation, "Grain Supply Chain Study," September 2014, pp. 1-107 at p. 29 ("For most agricultural products in Canada, there is only one harvest each year and the decisions on what will be seeded can begin a year before the crop is harvested. In addition, prudent agronomic practices require good land stewardship through strategically managed actions such as crop rotation and planned application of crop inputs."); Province of Manitoba, "Agriculture Spring Wheat Production and Management," available at https://www.gov.mb.ca/agriculture/crops/crop-management/print,spring-wheat.html (accessed on September 1, 2020); Canola Council of Canada, "Time of Seeding," available at https://www.canolacouncil.org/canola-encyclopedia/plant-establishment/time-of-seeding/ (accessed on September 1, 2020).

[20] [redacted] Quorum Corporation, "Grain Supply Chain Study," September 2014, pp. 1-107 at pp. 44, 56 (" Effectively managing supply chain risk associated with more distant markets can involve capital expenditures for local storage capacity and increased working capital requirements for inventory management and infrastructure maintenance for both

18. As grain moves through the various distribution channels of Exhibit 1, it may be stored in a number of different kinds of elevators. Technically, an elevator is just one piece of the equipment involved in grain storage; however, the term may also encompass the entire grain-storage facility, which usually includes equipment to perform a number of other grain handling services.[21] These services, performed by elevator operators, are capital-intensive, require specialized expertise, and are important to preserving grain value. For example, raw grain with a high moisture content may spoil on its way from a primary elevator to a terminal elevator—"an elevator whose principal uses are the receiving of grain from another elevator and the cleaning, storing and treating of the grain before it is moved forward," usually located at ports.[22] Primary elevators are often equipped to dry the grain before storing and/or shipping it. Likewise, grain with a lower protein content or a slightly sub-optimal grade may require blending before reselling it in the domestic or international markets.[23]

19. Most of the farms I will be examining in this report ship their grain less than 100 kilometers to a primary elevator.[24] They would need to ship their grain at least 1000 kilometers to reach the nearest terminal elevator, Thunder Bay.[25]

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buyers and sellers. [...] The port terminal network provides a secondary warehousing role within the supply chain as bulk grains are stored in these terminals awaiting loading and dispatching of ocean vessels at the point of export.").

[21] Canadian Grain Commission, "Grain Elevators in Canada, Crop year 2019-2020," December 1, 2019, pp. 1-72 at pp. 4-5 ("In this Act, 'elevator' means (a) any *premises* in the Western Division (i) into which grain may be received or out of which grain may be discharged directly from or to railway cars or ships, (ii) constructed for the purpose of handling and storing grain received directly from producers, otherwise than as a part of the farming operation of a particular producer, and into which grain may be received, at which grain may be weighed, elevated and stored and out of which grain may be discharged, or (iii) constructed for the purpose of handling and storing grain as part of the operation of a flour mill, feed mill, seed cleaning plant, malt house, distillery, grain oil extraction plant or other grain processing plant, and into which grain may be received, at which grain may be weighed, elevated and stored and out of which grain may be discharged for processing or otherwise" [emphasis added]). Canadian Grain Commission, "Deductions for handling your grain," available at https://grainscanada.gc.ca/en/protection/delivery/deductions-handling-grain.html ("Elevators...can charge your for various grain handling services...including...cleaning...drying...blending.") (accessed on September 2, 2020).

[22] [redacted]
Canadian Grain Commission, "Grain Elevators in Canada, Crop year 2019-2020," December 1, 2019, pp. 1-72 at p. 9, "Table 1." Table 1 shows the vast majority of terminal elevators in British Columbia, Quebec, and Ontario, with Alberta and Saskatchewan having none and Manitoba having only one small terminal elevator, suggesting the terminal elevators are generally located in ports.

[23] Quorum Corporation, "Grain Supply Chain Study," September 2014, pp. 1-107 at p. 10 ("Market strategies for blending of grain to meet customer specifications require the segregation of grains in elevators either in the country or at port. Segregation activities can have inherently higher costs and therefore negative effects on the performance of the logistics system.").

[24] See Exhibit 7.

[25] See Workpaper 1. The minimum driving distance between Virden and the Thunder Bay terminal elevators present in my data is 1004 km. See also Quorum Corporation, "Grain Supply Chain Study," September 2014, pp. 1-107 at pp. 10, 53 ("Unlike many other competing countries where production is relatively close to export

Bypassing the primary elevators would considerably increase costs to these farms. They would need to coordinate truck and rail transportation and would forego the efficiencies of bulk shipments. They would also need to invest in equipment to prepare their raw grain for the long journey.[26] These costs would be prohibitive for individual farms in our data.[27]

20. Consequently, primary elevators play a unique and important role for Canadian farms, including those directly affected by the Transaction. Farms rely on these primary elevators and the grain handling services they provide as the farms could not achieve the same efficiencies in moving the grain from the farm to domestic and international markets. The remainder of my report focuses on the competition between *primary elevators*.

tidewater, in Canada the average rail haul from inland elevator to port is about 1,500 km. [...] The average railway loaded transit time for grain moving between primary and port terminal elevators in Western Canada was 6 days during the 2010-11 crop year.").

[26] As noted in the above paragraph, the grain must not have a high moisture content for rail transport.

[27] Witness Statement of Harvey Brooks, August 27, 2020, pp. 1-12 at p. 4 ("A producer could have received a price approximating the above price if they had been able to deliver a tonne of 1 CWRS 13.5 to the west coast on this date. For many reasons, it is not practical for a producer in Saskatchewan to deliver the grain themselves to a port in Vancouver."); Quorum Corporation, "Grain Supply Chain Study," September 2014, pp. 1-107 at p. 44 ("Effectively managing supply chain risk associated with more distant markets can involve capital expenditures for local storage capacity and increased working capital requirements for inventory management and infrastructure maintenance for both buyers and sellers."). While a single farm may not be large enough to erect full-scale primary elevator facilities on-site, [redacted] to construct one of their primary elevators. See Undertaking to John Heimbecker Examination for Discovery, July 15, 2020, pp. 1-313 at p. 15, found in the undertaking pp. 1-38 at p. 1 ("The estimated cost to build an elevator within compliance without a crop inputs component is in the range of approximately [redacted]. This estimate is based on the costs to build two recent elevators, one at Biggar and the other Gladstone without crop inputs retail capacity. [redacted]

2.2. Proximity is an important factor in a farm's choice of primary elevator

21. Farms will typically consider a number of factors in choosing among the nearby elevators.[28] Farms value the proximity of an elevator to the farm because it decreases farms' delivery costs,[29] and because they likely have more experience interacting with proximate elevators.[30] The most readily observable factors driving farms' decisions are the prices charged for grain handling services and the expected time and costs spent delivering the grain to each potential elevator.[31] I address the role of distance in the farm's choice of elevator overall, and in the context of the Transaction, throughout this section.

22. As a general matter, in industries where the supplied products or services are relatively homogeneous aside from location, suppliers' location relative to the consumer can greatly influence consumer decisions. Relative location is

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[28] One farmer testified that he considers four factors, including the distance to travel, delivery costs, pricing, the grade of his grain, and the delivery date. See Witness Statement of [redacted], September 3, 2020, pp. 1-13 at pp. 3-4 ("There are four main factors that I consider when making sales of my crop. The first, and most obvious, is price. Everyday most elevators will email or text pricing so that we can compare the different bids and weigh them against the cost to deliver to that particular location. [...] when an elevator can accept the grain. [...] grade of grain that I have to sell. [...] distance we have to travel to the elevator.").

[29] In their witness statements, farms describe the increased costs to transport their grain to farther away elevators. See Witness Statement of [redacted], September 3, 2020, pp. 1-13 at p. 4 ("However, the extra distance to Ceres means a higher transportation cost, so the bid has to be high enough to justify the extra delivery cost."); Witness Statement of [redacted], August 26, 2020, pp. 1-7 at p. 4 ("An elevator located farther than 50 miles would have to offer a significant premium to overcome the additional time and cost it would take to haul my crop that far.").

[30] Quorum Corporation, "Grain Supply Chain Study," September 2014, pp. 1-107 at p. 44 ("From a seller's [farm's] perspective markets that are local, or nearby, can be easily serviced by smaller firms. Buyers [grain marketing companies or elevators] in these markets tend to be easier to identify and cultivate while lot sizes tend to be smaller, transportation less complex and more easily accessible. There tend to be fewer trade barriers and phytosanitary standards are more likely to be low or non-existent making the management of risk easier and easing the administrative burden on the seller. All other things being equal—especially quality—buyers will often favor a local supplier."); Witness Statement of [redacted], August 19, 2020, ("I had a good relationship with the people at LDC as they were familiar with my grain and would not grade it as strictly as P&H. [...] As well, I don't want to have to leave my local area to start new relationships with different elevators that are a higher cost to get service from."); Witness Statement of Harvey Brooks, August 27, 2020, pp. 1-12 at p. 8 ("Some producers may try to maximize the price for their wheat by selling their full harvest to one elevator. By having a good relationship with one elevator, the producer may believe that they obtain some of the price and non-price benefits I described above.").

[31] See Appendix Section 6.1 for a discussion of the transaction and travel distance and time data. Farmers, in their witness testimonies, describe the price and distance trade-off explicitly. See Witness Statement of [redacted], August 11, 2020, pp. 1-7 at p. 4 ("Given the time and cost associated with hauling my grain, more distant elevators would have to offer a higher price for me to consider selling to them."); Witness Statement of [redacted], August 26, 2020, pp. 1-7 at p. 3 ("I choose where I will sell my crop based on a combination of the price an elevator offers for my crop and the distance to the elevator. For logistical issues, I try to sell most of my crop to P&H's elevator in Moosomin, SK which is located about 2 miles from my farm."); Witness Statement of [redacted], August 7, 2020, pp. 1-7 at p. 3 ("Due to the time and cost of hauling crop, I need an additional $0.25 - $0.30 cents a bushel to haul my crop an extra hour.").

particularly important to customers when transportation costs are high and the differences between the products or services across locations is small.[32]

23. With a few exceptions, primary elevators process and store grain using similar equipment before passing it on to the next stage of the supply chain.[33] Farms are responsible for transporting their grain to the primary elevator, and they may employ a commercial trucking company to load, ship, and unload their grain.[34] Paying by the tonne and kilometer or in the farmer's own time, these costs add up and can be a major consideration for the farms.[35]

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[32] Two examples of industries that have these properties are gasoline (Houde, Jean-Francois. "Spatial differentiation in retail markets for gasoline," *American Economic Review*, 102(5), 2012, pp. 2147-82) and cement (Miller, Nathan H., and Matthew Osborne, "Spatial differentiation and price discrimination in the cement industry: evidence from a structural model," *The RAND Journal of Economics*, 45(2), 2014, pp. 221-47).

[33] John Heimbecker Examination for Discovery, July 17, 2020, pp. 552-771 at pp. 731-735 ("... but an elevator can clean grain; is that correct? A. Like a country elevator has the ability to clean grain. [...] Q. Has the ability to dry grain; is that correct? A. Some do, some don't. Q. And a primary elevator can grade a farmer's grain? A. Well, yes. Q. And a primary elevator can also elevate a farmer's grain? [...] Q. Raise it into a storage bin? A. Right. Q. And an elevator can also store grain? A. Yes. Q. And an elevator can load grain on to a railcar to be shipped to another destination? A. Yes. [...] A. Well it's buying – the primary elevator buys the grain [...] [redacted]. Not all elevators offer the exact same services. For example, the Virden elevator did not have drying capabilities at the time it was acquired. [redacted]

[34] John Heimbecker Examination for Discovery, July 16, 2020, pp. 315-550 at pp. 330-331 ("Well, for one, the vast majority of farmers use commercial truckers. [...] They want to have the largest truck possible to be able to move the grain out. It's expensive for farmers to have an expensive truck so they use commercial trucking, plus the commercial truckers often help load the grain at the farm which farmers like."). Several farms testified that they are often able to truck their own grain in multiple loads, especially when the destination elevators are not located far away. See Witness Statement of [redacted], September 3, 2020, pp. 1-13 at p. 5 ("We are fortunate to own our own super b trailers so we can haul our own grain."); Witness Statement of [redacted], August 26, 2020, pp. 1-7 at p. 3 ("I haul 95% of my own crop to elevators using a 3-axle grain trailer and semitruck. I can haul an average load of approximately 31 metric tonnes. I prefer to sell to the Moosomin Elevator because it is so close."); Witness Statement of [redacted], August 7, 2020, pp. 1-7 at p. 3 ("I have a straight trailer that can only haul 26 tonnes at a time so it is not a good use of my time to haul my crop to more distant elevators. For example, I can haul approximately 4 loads a day in my trailer to Virden. By contrast, I could only haul 1 load per day to G3's elevator at Bloom.").

[35] Witness Statement of [redacted], August 7, 2020, pp. 1-7 at p. 3 ("The rates are to Portage $22/MT, to Kemnay $12.10/MT and Oakner $11.50/MT."). [redacted] The costs to haul grain with their own trucks are also factors that the farms consider. Witness Statement of [redacted], August 26, 2020, pp. 1-7 at p. 4 ("Currently my cost to ship grain is approximately $4.00 per metric tonne to locations under 10 miles away from my farm. The cost per metric tonne doubles when hauling to locations further than 30 miles away from my farm. [...] An elevator located farther than 50 miles would have to offer a significant premium to overcome the additional time and cost it would take to haul my crop that far."); Witness Statement of [redacted], August 7, 20, pp. 1-7 at p. 3 ("Due to the time and cost of hauling crop, I need an additional $0.25 - $0.30 cents a bushel to haul my crop an extra hour."); Witness Statement of [redacted], August 25, 2020, pp. 1-7 at p. 3 ("I own a Super B truck that I use to haul crop to grain elevators. It costs me approximately 25 cents per bushel to get my crop to Virden, Moosomin, or Fairlight. Transportation costs increase if I sell my crops to elevators farther away.").

24. Prior to the Transaction, P&H and LDC operated two elevators—Moosomin and Virden, respectively[36]—which span the Manitoba and Saskatchewan Provincial boundary and are located close to one another. These two elevators "draw" most of their grain from farms located in nearby Census Consolidated Subdivisions ("CCSs"),[37] the boundaries of which are less than 100 kilometers away from either elevator. The "draw area" is an industry delineation that describes the locations of farms from which the elevator expects to acquire most of its grain.[38] While the draw area does not appear to be a precise delineation, I use the available data to implement a similar concept for my competition analysis: An elevator's "service area" is the set of the closest CCSs from which an elevator draws at least 90% of their total wheat or canola intake.[39]

25. In Exhibits 2 and 3, I present the 90% wheat service areas for the Moosomin and Virden elevators, respectively. As illustrated in the Exhibits, these service areas are comprised mostly of those CCSs immediately surrounding the elevator. Comparing the two exhibits reveals that the Moosomin and Virden service areas largely overlap, suggesting that the two elevators expect to draw grain from similar or geographically clustered farms.

26. In contrast, the Bloom elevator (for example), which is located nearly 250 kilometers east of the Moosomin elevator,[40] exhibits a distinct service area that overlaps less with the Moosomin and Virden elevators' service areas.

[36] Described in Section 1, Parrish & Heimbecker, Limited owns the Moosomin elevator and the Louis Dreyfus Company formerly owned the Virden elevator.

[37] CCSs are administratively drawn boundaries that attempt to uniformly, spatially divide Canadian provinces. Appendix Section 6.1 describes how CCSs are drawn and how I use them to construct services areas for my competition analysis.

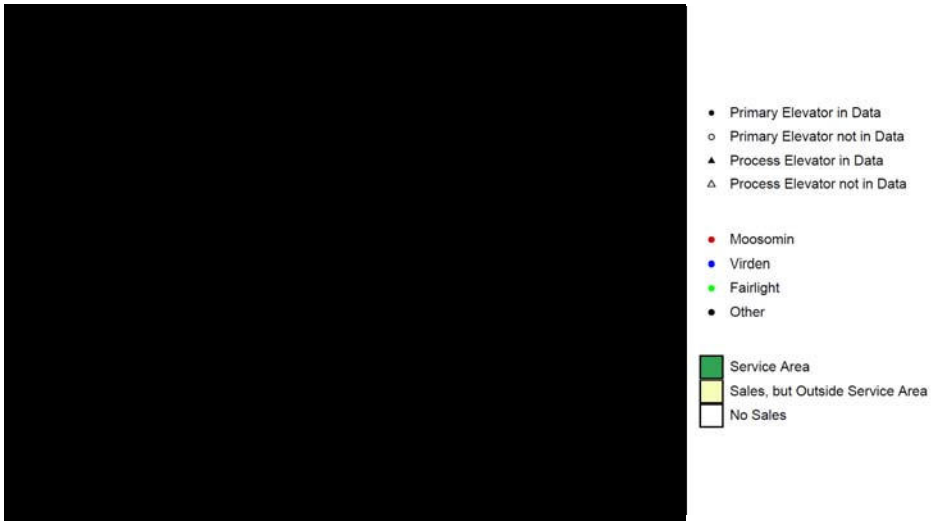
[38] [redacted]

[39] Refer to Section 3.2 describing the "relevant geographic market" and Appendix Section 6.1.3 for more details.

[40] See Workpaper 2.

EXHIBIT 2

90% wheat service area for the Moosomin elevator

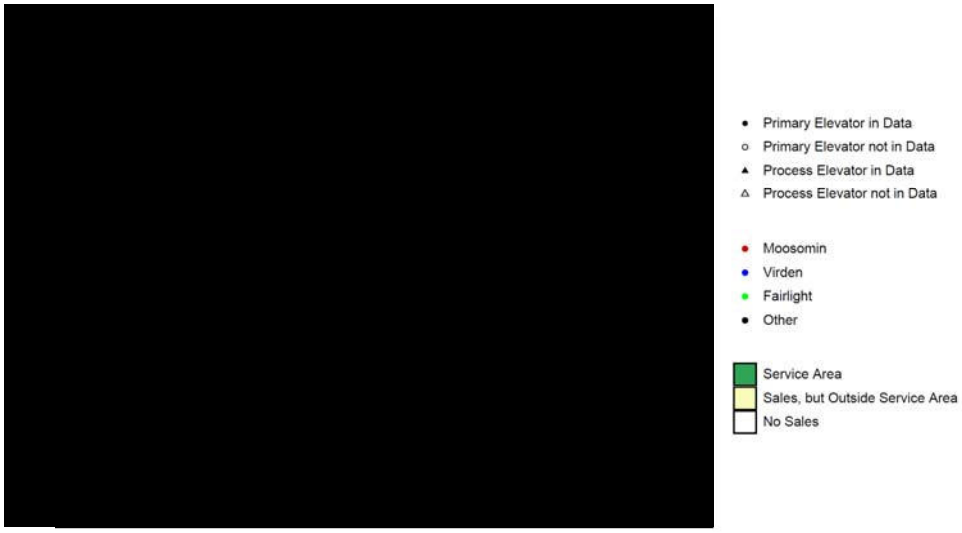


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to CWRS wheat transactions during August 2018–July 2019. The service area represents the closest CCSs to Moosomin that collectively form 90% of the total net quantity bought by Moosomin. Elevators shown are primary elevators and process elevators, which include crushers. The size of each elevator is proportional to elevator capacity. CCSs whose centroids are within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 3

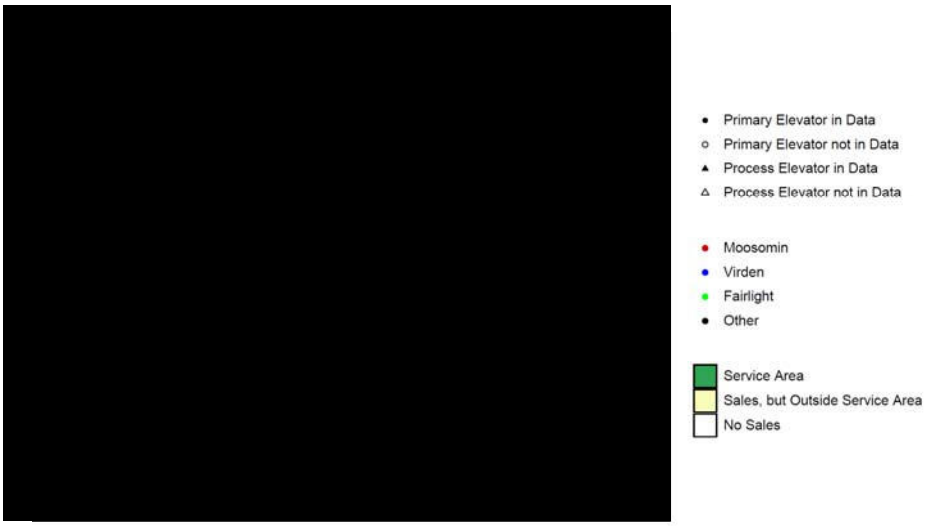
90% wheat service area for the Virden elevator



Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to CWRS wheat transactions during August 2018–July 2019. The service area represents the closest CCSs to Virden that collectively form 90% of the total net quantity bought by Virden. Elevators shown are primary elevators and process elevators, which include crushers. The size of each elevator is proportional to elevator capacity. CCSs whose centroids are within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 4
90% wheat service area for the Bloom elevator



Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to CWRS wheat transactions during August 2018–July 2019. The service area represents the closest CCSs to Bloom that collectively form 90% of the total net quantity bought by Bloom. Elevators shown are primary elevators and process elevators, which include crushers. The size of each elevator is proportional to elevator capacity. CCSs whose centroids are within 200 km from Virden or Moosomin are shown. The Bloom elevator is more than 200km from Moosomin and Virden and therefore is not shown on this map. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

27. Notably, each of the elevators' service areas comprises CCSs located near each elevator location, confirming that distance is important for farms' elevator choices.

28. Farms sometimes send grains directly to more distant canola "crushers,"[41] or facilities that process harvested canola seeds into oil and meal,[42] without enlisting a primary elevator. In Exhibit 5, I present the 90% service area for LDC's Yorkton canola crusher, which is located about 160 kilometers from the Moosomin elevator.[43] The median farm that sells to LDC's Yorkton crusher is [redacted] kilometers from Yorkton, while the median farm that sells to Moosomin

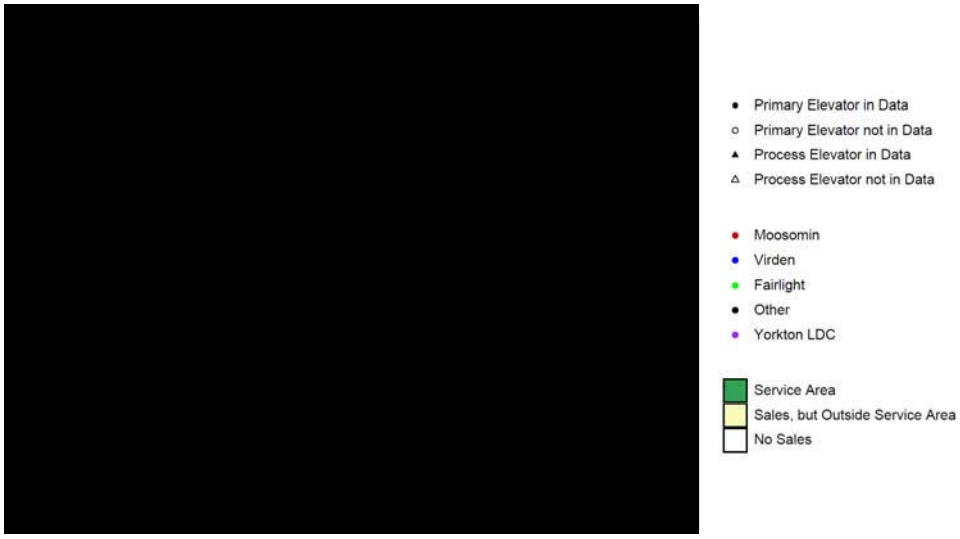
[41] Quorum Corporation, "Grain Supply Chain Study," September 2014, pp. 1-107 at p. 61 ("Most of the canola seed delivered to crushing facilities for processing is shipped by truck directly from producers with a small volume of seed arriving at crushing plants from primary elevators by rail."); Witness Statement of [redacted], September 3, 2020, pp. 1-13 at p. 3 ("Over the last three years on average 30-40% of our canola sales have been split between Fairlight and Moosomin with the remaining canola being sold to the Louis Dreyfus crush plant in Yorkton, Saskatchewan (160 km away).").

[42] Canola Council of Canada, "Industry Overview," available at https://www.canolacouncil.org/markets-stats/industry-overview/ ("Canada's canola processing industry transforms harvested seeds into oil and meal, which are then manufactured into a wide variety of products. Canada's 14 crushing and refining plants (mapped below) have the capacity to crush about 10 million tonnes of canola seed, and produce about 3 million tonnes of canola oil and 4 million tonnes of canola meal annually.") (accessed on September 1, 2020).

[43] See Workpaper 2.

is only [redacted] kilometers from Moosomin, and the median farm that sells to Virden is only [redacted] kilometers from Virden.[44] This suggests that farms may be more willing to travel farther distances to reach crushers. To the extent that prices offered at crushers may induce some farmers to forego the benefits of primary elevators and transport their canola farther distances, I will consider the possibility that canola crushers compete with primary elevators.

EXHIBIT 5
90% canola service area for LDC's Yorkton crusher



Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to canola transactions during March 2018–February 2019. Nexera and non-GMO canola are excluded. The service area represents the closest CCSs to Yorkton LDC that collectively form 90% of the total net quantity bought by Yorkton LDC. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. CCSs whose centroids are within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

2.3. The price farms pay for the handling services provided by the elevator are an offset to the price the elevator pays for the grain

29. As discussed above, realizing the grain's value hinges on executing a series of logistical and transactional steps that convey the grain from a farm to the end-customer. Because farms are not ordinarily equipped to directly supply grain to the swath of potential end-customers, they typically purchase grain handling services from a local primary elevator by accepting a discount on the grain's market value. Thus, the payment made from the elevator to the farm is

[44] See Workpaper 3.

the net of two prices reflecting the simultaneous exchange of two products – the elevator purchases the grain and the farmer purchases grain handling services.

30. Because these two products face different competitive conditions, the net price obscures an examination of the competitive effects for each product separately. The price of the grain depends on global market conditions and is typically reflected in contracts between farms and elevators by an index to the financial futures markets for that grain (Section 2.3.1). The price for grain handling services is where competition between local primary elevators can have an effect. This price is reflected in the "basis" – the difference between the futures price index and the payment the farmer receives in a typical contract (Section 2.3.2).

2.3.1. Futures market prices reflect the grain's value based on global supply and demand

31. Market prices for many commodities, such as grains, are ultimately set by global supply and demand. For example, wheat prices will depend on the global wheat production and inventory, as well as global demand, dictated by food and livestock feed manufacturers, as well as industrial users.[45]

32. The Minneapolis Grain Exchange trades "hard red spring wheat."[46] Trades on the exchange determine spot and future prices for the delivery of the wheat in Minneapolis.[47] These trades reflect fluctuations in the expectations of traders of the value of the specified wheat if the trader were to take possession on a specified day in Minneapolis. As such, these prices incorporate the market's information about supply and demand anywhere the wheat might be shipped, as well as the cost to bring the wheat from Minneapolis to any such point.

[45] Witness Statement of Harvey Brooks, August 27, 2020, pp. 1-12 at p. 3 ("[T]he price of wheat is driven by worldwide supply and demand factors such as climate/weather; global production, export and import competition; the price and availability of substitutes; relative crop economics; energy prices; policy; the uses of wheat as food, feed, seed and industrially; population growth; and dietary shifts.").

[46] [redacted]

[47] The futures market prices specify the grain be delivered on a particular date. See The Minneapolis Grain Exchange, Inc., "Hard Red Spring Wheat Futures Contract Specifications," available at http://www.mgex.com/contract_specs.html, (accessed on September 2, 2020).

Likewise, the ICE trades canola and specifies a global spot and future price for the delivery of canola in Saskatchewan.[48]

33. The value of canola delivered to a primary elevator in Saskatchewan or Manitoba is, therefore, identified by the ICE market prices for Saskatchewan deliveries. For wheat, there is potentially a question of whether the value of wheat in Minneapolis is noticeably different from the value of wheat at the actual elevators. This question amounts to asking if the expected cost to ship wheat from the elevator to end customers is noticeably different from the expected cost to ship it from Minneapolis. However, most wheat ships east or west to ports or ships to domestic customers, so the expected costs should be similar to the expected shipment costs from Minneapolis.[49] Moreover, if there were noticeable and persistent differences across the growing areas for this type of wheat, I would expect traders to recognize the arbitrage opportunity and to have set up a second market location in response to it. I am not aware of any notable wheat exchange in Saskatchewan or Manitoba, [redacted].

34. Consequently, these commodity market prices are a reliable measure of the price for the grain, and I will use them to separate the net payments to farms into the price of grain and the price of grain handling services.

2.3.2. The price of grain handling services reflects the local competitive conditions

35. Farms may contract with an elevator for delivery of grain months ahead of the actual delivery date.[50] These contracts usually identify a specific financial

[48] [redacted]

[49] Witness Statement of Harvey Brooks, August 27, 2020, pp. 1-12 at p. 3 ("The reference price indicating this international price could be considered to be the free on board ("FOB") price for a metric tonne (tonne hereafter) of wheat at a west coast terminal since the majority of Western Canadian wheat flows through west coast ports, especially the Port of Vancouver."); Quorum Corporation, "Grain Supply Chain Study," September 2014, pp. 1-107 at p. 57 ("However, these summary statistics understate the much higher than average utilization of the west coast elevators at Vancouver and Prince Rupert which had turnover ratios [ratio of grain throughput to storage] of 16 and 23 respectively in crop year 2011/12. These high rates of utilization were in contrast to the rates for elevators in Churchill and Thunder Bay which had ratios of 4.7 and 4.6 respectively."). In Section 2.5 below, I discuss the possible effects of an international trade shock that occurred in 2019.

[50] Witness Statement of Harvey Brooks, August 27, 2020, pp. 1-12 at p. 8 ("Many producers might forward contract perhaps 20-40% of their wheat over the course of the production and marketing year, though for some

futures market that will be used at a time related to the actual delivery to establish the value of the grain.[51] This practice of indexing the price to a futures market price reflects the fact that ebbs and flows in the worldwide grain market are outside the control of either the farm or the elevator. Importantly, the contract typically specifies a *level difference* between whatever the futures market price may be and the amount paid to the farm at the delivery date.[52] The industry refers to the price paid to farms as the "discounted cash price"[53] and to the difference between futures and cash price as the "basis."[54]

36. For farms that do not pre-commit to a contract for delivery, the prices follow this same pattern. The grain is valued using the relevant commodity market price, and the elevator deducts their current basis from that value to determine the payment to the farm. In either formulation, the basis is an offset against the price of grain that the elevator pays the farm, and in netting out payments, it is often referenced as a negative value to reflect that this payment is from the farm to the elevator.

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producers this could be lower or higher based on their understanding of markets, access to delivery opportunities and appetite for risk.").

[51] [redacted]

[52] [redacted]

[53] Witness Statement of [redacted], August 6, 2020, pp. 1-13 at p. 5 ("The elevator will also adjust its basis to reflect its need for grain. A wide basis (a greater *discount* and hence a lower price for my grain) means that the elevator does not need as much grain." [emphasis added]); Witness Statement of Harvey Brooks, August 27, 2020, pp. 1-12 at p. 4 ("The export basis essentially is the *deduction* grain elevators charge producers to get wheat from a prairie delivery point to market. This export basis is the difference between the price that the producer could get if they delivered their wheat directly to a west coast terminal and the price that the producer gets when they sell to a primary prairie elevator." [emphasis added]).

[54] [redacted]

37. For example, the relevant futures market price for a bushel of wheat may be $5.77 and the elevator might pay the farm a discounted cash price of $5.12, reflecting a basis of –$0.65, i.e., a price for the grain handling service of $0.65.

38. This framing is consistent with the elevator's role as an intermediary and the fact that some elevators are part of a vertically integrated grain marketing company. Depending on how integrated, the eventual point of sale for the grain could include multiple layers of additional services or it could be immediately after collection in the primary elevator. Separating prices into the price for each product or each layer of the supply chain focuses attention on the relevant competition at each level rather than introducing differences due only to the corporate structure.

39. For the remainder of this report, I will refer to the difference between the futures price and the price actually paid to the farmer, after converting both to the same currency, as the price of grain handling services.

40. The fact that this difference reflects the price for grain handling services is [redacted] For example, the basis will vary with the elevators' costs to provide grain handling services,[55] which depend on factors such as grain quality.[56] Grain quality factors include the grain grade,[57] moisture

[55] Witness Statement of Harvey Brooks, August 27, 2020, pp. 1-12 at p. 4 ("It represents the costs to the primary grain elevator for primary elevation and handling, rail transportation to port, terminal elevation and vessel loading plus an undefined risk premium and any profits captured by the grain elevator company"); Email from Norm Cobb, "Gain From Your Grain," September 13, 2018 [P&H_0004032] ("The basis reflects each grain company's own particular handling, transportation and marketing costs, combined with the bid values from their own end-use customers. Some farmers have asked why they can't book these futures values in their own pocket. The answer is that each grain company has its own cost structure to get your product to the marketplace or end user.").

[56] [redacted] Our analysis focuses on Canadian red spring wheat ("CRSW"), [redacted] (refer to Appendix 6.1.1). Within this classification, there are only three grades, thereby limiting the variation in grain quality observed in my data.

[57] Canadian Grain Commission, "Glossary," August 1, 2020, available at https://www.grainscanada.gc.ca/en/grain-quality/official-grain-grading-guide/27-glossary/glossary.html, ("A grading factor is a physical condition of grain, the result of growing conditions, handling procedures or storage practices. It is a visual characteristic that indicates a reduction in quality; for example, frost damage, sprouted kernels, or heated kernels. Only relevant grading factors are shown as reasons for a grade.") (accessed on August 18, 2020); Witness Statement of Harvey Brooks, August 27, 2020, pp. 1-12 at p. 4 ("The grade of wheat is determined by reference to standards set by the Canadian Grain Commission ('CGC'). First grade CWRS wheat (1 CWRS hereafter) is the highest quality of hard red spring wheat under the classification system set by the CGC."). [redacted]

content,[58] green count (specific to canola),[59] and protein content,[60] among others.[61] [redacted][62] and final prices will depend on the grain quality actually delivered to the elevator.[63]

41. The price of grain handling services reflects local market conditions including weather or road restrictions, storage and freight capacity constraints, and the potential (or likely cost) for a particular elevator to help meet the grain marketing companies' existing sales commitments.[64] Primary elevators under

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[58] Canadian Grain Commission, "Glossary," August 1, 2020, available at https://www.grainscanada.gc.ca/en/grain-quality/official-grain-grading-guide/27-glossary/glossary.html, (accessed on September 2, 2020) ("Moisture content is a measure of the water content of grain. Grain that is within acceptable limits of moisture is referred to as a straight grade. With increasing moisture content, grain may be referred to as tough, damp, moist and wet.") (accessed on September 2, 2020).

[59] [redacted]

[60] Reported as a percentage, protein content describes the amount of protein in the grain, wherein different levels of protein content facilitate processing to feed wheat (around 11 percent) and bread flour (around 12 percent), for example. See YARA, "How to increase wheat protein content," available at https://www.yara.com.au/crop-nutrition/wheat/how-to-increase-wheat-protein-content-and-quality/, (accessed on September 2, 2020). Elevators may offer higher prices for higher protein contents. [redacted]

[61] [redacted]

[62] [redacted]

[63] [redacted]

[64] [redacted] Witness Statement of Harvey Brooks, August 27, 2020, pp. 1-12 at p. 7 ("If two elevators are on the same rail line, this means that they may compete with each other to fill cars at the same time since the supply of cars can be constrained or rationed by the railroads at times."); Witness Statement of Harvey Brooks, August 27, 2020, pp. 1-12 at p. 10 ("[W]hen an elevator is capacity constrained the elevator company tends to increase the export basis they charge the producer and hence the amount the producer is paid for their wheat decreases."); [redacted] A farmer noted that seasonal road restrictions affect how much he is able to transport, increasing his costs to haul grain to the elevator. See Witness Statement of [redacted], August 19, 2020, pp. 1-9 at p. 3 ("Viterra Fairlight is located approximately 41km from my farm, however

pressure to meet near-term sales commitments with grain users may offer *lower* prices of grain handling services to farms, resulting in greater farm profits.[65] Conversely, primary elevators that lack freight and storage capacity may demand *higher* prices for grain handling services since there is less urgency to take in new grain.[66]

42. Local competition between primary elevators also affects the price for grain handling services. Primary elevators monitor competitors' prices and manage their own to stay competitive.[67]

43. In Exhibit 6, I summarize the price for grain handling services for wheat and canola from the elevator transaction data. The median prices for grain handling services of wheat and canola at Moosomin are [redacted] and [redacted], respectively, and at Virden they are [redacted] and [redacted] respectively. More

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between March and June there are weight restrictions on Road 60 making transportation more expensive. To keep under the weight restrictions, I would have to haul half of a load.").

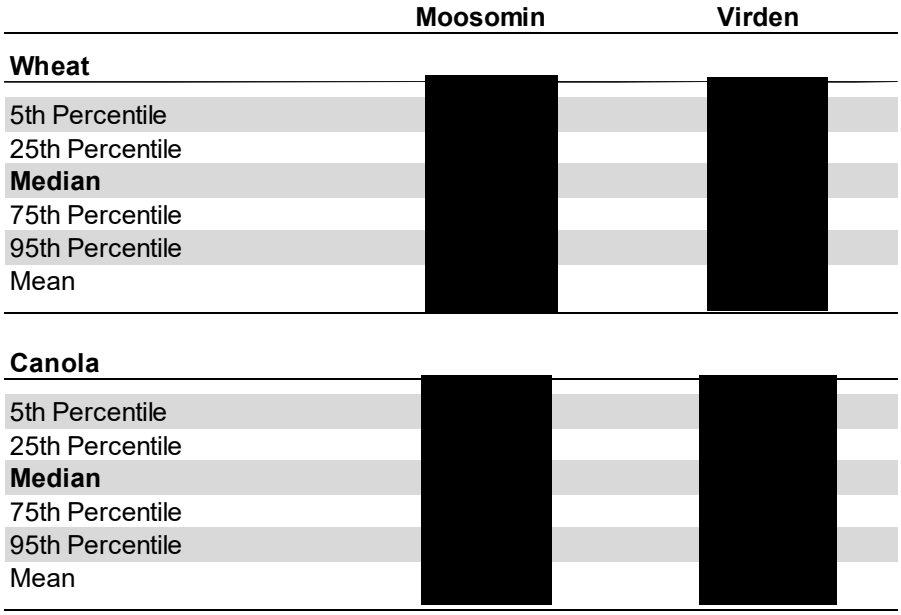
[65] [redacted]; Witness Statement of [redacted], September 3, 2020, pp. 1-13 at p. 6 ("As I described above, an elevator may offer me a better grade on borderline grain. Occasionally, a grain buyer from an elevator may email or text with special pricing if they need to obtain grain fast."); Witness Statement of Harvey Brooks, August 27, 2020, pp. 1-12 at p. 6 ("The grain company may adjust the export basis at each elevator it operates to ensure that they obtain the necessary volumes to profitably use the capacity at each elevator").

[66] Witness Statement of [redacted], September 3, 2020, pp. 1-13 at p. 5 ("This price is known as the basis which is essentially the amount deducted from the futures price to account for the elevator's costs of handling and shipping the grain to market. The elevator will also adjust its basis to reflect its need for grain. A wide basis (a greater discount and hence a lower price for my grain) means that the elevator does not need as much grain."); [redacted].

[67] [redacted]. See also Witness Statement of [redacted], September 3, 2020, pp. 1-13 at p. 6 ("Of course, elevators are also aware of each other's prices. It has been my experience that if an elevator knows that another elevator is currently competing for grain (for example, because they both have trains to fill) I will get a better price for my grain.").

details regarding how these prices were computed can be found in Appendix Section 6.1.

EXHIBIT 6
Summary statistics on the price of grain handling services



Source: LDC Transaction Data; P&H Transaction Data; Grain Elevators in Canada Data; Canada/U.S. Exchange Rate (DEXCAUS) Data; iVolatility Minneapolis Spring Wheat Futures Data; Capital IQ ICE Canola Futures Data

Note: Wheat transactions are from August 2018–July 2019; canola transactions are from March 2018–February 2019. All statistics are weighted by net quantity of grain sold and presented in CAD/MT. Analysis includes all farms that are within 600 km of Moosomin or Virden. The price of grain handling services is the difference between the price, on the day of delivery, of the benchmark futures contract and the transaction price. The transaction price for Moosomin and Virden is the net price, or the price that the farm actually received. The benchmark futures contract is the next one to expire, except that if the next futures contract expires in the same month as the transaction, the subsequent futures contract is chosen. All prices are converted to Canadian dollars.

2.4. Elevators effectively post their price for grain-handling services

44. Each day, the primary elevators typically post the prices at which they are willing to purchase each grain type, communicated through text blasts to farms or through phone app updates, for example.[68] The posted prices encompass the futures market prices for each grain type,[69] along with the price of handling the grain.[70] This level of posted-price transparency suggests that farms are capable of collecting the information from many elevators before sending their grain to a chosen elevator.[71] In the posted-price market, the *buyer* of grain handling services (or farm) knows the approximate crop specificity, quality, and quantity that will be harvestable throughout the season.[72] The *seller* (or elevator) acquires information about grain quality from nearby farms through regular grain sampling and testing,[73] discussions between farms and elevators'

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[70] ; Witness Statement of , September 3, 2020, pp. 1-11 at p. 5 ("This price is [...] essentially the amount deducted from the futures price to account for the elevator's costs of handling and shipping the grain to market.").

[71] Witness Statement of , August 25, 2020, pp. 1-7 at pp. 2-3 ("When selling wheat and grain, I regularly check the prices at the P&H elevator in Moosomin, SK, the Viterra elevator in Fairlight, SK, the elevator formerly owned by Louis Dreyfus in Virden, the Richardson Pioneer elevator in Kemnay, MB and the G3 elevator in Bloom, MB."); Witness Statement of Harvey Brooks, August 27, 2020, pp. 1-28 at p. 7 ("To start, producers may get price quotes and delivery offers for wheat from multiple elevators."); Witness Statement of , September 3, 2020, pp. 1-13 at p. 3 ("While every year is different depending on many factors, on average, over the past three years, we have sold approximately 35% of our wheat to Viterra at its elevator in Fairlight, SK (65 km away). Another 35% of our wheat has been sold to the P&H elevator in Moosomin (40 km away). The remaining 30% has been split between the Louis Dreyfus elevator in Virden (70 km away) and the Ceres elevator in Northgate (200 km away).").

[72] Producers even have access to pricing adjustments specific to grain quality.

[73]

customer service representatives,[74] and grain pricing orders ("GPOs").[75] Additionally, both the buyer *and* seller can monitor crop futures prices in real time, which are indicative of overall demand for the final commodity goods.

45. Elevators may not stick purely to the posted prices in that farms may sometimes individually negotiate their prices with elevators. Grain-price negotiations may depend on long-standing relationships and revenue-dependence,[76] as well as subjective assessments of whether a farm can credibly purchase grain handling services from another, competing elevator.[77]

46. [redacted][79]

[74] [redacted]

[75] [redacted]

[76] Elevators that depend on drawing large amounts of a high-quality grain from a single farm may be more willing to offer that farm special prices [redacted] Customer service representatives, for example, are tasked with reaching out to farms regularly. [redacted]

[77] See Pinkley, Robin L., and Margaret A. Neale et al.,"The Impact of Alternatives to Settlement in Dyadic Negotiation." Organizational Behavior and Human Decision Processes, 57(1), 1994, pp. 97-116 at p. 97 ("[D]ifferential power among negotiators (in the form of alternatives available to the individuals if the parties fail to reach a negotiated settlement) influences the parameters (e.g., the aspiration levels and reservation prices), the process, and the outcome of the negotiation [...] (a) the possession of an alternative increases one's own outcome as well as joint outcome; (b) the more attractive or valuable the alternative, the greater the benefits regarding own and joint outcome; and (c) the better one's own alternative relative to the other parties' alternative, the larger one's piece of the resource pie (i.e., one's benefit increases)").

[78] [redacted]

[79] Witness Statement of [redacted], August 19, 2020, pp. 1-9 at p. 5 ("I would get calls from Louis Dreyfus who would be in a rush to fill a train at Virden. In this situation I would call P&H Moosomin and use the two to

- [redacted][80]
- [redacted][81]
- [redacted][82]
- [redacted][83]

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negotiate a higher price than the current market price for the commodity. These negotiations have allowed me to obtain and additional $0.50 cents to $1 per bushel."). [redacted]

[80] [redacted] Witness Statement of [redacted], August 26, 2020, pp. 1-7 at p. 3 ("Occasionally my wheat or canola may need to be dried. Over the past two years I have had to dry or blend out approximately 1/3 of my annual wheat production. This is mainly done by our primary wheat buyer, P&H in Moosomin, at a negotiated rate."); [redacted]

[81] [redacted] Witness Statement of Harvey Brooks, August 27, 2020, pp. 1-12 at p. 6 ("Another way for a grain company to entice a producer to sell to its elevator is to adjust the grade of borderline quality wheat. The classification of wheat is not entirely objective. Some wheat may be considered on the low-end of Number 1 or the high-end of Number 2. The elevator company may have some ability to blend qualities together to achieve the higher grade on average and uses this at times to attract producer deliveries and at other times to increase profits."). [redacted]

[82] [redacted]

[83] [redacted]

47. Despite the evidence of some price discrimination in this market, a posted-price model is the most appropriate economic framework in this case for four reasons.

- **First**, the available data does not include information about a transaction's deviation from the posted price. The data also does not identify the characteristics that may have been considered in whether or how much discount to offer a specific farm.[84]
- **Second**, even when there is some price discrimination in the market, the posted-price model may approximate fairly well the *average* impact of the Transaction. In Section 5.4.1, I provide some evidence that the approximation is fairly accurate in the present setting.[85]
- **Third**, [redacted][86] [redacted], elevators largely expect to buy grain at the posted price, and the posted price model will most accurately capture the Moosomin and Virden elevators' pricing incentives post-Transaction.
- **Fourth,** data describing [redacted][88] Further, many of

[84] [redacted]

[85] Indeed, I examine the price impact of the Transaction under a specific type of price discrimination market and find that my results do not materially change.

[86] [redacted]

[87] [redacted]

[88] [redacted]

[redacted]

[redacted]

89 [redacted]

2.5. The international trade shock in March 2019 temporarily affected grain values and potentially disrupted competition for grain-handling services.

48. A natural starting point for analysis is to consider all transactions from a crop year together. A crop year starts in August of a given year and extends through July of the following year, and it is meant to reflect sales of grain associated with a particular harvest. For example, transactions from August 1, 2018 or July 31, 2019 are both assigned to crop year 2018–2019.[90]

49. However, in March 2019, an international trade dispute affected the value of grain, so I consider whether this exogenous shock affects the reliability of data from the most recent crop year.

50. For wheat, the effect of the trade dispute seems to have been similar for all of the elevators. Specifically, the Minnesota futures prices were depressed by lower expected exports from the US, stemming from a trade dispute with China.[91] Canadian exports were not affected to the same degree.[92] The transitory mismatch between the futures market value and actual values at the elevators would represent an exogenous shock to competition as the nominal price of grain handling services for wheat would likely need to adjust downward to reflect the mismatch. My model of competition can accommodate shocks of this sort as long as all of the market participants respond similarly to the shock—which appears to be the case for wheat.

51. For canola, the effect of the trade dispute on Canadian exports was different. Canadian exports of canola were significantly depressed, as China revoked Richardson's and Viterra's ability to export canola to China.[93] Unlike their

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[90] The Canadian Grain Commission defines the crop year this way, as seen in its weekly grain statistics that is publishes. For example, it defines the first two weeks of 2018 crop year as 8/1/18–8/12/18, and the last week as 7/22/19–7/31/19. Canadian Grain Commission, 2018–2019, Weeks 1 & 2 (gsw-shg-2-en.xlsx), Grain Statistics Weekly, available at https://www.grainscanada.gc.ca/en/grain-research/statistics/grain-statistics-weekly/ (accessed on August 16, 2020); Canadian Grain Commission, 2018–2019, Week 52 (gsw-shg-52-en.xlsx), Grain Statistics Weekly, available at https://www.grainscanada.gc.ca/en/grain-research/statistics/grain-statistics-weekly/ (accessed on August 16, 2020). I clarify throughout by using both years covered by the crop year (e.g., crop year 2018–2019).

[91] *Barchart*, "Spring Wheat May '19 (MWK19)," available at https://www.barchart.com/futures/quotes/MWK19 (accessed on September 2, 2020).

[92] CBC News, "Even as Beijing shuns Canada's canola, Canadian wheat sales to China soar," available at https://www.cbc.ca/news/politics/wheat-canola-china-canada-trade-1.5263313 (accessed on September 2, 2020).

[93] Canola Council of Canada, "Canola & China – What growers should know," available at https://www.canolacouncil.org/news-homepage/canola-china-%E2%80%93-what-growers-should-know/, (accessed on September 2, 2020); Email chain from Dave Mcdonald to Cam Durfey, "RE: priority list top 13," March 8, 2019 [P&H_0004919] ("Watch for news that Richardson has been banned from shipping Canola to China ...").

response to the wheat shock, the two elevators appear to have responded differently from each other to the depressed value for canola.[94] My competition model is not able to distinguish differences across market participants in how they reacted to a temporary exogenous shock from differences that reflect long-running competitive significance. Ordinarily, economists would expect trade to stabilize as suppliers and users equilibrate on new trade flows. Data from before the Transaction, however, ends soon after the 2018-2019 crop year, and so would fail to show the new, long-run equilibrium. Thus, starting in March 2019, the data I have is unreliable for competitive analysis of canola handling services.

52. Consequently, in my quantitative analyses in Sections 3, 4, and 5 below, I use the most recent crop year prior to the Transaction for wheat, but construct a 12-month period ending in February 2019 for my analysis of canola. As a check on my assumption that the data is reliable for analyzing grain handling services for wheat, I replicated my analysis for the preceding crop year (2017–2018) and found similar results.[95] I discuss the details of the data used and the steps for processing it in Appendix Section 6.1.

[94] See Workpaper 5.

[95] See Workpapers 6–8. My analysis using the most recent crop year is conservative, since the 2017-2018 crop year would have involved larger predicted price increases and consequently greater deadweight loss.

3. MARKET DEFINITION

53. A common theme in antitrust analysis is that mergers or acquisitions should not be permitted if they "are likely to create, maintain or enhance the ability of the merged entity, unilaterally or in coordination with other firms, to exercise market power... Market power of sellers is the ability of a firm or group of firms to profitably maintain prices above the competitive level for a significant period of time."[96] Market definition plays two essential roles in assessing how a merger changes the industry participants' abilities to exercise market power:

- **First**, it specifies the line(s) of commerce and geographic area(s) in which competitive concerns arise. It "identif[ies] the set of products that customers consider to be substitutes for those produced by the merging firms."[97] Then, the customers (in our context, farms) that might be harmed by the merger are those that might reasonably purchase any of the identified products.
- **Second**, it allows the identification of the industry participants and measurement of their market shares / concentration, and how such concentration changes after the merger.

54. Indeed, as described in the Competition Bureau's *Merger Enforcement Guidelines* ("*Guidelines*"):

> [I]nformation that demonstrates that market share or concentration is likely to be high is not, in and of itself, sufficient to justify a conclusion that a merger is likely to prevent or lessen competition substantially. However, information about market share and concentration can inform the analysis of competitive effects when it reflects the market position of the merged firm relative to that of its rivals.[98]

55. Defining a market "generally involves" identifying both a product market and a geographic market under the principles dictated by the *Guidelines*.[99] Conceptually, the goal is to identify a group of products or supply points within

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[96] "Market power of sellers is the ability of a firm or group of firms to profitably maintain prices above the competitive level for a significant period of time." Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 2.1, 2.3.

[97] Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 3.2.

[98] Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 5.8.

[99] Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 4.1

which a consolidation to monopoly would allow those products or supply points to exercise market power and harm customers by profitably imposing a small but significant and non-transitory increase in price ("SSNIP"). After one identifies those products or supply points, one can then assess the extent to which the transaction under review creates a similar type of industry consolidation by examining the combined share, within the identified group of products or supply points, of all products or supply points to be controlled by the acquirer after the transaction.

56. The *Guidelines* implement this goal by defining a relevant market as

> [T]he smallest group of products, including at least one product of the merging parties, and the smallest geographic area, in which a sole profit-maximizing seller (a "hypothetical monopolist") would impose and sustain a small but significant and non-transitory increase in price ("SSNIP").[100]

57. It is important to note that this definition recognizes the impracticality of including *all* sources of competition. The exercise of defining a relevant geographic market necessarily involves drawing a line beyond which additional competitive pressure can reasonably be excluded from the analysis. Otherwise, the chain of competitive interactions between each supply point and the one beyond it (and so on to the edges of the map) would introduce so much extraneous information as to make the investigation extremely burdensome while leaving unchanged the fundamental attributes of the competitive landscape. To prevent this, the *Guidelines* require only that "[a] relevant geographic market consist[] of all supply points that would have to be included for a SSNIP to be profitable [for a hypothetical monopolist]."[101]

58. In this section, I discuss why grain handling services for wheat and grain handling services for canola, provided by the Moosomin, Virden, and Fairlight elevators, constitute the relevant antitrust markets for the current matter.

- **First**, I discuss why grain handling services offered by the primary elevators constitute the relevant product market. Specifically, I discuss why it is inappropriate to include the other services or business line offered by the Moosomin and Virden elevators. (Section 3.1)

[100] Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 4.3.
[101] Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 4.17.

- **Second**, I describe how simple examination of locations and profit margins suggests that the set of the Moosomin, Virden, and Fairlight elevators is a candidate for the relevant geographic market. (Section 3.2)
- **Third**, I conduct a hypothetical monopolist test consistent with the *Guidelines*, and I find that the geographic market is no larger than the Moosomin, Virden, and Fairlight elevators; all wheat mills and crushers are more distant and so outside the relevant geographic market. (Section 3.3)

3.1. The relevant product markets are the market for grain handling services for wheat and the market for grain handling services for canola

59. Grain handling services include grading, segregating, cleaning, drying, blending, and storing grain.[102] As primary elevators, both the Moosomin and Virden elevators provide grain handling services for canola and wheat, among other grains.[103]

60. As discussed in Section 2.1, farms cannot rely on selling grains directly to processors and feed users because the demand from these channels may not align with when the grains are harvested. Several farmers note the importance of their limited on-site storage capacity in deciding when to sell their grain.[104] For example, [redacted] notes in a statement that he "has to sell approximately 25–30% of [his] crop at harvest time."[105] Additionally, as discussed in Section 2.1, Canadian production of wheat and canola far exceeds domestic demand, so farms require access to the export market.[106] In addition

[102] [redacted]

[103] Canadian Grain Act (R.S.C., 1985, c. G-10), Section 2, July 1, 2020 ("*primary elevator* means an elevator the principal use of which is the receiving of grain directly from producers for storage or forwarding or both"); Canadian Grain Commission, "Grain elevator data," available at https://www.grainscanada.gc.ca/application/GEICOWeb/GEICOSearch-en, accessed on August 28, 2020 (accessed on August 28, 2020).

[104] Witness Statement of [redacted], August 19, 2020, pp. 1-9 at p. 3 ("In particular, during harvest I will send approximately 75% of my crop directly from the field to LDC Virden so that I can avoid buying additional grain storage bins for my farm.").

[105] Witness Statement of [redacted] August 7, 2020, pp. 1-7 at p. 2.

[106] See Section 2.1; Canola Council of Canada, "Industry Overview," available at https://www.canolacouncil.org/markets-stats/industry-overview/ ("Canada exports more than 90% of its canola as seed, oil or meal to 50 markets around the world, bringing billions of dollars into Canada.") (accessed on September 1, 2020); World-Grain.com, "Canada's wheat production expected to increase slightly," May 8, 2020, available at https://www.world-grain.com/articles/13669-canadas-wheat-production-expected-to-increase-slightly, ("Wheat production is estimated at 33.8 million tonnes, up from an estimated production of 32.3 million

to storage and connection with the world market, farmers employ grain handling services to perform certain operations on the grain. For example, [redacted] discusses the need for drying services for canola and wheat.[107] For these reasons, farms typically rely on primary elevators for their grain handling services, including grain storage.

61. P&H and LDC, and many grain merchants in general, are partially vertically integrated entities that also engage in grain trading, among other activities.[108] While P&H maintains [redacted] represents a single relevant product market.[109] While the markets in a supply chain may be interconnected, the participants and competitive constraints at each stage are distinct. Both for an analysis of competition and for ordinary business decisions, obscuring those differences into one overarching market would be a bad practice.[110]

62. Furthermore, many other companies are engaged in only part of this pipeline. For example, after the Transaction, LDC still operates a crusher and a terminal elevator, but it has sold all of its primary elevators.[111] Additionally

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tonnes in 2019-20. [...] Total domestic consumption of wheat in 2019-20 is forecast at 10.6 million tonnes, an increase of 18%, driven by increased use of wheat as feed.") (accessed on August 18, 2020).

[107] Witness Statement of [redacted], August 26, 2020, pp. 1-7 at p. 3 ("Occasionally my wheat or canola may need to be dried. Over the past two years I have had to dry or blend out approximately 1/3 of my annual wheat production. This is mainly done by our primary wheat buyer, P&H in Moosomin, at a negotiated rate.").

[108] Russell, Robert S., and Davit Akman, "Proposed purchase by Parrish & Heimbecker, Limited of Certain Grain Elevators and Related Assets from Louis Dreyfus Company Canada ULC," August 29, 2019, pp. 1-40 at p. 5 ("Most Canadian grain companies, and all of the main players (with the exception of LDC*), are fully integrated entities with processing divisions as well as export terminals and export marketing services.").

[109] P&H describes [redacted] See Response of Parrish & Heimbecker, Limited - Schedule A, CT-2019-005, February 3, 2020, pp. 1-6 at pp. 1-2 [redacted]

[110] [redacted].

[111] Brian Cross, "Elevator deal expands P&H handling network," *The Western Producer*, September 12, 2019, available at https://www.producer.com/2019/09/elevator-deal-expands-ph-handling-network/ ("The Winnipeg-based company announced last week that it reached a deal to acquire 10 Louis Dreyfus Commodities elevators located in Manitoba, Saskatchewan, Alberta and British Columbia. [...] LDC will retain its grain terminal in Port Cartier, Que., and a canola crushing plant and refinery in Yorkton, Sask.") (accessed on September 1, 2020).

hedge funds trade in the financial markets but are not involved in the actual production or shipping of grain.

63. Finally, [redacted][112] Thus, for many reasons, it is inappropriate to characterize the entire "pipeline" as a single product market.

64. P&H's Response to the Competition Bureau's Notice of Application does not refute that wheat processors (e.g., mills) should not be included in an analysis of the relevant market.[113] Terminal elevators may be part of the relevant product market, but they are typically substantially farther away from farmers than primary elevators. This makes them a poor substitute for farmers, who have much less expertise in logistics than do grain marketing companies.[114] Additionally, the distance to terminal elevators suggests that even if they are part of the relevant product market, they are likely not part of the relevant geographic market.[115]

65. Whether canola crushers—particularly those mentioned in P&H's Response—are part of the relevant market is harder to determine.[116] Several farmers mentioned that they sell some of their crop to the Moosomin and

[112] [redacted]

[113] Notice of Application, Parrish & Heimbecker, Limited, December 19, 2019, pp. 1-12 at p. 8 ("Some farmers can sell their wheat and canola directly to processors in Western Canada such as canola crushing facilities. However, these facilities do not have the capacity to constrain Elevators from profitably imposing and sustaining a small but significant non-transitory increase in the price of Grain Handling Services for wheat or canola."); Response of Parrish & Heimbecker, Limited, CT-2019-005, February 3, 2020, pp. 1-11 at p. 6 ("In addition to rival Elevators, the Moosomin and Virden Elevators need to purchase canola at prices that are competitive with canola crushers located in Yorkton, SK, Harrowby, MB, Altona, MB and Velva, ND, as well as other direct purchasers.").

[114] See Section 2.1; see Workpaper 1.

[115] Quorum Corporation, "Grain Supply Chain Study," September 2014, pp. 1-107 at pp. 10, 53 ("Unlike many other competing countries where production is relatively close to export tidewater, in Canada the average rail haul from inland elevator to port is about 1,500 km. [...] The average railway loaded transit time for grain moving between primary and port terminal elevators in Western Canada was 6 days during the 2010-11 crop year.").

[116] P&H noted that the Moosomin and Virden canola prices need to be competitive with nearby canola crushers. See Response of Parrish & Heimbecker, Limited - Schedule A, CT-2019-005, February 3, 2020, pp. 1-6 at p. 3 ("In addition to rival Elevators, the Moosomin and Virden Elevators need to purchase canola at prices that are competitive with canola crushers located in Yorkton, SK, Harrowby, MB, Altona, MB and Velva, ND, as well as other direct purchasers.").

Virden elevators, with other portions transported directly to crushers.[117] However, other farmers reportedly avoid crushers because they require advance contracts or demand lower-quality canola, and instead, those farmers take advantage of grain handling services.[118]

66. The farmers' descriptions of their options are consistent with an economic tradeoff: selling to a crusher might be the best option in a given month, but it is only one option. To insure against the uncertainty that other options at other points in time may provide better value, farms want to work with a primary elevator and avail themselves of all the services and options a grain marketing company can provide. In the end, I will allow for the possibility that crushers may be in the same product market as grain handling services for canola, and all of my analyses respect the fact that farmers may choose to sell to crushers. However, I will show below that a narrower geographic market—one that does not reach the crushers—satisfies the usual test of market sufficiency for customers that are likely to choose between Moosomin and Virden.

3.2. Evidence from a simple examination of locations and profit margins suggests that the set of the Moosomin, Virden, and Fairlight elevators is a candidate for the relevant geographic market.

67. As discussed above, the process of establishing a relevant market begins with identifying a candidate market. In the present context, readily available evidence suggests such a candidate: the set of the Moosomin, Virden, and Fairlight elevators.

68. First, the available evidence shows that the Moosomin and Virden elevators are among each other's closest competitors. According to ArcGIS, the two

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[117] Witness Statement of [redacted] September 3, 2020, pp. 1-13 at p. 3 ("Over the last three years on average 30-40% of our canola sales have been split between Fairlight and Moosomin with the remaining canola being sold to the Louis Dreyfus crush plant in Yorkton, Saskatchewan (160 km away)."); Witness Statement of [redacted] August 7, 2020, pp. 1-7 at p. 3 ("I grow a variety of canola which is contracted through a crushing plant and they arrange 'pick up' off farm as part of the contract."). See also Quorum Corporation, "Grain Supply Chain Study," September 2014, pp. 1-107 at p. 61 ("Most of the canola seed delivered to crushing facilities for processing is shipped by truck directly from producers with a small volume of seed arriving at crushing plants from primary elevators by rail.").

[118] Witness Statement of [redacted], August 25, 2020, pp. 1-7 at p. 3 ("I do not usually sell to canola crush plants. Canola crush plants cover their demand around 5 months in advance. I have found that I risk missing out on better sale opportunities if I book sales this far out. I have not sold canola to a crush plant since 2016."); Witness Statement of [redacted], August 19, 2020, pp. 1-9 at p. 4 ("I do not sell to canola crush plants as it generally means that the quality of the canola isn't good.").

elevators are only 62 km driving distance apart, which represents about a 40-minute drive.[119] Exhibit 7 displays summary statistics regarding the distances and times farmers (or truckers they hire) typically drive to deliver their grain. It demonstrates that the 62 km between Moosomin and Virden is a reasonable distance for a farmer to deliver their grain. Furthermore, [redacted] [120] Therefore, as a candidate market, I assume that their relevant geographic markets include each other. The question, then, is how large a geography around these two elevators needs to be included in analyzing competition—i.e., is part of the relevant market.

[119] See Exhibit 8 and Workpaper 2.

[120] The *Guidelines* note that "[m]erger review is often an iterative process in which evidence respecting the relevant market and market shares is considered alongside other evidence of competitive effects, with the analysis of each informing and complementing the other" (Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 3.1).

EXHIBIT 7

Drive time and drive distance summary statistics

Drive Time from Farm to Elevator (minutes)

	Moosomin	Virden	Fairlight	All Other Primary Elevators	Crushers
Wheat					
25th Percentile	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Median	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
75th Percentile	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
90th Percentile	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mean	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Canola					
25th Percentile	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Median	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
75th Percentile	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
90th Percentile	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mean	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Drive Distance from Farm to Elevator (km)

	Moosomin	Virden	Fairlight	All Other Primary Elevators	Crushers
Wheat					
25th Percentile	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Median	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
75th Percentile	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
90th Percentile	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mean	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Canola					
25th Percentile	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Median	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
75th Percentile	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
90th Percentile	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mean	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Source: LDC Transaction Data; P&H Transaction Data; ADM Transaction Data; Bunge Transaction Data; Cargill Transaction Data; G3 Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Wheat transactions are from August 2018–July 2019; canola transactions are from March 2018–February 2019. All statistics are weighted by net quantity of grain sold. Analysis is limited to transactions within 600 km of Moosomin or Virden. Nexera and non-GMO canola are excluded. Only CWRS wheat is included. Drive times and drive distances were calculated as the time or distance between the farm and the the elevator location. Elevator longitude and latitude coordinates were taken from the Grain Elevators in Canada Data. The latitude and longitude coordinates for Melville and Velva, the two elevators that did not appear in the elevator location data, were determined using Google Maps. For the farms, the locations were determined as the centroid of the farm's postal code, or, if the farm's postal code was not available in the transaction data, the farm's town. Drive times and distances were calculated using ArcGIS software on August 18, 2020 at 14:51 CDT.

69. A standard practice of merger review is to ensure that relevant competition has not been excluded; thus, I consider other nearby elevators. Exhibit 8 contains the distances between the Moosomin elevator and other elevators, as well as the distances between the Virden elevator and other elevators.

EXHIBIT 8
Distances between the Moosomin and Virden elevators and other elevators

	Drive Time (min)		
Elevator	**From Elevator to Moosomin**	**From Elevator to Virden**	**Moosomin/Virden Average**
Virden	**36.1**	**–**	**–**
Moosomin	**–**	**36.4**	**–**
Fairlight	**27.1**	**41.4**	**34.2**
Whitewood	28.7	63.6	46.1
Oakner	71.6	38.9	55.3
Brandon Ht	76.4	43.7	60.1
Binscarth	58.1	64.2	61.1
Souris	83.6	51.0	67.3
Elva	86.0	53.3	69.6
Shoal Lake	78.0	61.5	69.7
Harrowby	66.2	82.6	74.4
Brandon	92.7	60.1	76.4
Carnduff	77.3	85.5	81.4
Minnedosa	111.9	80.8	96.3
Melville	91.6	126.5	109.0
Yorkton (LDC)	99.5	134.4	116.9
Yorkton (Richardson)	104.7	139.6	122.1
Bloom	143.1	110.4	126.7
Velva	291.6	166.6	229.1
Altona	252.8	220.2	236.5
Hanover Jct	339.7	374.7	357.2
Hamlin	363.7	398.7	381.2
Wilkie	370.9	405.8	388.4

Source: Elevators in Canada Data

Note: The latitude and longitude coordinates for Melville and Velva, the two elevators that did not appear in the elevator location data, were determined using Google Maps. Drive times were calculated using ArcGIS software on August 31, 2020 at 13:13 CDT.

70. The Fairlight elevator, operated by Viterra, is closer to the Moosomin elevator (27 minutes) than is the Virden elevator (36 minutes). Furthermore, Fairlight is closer on average than any other elevator to the Moosomin and Virden elevators, and likely represents the next closest substitute for customers who might otherwise be choosing between Moosomin and Virden.[121] Because

[121] It is also closer "as the crow flies" to the Virden elevator than is the Moosomin elevator. See Exhibit 16.

Fairlight is close to both Moosomin and Virden, I include this elevator in my candidate geographic market.

71. [redacted] that these elevators likely compete with each other and, therefore, collectively comprise a suitable candidate to test as a relevant geographic market. For example, [redacted][122] Similarly, [redacted][123] [redacted][124]

72. While there are other nearby elevators, [redacted] Appendix Section 6.4.1 discusses the calculation of margins in this context, and I find that the Virden elevator earns a [redacted] margin on grain handling services for canola and a [redacted] margin on grain handling services for wheat, both of which are [redacted] consistent with localized competition rather than significant competition from many distant competitors.[125] [redacted]

[122] [redacted]

[123] [redacted]

[124] [redacted]

[125] [redacted]

[redacted] suggest that a geographic market with few participants is likely correct.

73. Before moving on to a more formal verification that this candidate market represents a relevant antitrust market, I clarify one conceptual point: Naturally, the farms which are most likely to purchase grain handling services from these three elevators are located near them, as shown in Exhibit 7, and there is potential confusion over what this may mean for the bounds of the geographic market. To be precise, some farms considered in my formal verification of a relevant market and competitive effects analysis are located relatively far from Moosomin, Virden, and Fairlight. They might reasonably choose to send grain to an elevator outside the market. All of my analyses will respect this possibility; classifying such elevators as outside the market does not remove them from the menu of choices available to a farm. It does mean that analysis of competition can be done effectively without considering the strategic responses of these more-distant elevators.

3.3. A hypothetical monopolist test using a merger simulation model shows that the Moosomin, Virden, and Fairlight elevators comprise a relevant geographic antitrust market.

74. In this section, I formally test whether the Moosomin, Virden, and Fairlight elevators comprise a relevant geographic antitrust market. Consistent with the *Guidelines*, this test entails examining whether a hypothetical monopolist controlling the Moosomin, Virden, and Fairlight elevators would find it profitable to impose a SSNIP.

75. Analytically, this process begins with identifying an initial candidate market including at least one product sold by one merging firm.[126] As discussed in the previous section, I test a candidate market that includes the Moosomin, Virden, and Fairlight elevators. I then verify whether any of these elevators would find it profitable to impose a SSNIP if they were to combine to form a hypothetical monopolist.[127] This verification is often called a hypothetical monopolist test ("HMT").

76. If a hypothetical monopolist controlling the Moosomin, Virden and Fairlight elevators would find it unprofitable to impose a SSNIP, then some other elevators or crushers outside of the candidate market exert enough competitive pressure to be considered relevant to an analysis of competition. If, however, the hypothetical monopolist would find it profitable to increase price by at least a SSNIP, then the candidate market is sufficiently broad. Analysis of competitive effects within such a market can be performed effectively while holding constant the rest of the economy—including more distant primary elevators. When a candidate market fails the SSNIP test, the candidate market is usually expanded to include additional products and the HMT is performed again on the new candidate market. This process could continue until the hypothetical monopolist does find it profitable to impose at least a SSNIP.

77. To understand how the hypothetical monopolist test operates, consider our candidate market and the hypothetical monopolist's incentive to raise the price of grain handling services at the Moosomin elevator. Acting on its own, this elevator faces two consequences when it considers raising its price: Raising its price for grain handling services allows it to capture more revenue from farms that continue to purchase those services from Moosomin. On the other hand, raising its price would lead to some of its customers (farms) choosing a new

[126] Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 4.4.

[127] Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 4.4.

elevator, and Moosomin would lose the profits from their business. Moosomin's profit-maximizing price balances these two effects. However, when farms choose to use a new elevator, many of them will look to Virden or Fairlight. A hypothetical monopolist of all three, then, would have a different balance point as the "lost" sales to these other elevators would not truly be lost, but would instead just move revenue from one of its pockets to another.

78. An increase in the price of grain handing services at Moosomin would be profitable if the lost sales associated with such a price increase can largely be recaptured by the hypothetical monopolist—i.e., if most of the farms that respond to the price increase by seeking a new supplier would look to Fairlight or Virden. If, on the other hand, many such farms would decide to ship their grains to elevators or crushers outside the candidate market, then the hypothetical monopolist may not profitably impose a SSNIP.

79. The most formal way to perform this test is to directly compute the profit-maximizing prices a hypothetical monopolist would charge if it were to monopolize the candidate market of the Moosomin, Virden, and Fairlight elevators. As I will detail below in Section 5.5, I have developed a method for simulating the effects of mergers among primary elevators in this area. I use that method here to simulate a merger among all three elevators. Exhibit 9 shows the result—the predicted price increases of a hypothetical monopolist. The simulation demonstrates that a hypothetical monopolist of these elevators would increase price by far more than a typical SSNIP.[128]

[128] Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 4.3 ("Conceptually, a relevant market is defined as the smallest group of products, including at least one product of the merging parties, and the smallest geographic area, in which a sole profit-maximizing seller (a "hypothetical monopolist") would impose and sustain a small but significant and non-transitory increase in price ("SSNIP") above levels that would likely exist in the absence of the merger. In most cases, the Bureau considers a five percent price increase to be significant and a one-year period to be non-transitory.").

EXHIBIT 9
Hypothetical monopolist test

	Pre-acquisition Price	Hypothetical Monopolist Price	Change in Price ($)	Change in Price (%)
	[A]	[B]	[B] - [A]	([B] - [A])/[A]
Wheat				
Moosomin	[redacted]			
Virden				
Fairlight				
Canola Including Crushers				
Moosomin	[redacted]			
Virden				
Fairlight				
Canola Excluding Crushers				
Moosomin	[redacted]			
Virden				
Fairlight				

Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; 2018 and 2019 LDC P&L Statements; 2018 & 2019 LDC Throughput Data; Grain Elevators in Canada Data; Canada/U.S. Exchange Rate (DEXCAUS) Data; Bank of Canada Annual Average Canada/U.S. Exchange Rate Data; iVolatility Minneapolis Spring Wheat Futures Data; Capital IQ ICE Canola Futures Data; 2016 Census Program CCS Boundary Files

Note: The analysis for wheat runs from August 2018 through July 2019, and the analysis for canola runs from March 2018 through February 2019. Analysis limited to transactions in the 90% service area. Nexera and non-GMO canola are excluded. Only CWRS wheat is included. The 90% service area represents the union of the CCSs in the 90% service areas of Moosomin, Virden, or Fairlight. The 90% service area of each individual elevator represents the closest CCSs to the individual elevator that collectively form 90% of the total net quantity bought by the individual elevator. The canola crushers in the data are ADM's Velva, Bunge's Altona and Harrowby, LDC's Yorkton, and Richardson's Yorkton canola crushers. Specification, calibration, and simulation of the merger simulation model are described in Section 5.5 and are based on the farm choice model (Section 5.3.1). Fairlight's prices are not determined in levels due to lack of net price data, so only change in price is presented.

4. THE POST-TRANSACTION MARKET SHARES ARE SUFFICIENTLY HIGH AS TO PRESENT THE POSSIBILITY OF COMPETITIVE HARM

80. In the preceding section, I discussed why a market comprised of grain handling services at the Moosomin, Virden, and Fairlight elevators constitutes a relevant antitrust market. Having defined the market, in this section I assess the market shares and market concentration within the relevant market. While market shares and concentration are not on their own sufficient to determine the competitive effects of a merger, the *Guidelines* specify that

> ... information about market share and concentration can inform the analysis of competitive effects when it reflects the market position of the merged firm relative to that of its rivals. In the absence of high post-merger market share and concentration, effective competition in the relevant market is generally likely to constrain the creation, maintenance or enhancement of market power by reason of the merger.[129]

81. I compute market shares for the relevant market—that is, shares for the three elevators that are part of the relevant geographic market—and, in doing so, I include purchases at those elevators from any grower, regardless of where the farm is located.

82. Exhibit 10 reports market shares in terms of metric tonnes.

EXHIBIT 10
Market shares

Grain	Moosomin Share	Virden Share	Combined Moosomin/Virden Share
Canola	[redacted]		
Wheat			

Source: LDC Transaction Data; P&H Transaction Data; Viterra Transaction Data; Elevators in Canada Data

Note: The analysis for wheat runs from August 2018 through July 2019, and the analysis for canola runs from March 2018 through February 2019. Analysis limited to transactions within 600 km of Virden or Moosomin. Only CWRS wheat is included. Nexera and non-GMO canola are excluded. Market shares are weighted by metric tonnes and calculated among the Moosomin, Virden, and Fairlight elevators - the relevant geographic market.

[129] Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 5.8.

83. I find that the Transaction clearly exceeds the threshold of 35% mentioned in the *Guidelines* as a safe harbor metric. Specifically, the *Guidelines* state that a merger is unlikely to have anti-competitive consequences due to unilateral exercise of market power if the post-merger market share of the merged firm would be less than 35%.[130] In the present case, within the identified geographic market, the Moosomin and Virden elevators together capture over half of the volume for grain handling services for canola and wheat ([redacted] and [redacted], respectively). [redacted]

84. Furthermore, the *Guidelines* state that a merger is unlikely to have anti-competitive consequences due to coordinated exercise of market power if "the post-merger market share accounted for by the four largest firms in the market...would be less than 65%; or the post-merger market share of the merged firm would be less than 10%."[131] [redacted]

[130] Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 5.9.

[131] Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 5.9.

5. AN ECONOMIC ANALYSIS OF COMPETITIVE EFFECTS SHOWS LESSENING OF COMPETITION

85. In the preceding section, I discuss how the Transaction leads to market shares that exceed the 35% threshold. As noted in the Guidelines, however, "market shares or concentration that exceed these thresholds are not necessarily anti-competitive." In this section, I discuss how eliminating competition between Moosomin and Virden led to enhanced market power and overall welfare loss.[132] In particular, I show below that the Transaction likely increased the price of grain handling services in this market, reduced the quantity of grain handling services in this market, increased deadweight loss. Specifically, I employ the following evidence and analyses to draw this conclusion:

- **First**, I explain in general and intuitive terms why a merger between two close competitors can harm customers and overall welfare. (Section 5.1)
- **Second** [redacted] (Section 5.2)
- **Third**, I quantify the extent to which farms view the Moosomin and Virden elevators as each other's next best substitute using diversion ratios, and I find that many farms view the two elevators as close substitutes. (Section 5.3)
- **Fourth**, I use these diversion ratios to quantify the upward pricing pressure ("UPP") created by the Transaction. The UPPs for wheat are both [redacted] while the UPPs for Moosomin for canola are [redacted] (Section 5.4)
- **Fifth**, I use a merger simulation model to more precisely quantify the price impact of the Transaction as well as the welfare loss, and I find that the Transaction likely led to [redacted] (Section 5.5)
- **Finally**, a merger between close competitors reduces P&H's incentive to invest in cost-saving, welfare-enhancing measures at the Moosomin and Virden elevators. Indeed, economic theory suggests that [redacted] which would have benefited farms through lower prices for grain handling services, is consistent with such a reduced incentive. (Section 5.6)

[132] In the models I employ in this section, there are no income effects, which means that overall welfare loss is equivalent to the increase in deadweight loss.

5.1. A merger between two close competitors can harm customers and overall welfare.

86. As discussed previously in Sections 3 and 4, a focus of merger antitrust analysis is the extent to which the merger allows the combined entity to exercise market power. Economic theory indicates that a merger between substitutes, such as the Moosomin (P&H) and Virden (P&H, formerly LDC) elevators, can lead to less favorable pricing terms for farms and ultimately harm them. In this section, I discuss in detail the intuition behind that conclusion. The *amount* of harm depends on the degree of substitutability, which I quantify in Sections 5.3, 5.4, and 5.5.

87. In a posted-price market—the model which I have been using to analyze this market—an elevator faces a trade-off when it decides to raise its prices for grain handling services. On the one hand, higher prices increase revenue earned from farms that continue to purchase from the elevator—that is, farms that do not respond by purchasing grain handling services from an alternative elevator, or foregoing grain handling services by selling to a crusher or similar. On the other hand, some farms indeed switch away as a result of the higher price, and the elevator loses all profit from those farms. In general, a profit-maximizing firm ultimately balances these two considerations when deciding its optimal pricing strategy.

88. A merger alters one side of this tradeoff. Specifically, after the merger, the merged firm takes into account that it recaptures some of the lost profit from farms that leave, because some will switch to the recently acquired elevator. In this context, prior to the merger, Moosomin would have lost some farm sales to Virden had it raised its price. While it may have lost farm sales to other elevators, as well, the value of those lost to Virden actually changes with the merger. After the merger, these farms are not *lost* since P&H recaptures the sales diverted to Virden. Consequently, the merger eliminates some of the competitive pressure exerted on Moosomin's price.

89. This change in incentives leads to higher prices for grain handling services at the Moosomin and Virden elevators, which in turn would likely have a number of effects.

90. First, and most apparently, elevators—especially the Moosomin and Virden elevators—are better off than before the Transaction. They are able to impose a portion of the price increase that a hypothetical monopolist over the whole

market would have imposed. As their prices get closer to the monopoly price, their profits increase as well.

91. Second, the elevators' increase in profit comes at the expense of farms—especially those most likely to purchase from the Moosomin and Virden elevators—which are worse off than they were before the Transaction. Some will simply absorb the higher price of grain handling services, leaving them with a smaller return on their investment in growing the crop. The downward slope of demand means that some customers will respond to a price change by buying less of the product. In this case, that means that some farms will purchase less grain handling service from the Moosomin, Virden, and Fairlight elevators.

92. These lost transactions reflect an inefficiency caused by market power: Some farms are willing to pay more than the service would cost the elevator to provide, but less than the elevator charges, and so do not purchase. The potential benefits of purchases that do not happen due to the exercise of market power are a loss to the economy, and are referred to as the deadweight loss of imperfect competition. A merger that raises the profit-maximizing price in a market increases the deadweight loss.

93. It should be noted that my analysis, as well as the deadweight loss concept just described, are measuring the effects of competition in a static, partial-equilibrium context. That is, the analysis focuses on the effects of competition in a specific market—the market for grain handling services (for canola or wheat) at the Moosomin, Virden, and Fairlight elevators—while the rest of the economy is held constant. This common practice allows me to identify and measure the effect of a change in competition. After this initial impetus, the efficiency implications begin to ripple through the choices of the affected market participants and become complicated to measure.

94. A third type of effect stems from these unmeasured ripples of inefficiency. For example, as farms decide that prices are too high in this market, they may decide to incur costs in order to work with a more distant elevator. These costs may be pecuniary (e.g., the cost of commercial trucking), but they may also include intangible costs related to the disadvantages of dealing with an unfamiliar elevator. Both types of costs are arguably included in deadweight loss, since they partially explain farms' willingness to pay for grain handling services from more proximate elevators. However, as these out-of-market elevators see increased demand for their services, they may raise prices and

create a new round of deadweight loss that I have not modeled or measured, making my estimates likely conservative. In the longer run, the increase in market power and concomitant higher prices of grain handling services within the market might induce some farmers to plant less canola or wheat, to invest less in the yield of their crop, or possibly even to use their land for something other than growing wheat or canola altogether—options that depend on many factors beyond the prices we can measure here.

95. Measurement complications aside, deadweight loss is a way to illuminate a simple principle: the Canadian economy is harmed because prices for grain handling services reflect less well the true cost of providing those services. Instead, they reflect the increased market power the Moosomin and Virden elevators acquired through the Transaction. The larger this gap, or wedge, between the true cost and price becomes, the less efficient the economy becomes, and the greater the deadweight loss from forgone transactions within the market becomes. The reason is that participants in the economy—in this case, farms—make decisions according to the prices they face, but the most efficient decisions would be based upon the true cost.

96. Having discussed these consequences in the abstract, I next document that the Moosomin and Virden elevators do in fact sell substitutable products, and then quantify the resulting price changes and welfare consequences of the Transaction.

5.2. Documents show that prices at the Moosomin and Virden elevators are affected by competition between them

97. [redacted]

98. [redacted]

[redacted][133]

99. [redacted][134][redacted][135][redacted][36]

100. Third, farmers have registered their concern that the Transaction would remove competition between the two elevators,[137] and some farmers testified that they have already noticed differences in pricing behavior.[138] Moreover,

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[133] [redacted]

[134] [redacted]

[135] [redacted]

[136] [redacted]

[137] Witness Statement of [redacted], August 11, 2020, pp. 1-7 at pp. 3-4 ("I will sometimes call P&H's elevator at Moosomin but my experience has been that the Moosomin elevator has not offered competitive prices. Since P&H acquired the Virden elevator from Louis Dreyfus, I have been told to take samples of my grain to P&H's elevator in Moosomin. Given my experience with P&H's prices, I am concerned about the loss of competition caused by P&H owning both the Virden and Moosomin Elevator.").

[138] Witness Statement of [redacted], August 7, 2020, pp. 1-7 at p. 4 ("After P&H acquired Virden, I have noticed that the price for lower protein wheat has been lower. When Louis Dreyfus owned Virden the discount for lower protein wheat was $0.01 - $0.02 cents. P&H at Virden now applies a $0.05 cent discount. I grow approximately 70,000 bushels of wheat. The difference in the discount between Louis Dreyfus and P&H means I have foregone approximately $14,000 to $21,000 (plus extra trucking costs of having to go further) in revenue."); Witness Statement of [redacted], August 25, 2020, pp. 1-7 at p. 4 ("Prior to the acquisition, I observed price differences of between $0.40 to $0.50 cent per bushel between what I can get for my crops from P&H at Moosomin and Louis Dreyfus at Virden.").

testimony confirms that farms actively consider both elevators, weighing their prices against each other.[139]

101. I interpret [redacted] and customer concerns as establishing that the Moosomin and Virden elevators compete in ways that can be important. I next turn to evaluating the extent of that competition; the following sections quantitatively estimate the economic consequences of allowing P&H to control both elevators.

5.3. [redacted]famers view the Moosomin and Virden elevators as substitutes

102. As the *Guidelines* note, "The closeness of competition between the merging firms' products may be measured by the diversion ratio between them."[140] In this section, I calculate and discuss the diversion ratio between the Moosomin and Virden elevators. Before I do so, however, I define the diversion ratio and give an example to ease interpretation.

103. Consider the diversion ratio from one elevator (A) to another elevator (B). If A were to raise the price it charges for grain handling services, some of its customers would decide to purchase grain handling services from other elevators. Some of those farmers leaving A would choose elevator B, while some would choose other elevators. The diversion ratio is the *fraction* of farmers leaving A who would choose elevator B.

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[139] Witness Statement of [redacted], August 7, 2020, pp. 1-7 at pp. 2-3 ("In the past two years I have sold most of my canola and wheat to P&H's Moosomin elevator and Louis Dreyfus' Virden elevator. The majority of the crop went to LDC and only small amount to P&H, as they were not as competitive on price. I have also sold to G3 at Portage and Richardson at Kemnay."); Witness Statement of [redacted], August 25, 2020, pp. 1-7 at pp. 2-3 ("When selling wheat and grain, I regularly check the prices at the P&H elevator in Moosomin, SK, the Viterra elevator in Fairlight, SK, the elevator formerly owned by Louis Dreyfus in Virden, the Richardson Pioneer elevator in Kemnay, MB and the G3 elevator in Bloom, MB."); Witness Statement of [redacted], August 19, 2020, pp. 1-9 at p. 3 ("Over the past three years, I have exclusively sold grain to the Louis Dreyfus elevator in Virden, MB, the P&H elevator in Moosomin, SK, and the Viterra elevator in Fairlight, SK. Generally, I sell more grain to Louis Dreyfus' Virden elevator because it is located only 15km from my farm and the price for grain has historically been better for me. Prior to the acquisition, I sold approximately 90% of my grain to LDC Virden.").

[140] Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 6.15. Footnote 35 to the Guidelines defines the diversion ratio as follows: "The diversion ratio between firm A's product and firm B's product is equal to the fraction of sales lost by firm to firm B when firm A raises the price of its product. Similarly, the diversion ratio between firm B's product and firm A's product is equal to the fraction of sales lost by firm B to firm A when firm B raises the price of its product. The diversion ratios between firms A and B need not be symmetric."

104. To make this definition more concrete, suppose that A sells grain handling services for 100 MT of canola, while B sells grain handling services for 50 MT of canola. Now suppose that A raises the price of grain handling services by $0.10/MT, while B does not change its price. After the price change, A loses 20 MT of business—it only sells grain handling services for 80 MT of canola. B picks up some of those customers, now selling grain handling services for 60 MT of canola. The other 10 MT are distributed across a variety of other elevators. In this case, the diversion ratio from A to B is $DR_{A \to B} = \frac{60-50}{100-80} = 50\%$.

105. Intuitively, this measure can be useful in evaluating the degree to which elevators A and B compete because it captures how willing customers are to *substitute* between them, relative to other options. Economic theory indicates that, in general, products, services, or supply points that customers view as close substitutes will more strongly constrain each other's prices than will more distant substitutes. This is because, if one of the close substitutes tried to raise prices by even a small amount, many customers would immediately switch to the other, making such a price increase unprofitable. Therefore, a merger of close substitutes will generally lead to more harm to customers—in this case, farms. Indeed, the *Guidelines* state:

> [A] merger may create, enhance or maintain the ability of the merged firm to exercise market power unilaterally when the product offerings of the merging parties are close substitutes for one another... [T]he incentives to raise prices after the merger are greater the more closely the products of the merging firms compete with each other.[141]

106. Returning, then, to diversion ratios, high diversion ratios between the Moosomin and Virden elevators indicate that many farms view the Moosomin and Virden elevators as substitutes, which suggests that the Transaction may be particularly harmful.

107. In this subsection, I discuss how farms' choices in the transaction data can be used to estimate diversion ratios and other aspects of farms' preferences (Section 5.3.1). Using the estimates from this model, I show that the diversion ratios between Moosomin and Virden indicate that many farms view these elevators as the next-closest substitute (Section 5.3.2). Specifically, I find that the diversion ratio from Moosomin to Virden is [redacted] for canola and [redacted] for wheat; similarly, the diversion ratio from Virden to Moosomin is [redacted] for

[141] Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶¶ 6.13–6.14

canola and [redacted] for wheat. All of these ratios are high enough to raise competitive concerns about the Transaction.

5.3.1. A farm choice model can be used to estimate diversion ratios.

108. I model farms' decisions to purchase grain handling services from one of several primary elevators—or, in the case of canola, to decline to purchase grain handling services and instead sell to a crusher—using a discrete choice framework.[142] When farms decide to use a primary elevator, they choose between a discrete set of nearby elevators, factoring in the elevators' differing grain prices and transportation costs,[143] among other considerations.[144]

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[142] This widely adopted method of analyzing consumer (i.e., farm) choice was pioneered by Professor Daniel McFadden, who in 2000 received the Nobel Prize in Economics for developing these methods. See The Nobel Prize Press Release "The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2000," October 11, 2000, available at https://www.nobelprize.org/prizes/economic-sciences/2000/press-release/, accessed on September 4, 2019 ("Citation of the Academy: 'to James Heckman for his development of theory and methods for analyzing selective samples and to Daniel McFadden for his development of theory and methods for analyzing discrete choice.'"); McFadden, Daniel , "Conditional Logit Analysis of Qualitative Choice Behavior," *Frontiers in Econometrics*, ed. Paul Zarembka (New York: Academic Press, 1974), pp. 105–142 at p. 106 ("This paper outlines a general procedure for formulating econometric models of population choice behavior from distributions of individual decision rules. [...] The relevance of these methods to economic analysis can be indicated by a list of the consumer choice problems to which conditional logit analysis has been applied: choice of college attended, choice of occupation, labor force participation, choice of geographical location and migration, choice of number of children, housing choice, choice of number and brand of automobiles owned, choice of shopping travel mode and destination.").

[143] As noted in Section 2.2, farms may either own trucks to haul their grain or hire commercial trucks to transport grain from the farm to the primary elevator, and both are costly to farms. These trucks typically charge farmers by the distance and tonne transported. See Witness Statement of [redacted], August 7, 2020, pp. 1-7 at p. 3 ("The rates are to Portage $22/MT, to Kemnay $12.10/MT and Oakner $11.50/MT."); Witness Statement of Harvey Brooks, August 27, 2020, pp. 1-12 at p. 9 ("However, not all producers are able to transport all of their wheat and many now use commercial truckers. Commercial truckers likely will be more expensive in terms of cash costs and can be difficult to source during peak seasons, particularly during harvest."); Witness Statement of [redacted], August 7, 2020, pp. 1-7 at p. 3 ("I have a straight trailer that can only haul 26 tonnes at a time so it is not a good use of my time to haul my crop to more distant elevators. [...] Due to the time and cost of hauling crop, I need an additional $0.25 - $0.30 cents a bushel to haul my crop an extra hour.")[redacted]
Transportation costs also embody other factors such as the time required to transport the grain or the number of trips if a farms owns and operates its own truck. See Witness Statement of [redacted], August 19, 2020, pp. 1-9 at pp. 3, 5 ("Viterra Fairlight is located approximately 41km from my farm, however between March and June there are weight restrictions on Road 60 making transportation more expensive. To keep under the weight restrictions, I would have to haul half of a load. [...] In addition, the further I go increase the risk of being pulled over by the DOT and have my truck searched. These types of searches will cost me time and possibly money if there's anything to report."); Witness Statement of Harvey Brooks, August 27, 2020, pp. 1-12 at p. 9 ("In their effort to maximize profits, the other important factor that a producer considers is transportation costs. All else equal, a producer would prefer to sell to the closest elevator to minimize transportation costs. A producer also prefers to sell to an elevator that is close enough to allow them to deliver multiple loads per day.").

[144] The specific estimated choice model controls directly for the travel time between farms and all elevators located in the defined relevant service area, as well as farm fixed effects. The fixed effects control for factors affecting farms' elevator choices, but that are not observed and cannot be included directly in the model. See Angrist, Joshua D., and Jörn-Steffen Pischke, *Mostly Harmless Econometrics: An Empiricist's Companion*, (Princeton, NJ: Princeton University Press, 2009), p. 221 ("The key to causal inference [...] is control for observed confounding factors" including "strategies that use data with a time or cohort dimension to control for unobserved but fixed omitted variables," which is in reference to fixed effects estimators.). See also Appendix Section 6.1.3 for a description of the defined services areas and Appendix Section 6.2 for the model farm demand model estimates.

109. My model takes into account two of the factors that farms consider most strongly: the price of grain handling services, and distance.[145] Numerous farmers' witness statements highlight the importance of these two factors, with several farmers explicitly describing the direct tradeoff between price and distance.[146] The model also accounts for other unexplained desirability or quality of the services provided by the elevators.

110. I use detailed grain transaction data supplied by the elevators to estimate a relationship between farms' primary elevator choices and factors that drive those decisions. I then use the estimated model to predict the likelihood that farms choose each of the elevators, conditional on farm and elevator characteristics.

111. To begin, I estimate a model capturing farms' elevator choices using a conditional logit demand system. The conditional logit framework assumes that each farm *considers* the available, primary elevators and *chooses* the elevator offering the farm the most value. In the data, I observe (a) actual farms' elevator choices, (b) characteristics leading to that choice such as grain transaction prices and drive time to elevators, and (c) the frequency with which farms choose a particular elevator. The model estimated using this data generalizes farm preferences for elevator characteristics. For example, the model captures that farms value elevator proximity by including drive time between each farm and elevator choice in the model.[147,148] The farms' elevator

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[145] Technically speaking, price is implicitly incorporated into the model via elevator fixed effects.

[146] Witness Statement of [redacted], September 3, 2020, pp. 1-13 at p. 4 ("The closer elevators cost less to haul to so an elevator further away needs a higher bid to cover the freight costs. We also consider the road conditions to get to the elevator."); Witness Statement of [redacted], August 7, 2020, pp. 1-7 at p. 3 ("Due to the time and cost of hauling crop, I need an additional $0.25 - $0.30 cents a bushel to haul my crop an extra hour."); Witness Statement of [redacted] August 11, 2020, pp. 1-7 at p. 4 ("Given the time and cost associated with hauling my grain, more distant elevators would have to offer a higher price for me to consider selling to them."); Witness Statement of [redacted], August 26, 2020, pp. 1-7 at p. 3 ("I choose where I will sell my crop based on a combination of the price an elevator offers for my crop and the distance to the elevator.").

[147] Refer to Appendix Section 6.2 for a full description of the demand specification and sensitivities. I use the data on elevators' and farms' locations, along with ArcGIS, to construct farms' driving times to each of the elevators in the model, including the one chosen. See Appendix Section 6.1 for more details about the constructed data.

[148] The conditional logit model also includes an error term that captures aspects of farms' preferences that are different across farms in ways that are unrelated to characteristics of farms or elevators that are visible in the data. Train, Kenneth, *Discrete Choice Methods with Simulation*, (Cambridge University Press, 2002), pp. 20, 43 ("They are derived under the assumption that the unobserved portion of utility is distributed iid extreme value and a type of generalized extreme value, respectively. [...] Under independence, the error for one alternative provides no information to the researcher about the error for another alternative. Stated equivalently, the researcher has specified [value of each alternative] sufficiently that the remaining, unobserved portion of utility is essentially 'white noise.'"); Train, Kenneth, *Discrete Choice Methods with Simulation*, (Cambridge University Press, 2002), p. 21 ("The probability that the person chooses bus instead of car is the probability that the unobserved factors for bus are sufficiently better than those for car to overcome the advantage that car has on observed factors.").

choice model is estimated separately for purchases of grain handling services for wheat and canola.[149]

112. My model allows me to study how farms that purchase grain handling services from Moosomin and Virden would respond to a price increase at any of these elevators—i.e., whether they would respond by switching to the Moosomin or Virden elevators or switching to other elevators or crushers. Specifically, these farms could switch to:

- (Elevators) Antler, Binscarth, Brandon, Brandon_HT, Carnduff, Elva, Fairlight, Minnedosa, Moosomin, Oakner, and Souris, Virden, and Whitewood
- (Canola crushers) Altona, Harrowby, Yorkton (operated by Richardson), Yorkton (operated by LDC), and Velva. As mentioned earlier, it is not always viable for farms to ship to crushers, but the data do not reveal how often this constrains their choices. I have estimated the two extreme possibilities – that no farms have this option and that all farms have the option. As the predictions are not sensitive between these extremes, I conservatively assume that all canola farms can *at any time* ship to canola crushers.

113. Note that many of these elevators are located in the periphery of, or outside, the service areas discussed in Section 2.2. Furthermore, many are outside the relevant geographic market discussed in Section 3. Including these elevators as choices in the model captures a more realistic collection of choices available to farms, though I will hold these elevators' pricing decisions fixed in my simulations, as they lie outside the relevant market. Appendix Sections 6.1 and 6.2 outline the technical details of my estimation process, including sample restrictions and data processing procedures, and present the parameter estimates.[150]

[149] Farms' preferences for grain handling services are likely different for different types of grain, as Exhibit 10 shows that Moosomin and Virden have different market shares for the two grains. Estimating the two models separately flexibly captures any potential difference between the two markets.

[150] See Appendix Section 6.1 for a detailed description of how the data was constructed and why some farm observations are excluded from the modeling exercise.

5.3.2. Diversion ratios indicate that many farms view the Moosomin and Virden elevators as close substitutes

114. I use the model discussed in the last section to predict how farms would respond to a price increase at one elevator, which in turn implies the diversion ratios between the Moosomin and Virden elevators. I present the calculated diversion ratios in Exhibit 11. For wheat, the diversions from Moosomin to Virden and from Virden to Moosomin are [redacted] and [redacted], respectively. Diversion ratios for wheat between the Moosomin and Virden elevators indicate that they are relatively close competitors. For canola, diversion between Moosomin and Virden is smaller. However, Fairlight has large diversion ratios with both elevators, suggesting there is likely indirect competition between the two, through Fairlight, for both grains.

115. I also present the diversion ratios in Exhibit 11 for a choice model that does not allow canola farms to ship to crushers. As mentioned in Section 3.1, it is not always viable for farms to ship to crushers, and, as such, including crushers in the farms' choice set likely overstates the sales that are diverted to crushers, which in turn conservatively understates the diversion between the Moosomin and Virden elevators. On the other hand, removing this option likely *overstates* diversion between the Moosomin and Virden elevators; the true diversion ratio likely falls between these sensitivities.

EXHIBIT 11
Diversion ratios

Grain	Diversion from Moosomin to Virden	Diversion from Virden to Moosomin	Diversion from Moosomin to Fairlight	Diversion from Virden to Fairlight
Wheat	[redacted]			
Canola Including Crushers				
Canola Excluding Crushers				

Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: The analysis for wheat runs from August 2018 through July 2019, and the analysis for canola runs from March 2018 through February 2019. Analysis limited to transactions in the 90% service area. Nexera and non-GMO canola are excluded. Only CWRS wheat is included. The 90% service area represents the union of the CCSs in the 90% service areas of Moosomin, Virden, or Fairlight. The 90% service area of each individual elevator represents the closest CCSs to the individual elevator that collectively form 90% of the total net quantity bought by the individual elevator. Diversion ratios are weighted by net quantity sold per farm per crop year to the chosen elevator. Diversion ratios are based on a choice model that controls for drive times to each elevator choice and is weighted by net quantity sold per grower per crop year to the chosen elevator. The canola crushers in the data are ADM's Velva, Bunge's Altona and Harrowby, LDC's Yorkton, and Richardson's Yorkton canola crushers.

5.4. Upward pricing pressure shows strong incentives to raise price.

116. Upward pricing pressure ("UPP") is a tool discussed in the academic literature that is often used in merger review to approximate the incentive for the merging parties to unilaterally raise price.[151] In this section, I compute several measures of upward pricing pressure which all show that prices would likely rise as a result of the Transaction.

5.4.1. Upward pricing pressure approximates the incentive for one of the merged parties to raise its price

117. UPP and its closely related statistic, the gross upward pricing pressure index ("GUPPI"), capture and quantify the intuition behind the most basic theory of harm associated with horizontal mergers—the incentive for the merging parties to raise their prices.

118. Section 5.1 above discusses the intuition for why mergers can result in competitive harm—the incentives that lead merging firms to raise their prices. One can consider these incentives in reverse. Consider a firm that is considering lowering its price to compete for customers. Before the merger, the cost of serving an additional customer is just the marginal cost of producing the good or service. After the merger, however, there is an additional *opportunity* cost of serving this customer: the chance that customer might have been served by the other merging party anyway. The upward pricing pressure ("UPP")

[151] Farrell, Joseph, and Carl Shapiro, "Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition," *The BE Journal of Theoretical Economics* 10(1), 2010, pp. 1–39 at p. 2 ("This approach, based directly on the underlying economics of pricing, asks whether the merger will generate net upward pricing pressure (UPP). This involves comparing two opposing forces: the loss of direct competition between the merging parties, which creates upward pricing pressure, and marginal-cost savings from the merger, which create (offsetting) downward pricing pressure."); Miller, Nathan H., and Marc Remer et al., "Upward pricing pressure as a predictor of merger price effects." *International Journal of Industrial Organization*, 52, 2017, pp. 216–247. While Canada has used upward pricing pressure as a "screening" tool, UPP has an extensive role in U.S. antitrust, which includes citations by courts, e.g. *Cigna/Anthem*. See Government of Canada, "Competition Bureau statement regarding Evonik's proposed merger with PeroxyChem," January 28, 2020, available at https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04519.html, ("The Bureau's analysis of likely competitive effects was also informed by upward pricing pressure and merger simulation analyses conducted by its economic expert.") (accessed on September 2, 2020); Memorandum Opinion, *United States of America, et al., v. Anthem, Inc., et al.*, United States District Court for the District Of Columbia, Case No. 1:16-cv-01493-ABJ, February 21, 2017, pp. 1-140 at pp. 58-59 ("Using an Upward Pricing Pressure (UPP) analysis, Dr. Dranove predicted static harm totaling $383.8 million. And when he performed the UPP analysis again, this time incorporating the fact that win/loss data suggests that Anthem and Cigna are close competitors, the exercise led to a total of $930.3 million in static harm in the relevant market.").

approximates this additional opportunity cost, and the gross upward pricing pressure index ("GUPPI") frames that opportunity cost as a percentage of price.

119. Both UPP and GUPPI consider two import factors that influence a merging party's pricing decisions:

- the diversion ratio from itself to its merging partner; and
- the markup of its merging partner.

120. As discussed above in Section 5.3, the diversion ratio measures the share of sales that are lost by one party due to a price increase that would be recaptured by the merging partner due to a price change. The incentive to raise prices is higher when more customers will be recaptured—when the diversion ratio is higher. Alternatively, the opportunity cost of attracting customers with lower prices is higher when many of them will be taken from the other merging party. Thus, the UPP at one party is proportional to the diversion ratio from that party to the other.

121. The markup of the other merging party measures the marginal profit, or value, of recapturing an additional customer. The incentive to raise prices is higher when this value is higher. Alternatively, the opportunity cost of attracting customers with lower prices is higher when the ones coming from the other merging party were generating very high profits. Thus, the UPP at one party is proportional to the markup at the other party.

122. Formally, the UPP at elevator i is defined as follows:

$$UPP_i = Diversion\ ratio_{i \to j} \times Markup_j$$

123. One key difference between UPP and GUPPI is that GUPPI reports the upward pricing pressure as a percentage of the starting price and is defined as follows:

$$GUPPI_i = \frac{UPP_i}{P_i}.$$

5.4.2. UPP and GUPPI measures show that prices would likely rise as a result of the Transaction

124. One of the inputs to UPP and GUPPI measures is the diversion ratio, which has been calculated and discussed in Section 5.3 above. The other input is markup. In Appendix Section 6.4.1, I discuss the details of how I calculated the markup at Virden; I then calibrated the markup at Moosomin based on the markup at Virden using my merger simulation model as discussed below in Section 5.5.3. In Exhibit 12, I present the UPP and GUPPI results. The UPPs for wheat are both [redacted], while the UPPs for Moosomin for canola are [redacted]. I find that GUPPI measures around [redacted] for wheat, and also around [redacted] for canola at Moosomin. Thus, both UPP and GUPPI show prices would be likely to increase after the Transaction.

EXHIBIT 12
UPP and GUPPI

Grain	Moosomin UPP	Moosomin GUPPI	Virden UPP	Virden GUPPI
Wheat	[redacted]			
Canola Including Crushers				
Canola Excluding Crushers				

Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; 2018 and 2019 LDC P&L Statements; 2018 & 2019 LDC Throughput Data; Grain Elevators in Canada Data; Canada/U.S. Exchange Rate (DEXCAUS) Data; Bank of Canada Annual Average Canada/U.S. Exchange Rate Data; iVolatility Minneapolis Spring Wheat Futures Data; Capital IQ ICE Canola Futures Data; 2016 Census Program CCS Boundary Files

Note: The analysis for wheat runs from August 2018 through July 2019, and the analysis for canola runs from March 2018 through February 2019. Analysis limited to transactions in the 90% service area. Nexera and non-GMO canola are excluded. Only CWRS wheat is included. The 90% service area represents the union of the CCSs in the 90% service areas of Moosomin, Virden, or Fairlight. The 90% service area of each individual elevator represents the closest CCSs to the individual elevator that collectively form 90% of the total net quantity bought by the individual elevator. The canola crushers in the data are ADM's Velva, Bunge's Altona and Harrowby, LDC's Yorkton, and Richardson's Yorkton canola crushers. UPP and GUPPI values are based on diversion ratios (see Exhibit 11) and markups. Moosomin UPP is calculated using Virden's markup which is calculated from LDC P&L statements (See Appendix Section 6.4.1). Virden's UPP is calculated using Moosomin's markup which is implied by Virden markup and baseline merger simulation model calibration (See Section 5.5.3).

125. In summary, I find standard upward pricing pressure metrics show an incentive to raise prices as a result of the Transaction.

5.5. Merger simulation results show that prices would likely rise and welfare would likely fall as a result of the Transaction

126. While the upward pricing pressure analysis yields fairly accurate approximations of price effects, it cannot produce estimates of welfare changes. In this section, I develop and calibrate a merger simulation model, which I then simulate to estimate the effect of the Transaction. Because the model explicitly characterizes farms' preferences and elevators' profits, the simulation can be used to predict the welfare effects of the Transaction and, in turn, the change in deadweight loss.

127. Merger simulation models are a widely accepted method for assessing the competitive effects of a merger. They are commonly discussed and accepted in the economic and antitrust academic literatures,[152] and the literature has continuously improved and refined these tools;[153] the analysis I present in this section reflects the principles established by this literature. Furthermore, while the *Guidelines* do not specifically mention merger simulation, the Competition Bureau does mention it as an important approach in reviewing mergers;[154] the technique has gained wide acceptance at the Competition Bureau and in other

[152] Baker, Jonathan B., and David Reitman. "Research Topics in Unilateral Effects Analysis," *Research Handbook on the Economics of Antitrust Law*, Washington College of Law Research Paper 2009-37, November 9, 2009; Werden, Gregory J., and Luke M. Froeb, "Unilateral Competitive Effects of Horizontal Mergers," *Advances in the Economics of Competition Law*, October 3, 2005; Shapiro, Carl. "The 2010 horizontal merger guidelines: From hedgehog to fox in forty years." *Antitrust Law Journal*, 77(1), 2010; Davis, Peter, and Eliana Garcés. *Quantitative Techniques for Competition and Antitrust Analysis*, (New Jersey: Princeton University Press, 2009, pp. 382-383.

[153] Miller, Nathan H., and Matthew C. Weinberg, "Understanding the rice effects of the MillerCoors joint venture," *Econometrica*, 85(6), 2017, pp. 1763–1791; Ciliberto, Federico, and Jonathan W. Williams, "Does multimarket contact facilitate tacit collusion? Inference on conduct parameters in the airline industry," *The RAND Journal of Economics*, 45(4), 2012, pp. 764-791.

[154] Government of Canada, "Competition Bureau statement regarding Evonik's proposed merger with PeroxyChem," January 28, 2020, available at https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04519.html ("The Bureau's analysis of likely competitive effects was also informed by upward pricing pressure and merger simulation analyses conducted by its economic expert.") (accessed on September 2, 2020); Government of Canada, "Competition Bureau statement regarding La Coop fédérée's proposed acquisition of Cargill Limited's grain and retail crop inputs businesses in Ontario," November 18, 2018, available at https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04403.html ("Both pricing pressure and merger simulation analyses were employed to quantify the likely harms to growers resulting from the loss of price competition between the parties and the loss of choice resulting from anticipated site closures") (accessed on September 2, 2020).

jurisdictions;[155] and simulations (or their absence) have played an important role in past court decisions.[156]

5.5.1. The simulation model—overview

128. A merger simulation uses an economic model specifying the way that firms interact with one another and the way that consumers make choices to simulate the effects of a merger on the firms' choices such as the price to set for their products. The model is fit, or calibrated, to the observed facts of the market before the merger, and then simulated for a set of facts where the ownership of particular products changes and the new owner is assumed to maximize joint profits across the merging products. The typical merger simulation, therefore, involves a series of steps:

- Specification: Laying out general assumptions about the nature of participants' preferences, how they make choices given conditions they might face, and how the market reaches an equilibrium.
- Calibration: Infer the parameters of participants' preferences from the choices that they made before the merger, which I observe in data.
- Simulation: This occurs in two stages

[155] Government of Canada, "Competition Bureau statement regarding Evonik's proposed merger with PeroxyChem," January 28, 2020, available at https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04519.html, accessed on August 31, 2020; Government of Canada, "Competition Bureau statement regarding La Coop fédérée's proposed acquisition of Cargill Limited's grain and retail crop inputs businesses in Ontario," available at https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04403.html (accessed on August 31, 2020); Government of Canada, "Competition Bureau statement regarding Superior Plus LP's proposed acquisition of Canwest Propane from Gibson Energy ULC," February 2, 2018, available at https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04307.html (accessed on August 31, 2020); U.S. Department of Justice and the Federal Trade Commission, "Horizontal Merger Guidelines," August 19, 2010, pp. 1-34 at p. 21; *The Commissioner of Competition v. Superior Propane Inc.*, Competition Tribunal, 15, August, 30, 2000.

[156] In fact, the Supreme Court of Canada ruled in *Tervita* that, "The Commissioner's burden is to quantify by estimation all quantifiable anti-competitive effects. Estimates are acceptable as the analysis is forward-looking and looks to anti-competitive effects that will or are likely to result from the merger. The Tribunal accepts estimates because calculations of anti-competitive effects for the purposes of s. 96 do not have the precision of history. However, to meet her burden, the Commissioner must ground the estimates in evidence that can be challenged and weighed [...] Due to the uncertainty inherent in economic prediction, the analysis must be as analytically rigorous as possible in order to enable the Tribunal to rely on a forward-looking approach to make a finding on a balance of probabilities." *Tervita Corporation, Complete Environmental Inc., and Babkirk Land Services Inc. v. Commissioner of Competition*, March 27, 2014, pp. 161-244 at p. 213. Since then, UPP and merger simulations have become quite common. See Michael Ward Affidavit, *The Commissioner of Competition v. Superior Propane Inc.*, September 13, 1999, pp. 1-37 at pp. 5-7; *The Commissioner of Competition v. Superior Propane Inc.*, Competition Tribunal, 15, August, 30, 2000.

- » Adjust the merging parties' pricing incentives to account for the fact that they are now a merged entity that fully internalizes each other's profits
- » Using these new pricing incentives, solve for the new prices and quantities chosen by all market participants after the merger. Report relevant outcomes, such as prices, quantities, and welfare.

5.5.2. The simulation model—specification

129. The simulation model takes a crop year as a whole, with all variables representing quantities over an entire crop year and prices constant for an entire year. As a sensitivity, in the Appendix, I consider a version of the model in which prices and costs can vary from month to month.[157]

130. Farms and elevators interact in this market. Farms' preferences and choices, or demand for grain handling services, has already been discussed in Section 5.3 above, and I employ that model here. While that model did include options outside the market, it did not include every option. Specifically, it did not include the option to plant less canola or wheat as a dynamic response to increased prices for grain handling and, therefore, less profitability from planting canola or wheat as a crop. In that sense, the simulation will be conservative for estimating the increase in deadweight loss; the fact that farms chose to plant canola or wheat before the Transaction indicates that, but for the anticipated price increase due to the Transaction, canola or wheat is the most valuable use of their land.

131. For the three elevators inside the relevant market, the simulation straightforwardly assumes that each elevator has a constant marginal cost of grain handling services, at least over the relevant range of grain tonnage that the elevator might handle in any simulated outcome. Then, each elevator sets a price to maximize its own profits pre-Transaction. Post-Transaction, the combined firm will set prices for Moosomin and Virden to maximize the merged entity's combined profits.

[157] See Appendix Section 6.5.4 for a more detailed specification of this monthly sensitivity. I present results here without further discussion.

132. As is standard, I do not specify the pricing incentives of entities outside the relevant market—all elevators other than the Fairlight, Moosomin, and Virden elevators—and instead assume that they passively maintain constant prices. Furthermore, I lack data on many of the elevators with which these peripheral elevators likely compete—in particular, those even further away from Moosomin, Virden, and Fairlight. Therefore, any attempt to model their profits or pricing incentives would likely be biased and lead to less reliable model predictions.

133. Competition among the elevator owners is represented by an equilibrium of the Bertrand pricing model.[158] That is, equilibrium consists of a collection of prices such that each company maximizes profits, taking as given the prices chosen by all other companies. In equilibrium, no company can unilaterally improve its profit.

[158] Organisation for Economic Co-operation and Development, "Glossary of Statistical Terms," updated on February 28, 2003, available at https://stats.oecd.org/glossary/detail.asp?ID=3151, ("In a Bertrand model of oligopoly, firms independently choose prices (not quantities) in order to maximize profits. This is accomplished by assuming that rivals' prices are taken as given. The resulting equilibrium is a Nash equilibrium in prices, referred to as a Bertrand (Nash) equilibrium.") (accessed on September 2, 2020).

5.5.3. The simulation model—calibration

134. Before simulating the model, I used this same assumption about profit-maximizing elevator behavior to calibrate the model and, in particular, to infer a price coefficient for farmer demand—a measure of how sensitive farmers are to the price of grain handling services. Technically, I calibrated the simulation as follows:

- Marginal cost of the Virden elevator is determined directly from LDC's profit and loss data, discussed in Appendix Section 6.4.1.
- The price coefficient of demand—i.e., how sensitive farms are to the price of grain handling services when choosing from which elevator to purchase those services—is determined by assuming that Virden's price maximizes Virden's profits.
- Marginal costs of the Moosomin and Fairlight elevators are determined by assuming that Fairlight's and Moosomin's prices maximize profits at these two elevators, respectively, taking as given the demand parameters already established.[159]

135. Exhibit 13 displays the results of this calibration procedure. I have included own-price elasticities of demand for each of the three elevators as well; the own-price elasticity of demand quantifies the percentage drop in quantity of grain handling services sold that would result if the elevator raised its price by [redacted]. The results are reasonable, with margins around [redacted] and own price elasticities of demand around [redacted].

136. Total welfare in the model is given by the sum of the value that each farm receives from the market for grain handling services, together with the profits of elevators within the relevant market. Change in deadweight loss is then the opposite of the change in total welfare.

[159] See Appendix Section 6.5.2 for a fuller technical discussion of this process.

EXHIBIT 13
Calibration results

		Wheat	Canola Including Crushers	Canola Excluding Crushers
Virden	Price	[redacted]		
	Marginal Cost			
	Markup			
	Margin			
	Elasticity			
Moosomin	Price	[redacted]		
	Marginal Cost			
	Markup			
	Margin			
	Elasticity			
Fairlight	Markup	[redacted]		
Cost of Drive Time (CAD/min/MT)		[redacted]		

Source: LDC Transaction Data; P&H Transaction Data; ADM Transaction Data; Bunge Transaction Data; Cargill Transaction Data; G3 Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files; Canada/U.S. Exchange Rate (DEXCAUS) Data; Bank of Canada Annual Average Canada/U.S. Exchange Rate Data; iVolatility Minneapolis Spring Wheat Futures Data; Capital IQ ICE Canola Futures Data; 2018 & 2019 LDC P&L Statements; 2018 & 2019 LDC Throughput Data

Note: The analysis for wheat runs from August 2018 through July 2019, and the analysis for canola runs from March 2018 through February 2019. Analysis limited to transactions in the 90% service area and within 600 km of Moosomin or Virden. Nexera and non-GMO canola are excluded. Only CWRS wheat is included. The 90% service areas represent the union of the CCSs in the 90% service areas of Moosomin, Virden, or Fairlight. The 90% service area of each individual elevator represents the closest CCSs to the individual elevator that collectively form 90% of the total net quantity bought by the individual elevator. The canola crushers in the data are ADM's Velva, Bunge's Altona and Harrowby, LDC's Yorkton, and Richardson's Yorkton canola crushers. Specification and calibration of the merger simulation model are described in Section 5.5 and are based on the farm choice model (Section 5.3.1). Fairlight's prices and marginal costs are not determined in levels due to lack of net price data, so only markups are presented.

5.5.4. The simulation model—simulation

137. Using the model to simulate the results of the Transaction is straightforward: As discussed above, I note the merged elevators' altered incentives—i.e., the fact that Virden takes into account profits at Moosomin when setting its price, and vice-versa—and then solve for the new Bertrand equilibrium. Exhibit 14 summarizes the outcome. For both grains, we see increases in price for the merging elevators, with a smaller increase in price for the Fairlight elevator. This leads to a drop in share for the merging elevators and a smaller rise in share for the Fairlight elevator.

EXHIBIT 14
Simulation results

	Elevator	Price Before Acquisition	Price After Acquisition	Change in Price
Wheat	Moosomin	[redacted]		
	Virden			
	Fairlight			
Canola Including Crushers	Moosomin	[redacted]		
	Virden			
	Fairlight			
Canola Excluding Crushers	Moosomin	[redacted]		
	Virden			
	Fairlight			

	Elevator	Share Before Acquisition	Share After Acquisition	Change in Share
Wheat	Moosomin	[redacted]		
	Virden			
	Fairlight			
Canola Including Crushers	Moosomin	[redacted]		
	Virden			
	Fairlight			
Canola Excluding Crushers	Moosomin	[redacted]		
	Virden			
	Fairlight			

Source: LDC Transaction Data; P&H Transaction Data; ADM Transaction Data; Bunge Transaction Data; Cargill Transaction Data; G3 Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files; Canada/U.S. Exchange Rate (DEXCAUS) Data; Bank of Canada Annual Average Canada/U.S. Exchange Rate Data; iVolatility Minneapolis Spring Wheat Futures Data; Capital IQ ICE Canola Futures Data; 2018 & 2019 LDC P&L Statements; 2018 & 2019 LDC Throughput Data

Note: The analysis for wheat runs from August 2018 through July 2019, and the analysis for canola runs from March 2018 through February 2019. Analysis limited to transactions in the 90% service area and within 600 km of Moosomin or Virden. Nexera and non-GMO canola are excluded. Only CWRS wheat is included. The 90% service areas represent the union of the CCSs in the 90% service areas of Moosomin, Virden, or Fairlight. The 90% service area of each individual elevator represents the closest CCSs to the individual elevator that collectively form 90% of the total net quantity bought by the individual elevator. The canola crushers in the data are ADM's Velva, Bunge's Altona and Harrowby, LDC's Yorkton, and Richardson's Yorkton canola crushers. Specification, calibration, and simulation of the merger simulation model are described in Section 5.5 and are based on the farm choice model (Section 5.3.1). Fairlight's prices are not determined in levels due to lack of net price data, so only changes in price are presented. Unlike in Exhibit 10, these shares include in the denominator all transactions with farms within the 90% service area. Furthermore, they are based on the model fitted probability that a farm chooses a given elevator, rather than observed elevator choices.

138. Exhibit 15 displays some statistics from the merger simulation about the welfare consequences of the Transaction. In the canola market, we see a drop in welfare for farmers of about [redacted] per year, with an increase in profit for elevators of about [redacted] per year, for a net increase in deadweight loss of [redacted]. In the wheat market, the stakes are much larger; we see a drop in welfare for farmers of around [redacted] per year, with an increase in profit for elevators of nearly [redacted] per year, for a net increase in deadweight loss of [redacted]

EXHIBIT 15
Welfare results

		Before Acquisition [A]	After Acquisition [B]	Change [B] - [A]
Wheat	Consumer Surplus	[redacted]		
	Total Profit			
	Total Surplus			
Canola Including Crushers	Consumer Surplus	[redacted]		
	Total Profit			
	Total Surplus			
Canola Excluding Crushers	Consumer Surplus	[redacted]		
	Total Profit			
	Total Surplus			

Source: LDC Transaction Data; P&H Transaction Data; ADM Transaction Data; Bunge Transaction Data; Cargill Transaction Data; G3 Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files; Canada/U.S. Exchange Rate (DEXCAUS) Data; Bank of Canada Annual Average Canada/U.S. Exchange Rate Data; iVolatility Minneapolis Spring Wheat Futures Data; Capital IQ ICE Canola Futures Data; 2018 & 2019 LDC P&L Statements; 2018 & 2019 LDC Throughput Data

Note: : The analysis for wheat runs from August 2018 through July 2019, and the analysis for canola runs from March 2018 through February 2019. All figures are in thousands of Canadian dollars. Analysis limited to transactions in the 90% service area and within 600 km of Moosomin or Virden. Nexera and non-GMO canola are excluded. Only CWRS wheat is included. The 90% service areas represent the union of the CCSs in the 90% service areas of Moosomin, Virden, or Fairlight. The 90% service area of each individual elevator represents the closest CCSs to the individual elevator that collectively form 90% of the total net quantity bought by the individual elevator. The canola crushers in the data are ADM's Velva, Bunge's Altona and Harrowby, LDC's Yorkton, and Richardson's Yorkton canola crushers. Specification, calibration, and simulation of the merger simulation model are described in Section 5.5 and are based on the farm choice model (Section 5.3.1). Consumer surplus and total surplus are not determined in levels, only in differences.

139. Most welfare loss results from customers choosing less preferred options outside the relevant market, which represents deadweight loss.

140. All of the foregoing analysis of welfare loss is based on a posted price market. As discussed in Section 2.4, while there is some evidence of price

discrimination, a posted-price model is the appropriate framework to study how prices are set in this industry. To the extent elevators negotiate an individual price for farms, a price-discrimination framework may be more descriptive of the market. In contrast to the posted-price model, economists use a price-discrimination model to capture situations where the prices charged to individual customers (or, in this case, individual farms) discriminate on the basis of characteristics that reflect differences in the individual's demand for the product–possibly even tailoring prices to specific farms.

141. Price-discrimination models suggest that the effect of lost competitive pressure is most likely borne by farms that had previously used their threat to switch to Moosomin (Virden) in their negotiations with Virden (Moosomin). Intuitively, farms in this category will have lost their "threat point," and will thus face a large price increase at Moosomin and Virden. On the other hand, farms located close to some other elevator retain their "threat point," and will face a smaller price increase.

142. The available data do not explicitly reflect whether an elevator negotiated with a specific farm, nor the many factors potentially considered in such negotiations.[160] Absent descriptions of farm characteristics that might affect specific negotiations, I can only approximate the overall, post-Transaction price changes instead of tailored price changes.[161] When approximating overall post-Transaction price changes using UPPs, the price-discrimination and posted-price models produce remarkably similar predictions.[162]

[160] [redacted]

[161] Refer to Appendix Section 6.5.3 for a technical description of the merger simulation and the specific methods used to predict the post-Transaction price changes for elevators located in the relevant market.

[162] See Workpaper 4.

5.6. Moosomin's planned rail track expansion in light of the Transaction

143. I understood that, since the Transaction, [redacted], which may be a manifestation of the Transaction's effect on competition.

144. [redacted]

145. Since the announced Transaction, [redacted] In particular, I understand that [redacted]

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163 [redacted]

164 [redacted]

165 [redacted]

166 [redacted]

167 [redacted]

[redacted][169]

Further, [redacted]

[redacted][170]

146. [redacted] Prior to the Transaction, this investment would enhance Moosomin's ability to win business from numerous sources including the opportunity to steal business from Virden. Merged elevators have no incentive to steal grain handling business from one another as the merged entity profits from sales of grain handling services at both locations. Consequently, the potential return on the investment is lower post-Transaction due to this lost business-stealing opportunity. Thus, economic theory indicates that, absent the Transaction, P&H's incentive to invest in expanding the rail track capacity at the Moosomin elevator is greater than it is with the Transaction.

147. Particularly, with the Transaction, P&H enjoys greater demand for its grain handling services and fewer elevator competitors located in the relevant market; however, it also profits from grain taken into two facilities instead of one. Without the Transaction, Moosomin theoretically has incentive to compete for grain volume with Virden [redacted] With the Transaction, however, P&H is indifferent between taking in grain at Moosomin and Virden. This suggests that P&H has less incentive to [redacted]

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168 [redacted]

169 [redacted]

170 [redacted]

[redacted] specifically, and perhaps less incentive [redacted]

6. APPENDIX

6.1. Technical Appendix – Data Structure and Cleaning

148. This Appendix explains the structure of the various data I employed for the analyses in this report, as well as all cleaning, filtering, and processing of those data to create the main datasets used for each analysis. The Appendix is organized by the data processing steps that I took:

- Building a dataset of transactions from all parties that provided reliable data
- Establishing grain handling services prices using futures price data and transaction data
- Performing sample restrictions based on service area
- Converting the transaction-level dataset into a dataset with the structure necessary for estimating the choice model.

6.1.1. Transaction Data

149. I constructed a dataset of transactions using these broad steps:

- Compiled transaction data from LDC, P&H, and third parties (ADM, Bunge, Cargill, Ceres, G3, Richardson, and Viterra)
- Standardized the relevant data fields in each file
- Calculated price paid to farm per metric tonne for the Moosomin and Virden elevators
- Constructed additional variables necessary for my analysis, including crop year, farm identifier, and flags for grains not related to the relevant product markets

- Assigned latitudinal and longitudinal coordinates to each farm based on the farm's postal code or town
- Identified each farm's census consolidated subdivision ("CCS")
- Limited the data to include only non-Nexera canola, canola that is not non-GMO, and Canadian Red Spring Wheat ("CWRS")
- Conservatively interpreted G3 data to conform with data files received from other parties.

I describe each of these steps next.

150. I received transaction-level grain purchase data from several primary grain elevators and canola crushers in the Manitoba and Saskatchewan provinces. These data include information on purchases of wheat and canola that the listed elevators made between 2013 and 2020, though some elevators report data for shorter periods. In particular, the data includes information on the farm from which the grain was purchased; the type, grade, and quantity of grain purchased; and financial information about the transaction, such as the total amount that changed hands, the price per metric tonne, or other information.[171]

151. Note that Ceres' Northgate and Duluth elevators have no farm location information included. Because farm location is essential for my analyses, I excluded these two elevators from all analyses, so I use transaction data for a total of 23 elevators.

152. I compiled LDC's Virden, Wilkie, and Yorkton transactions using four different files. For Virden and Wilkie through 2018, I used "Agris Purch Data 2016 Virden & Wilkie.xlsx" (tab labelled "Agris 2016 Purch") and LDCCA Ticket Detail 2016-2018 Virden & Wilkie.xlsx (tab labelled "Ticket Detail"). These datasets were chosen because they contain transaction-level data that contain the necessary delivery date, farm location, net quantity, and price information. These datasets have different structures because the company's front end system was updated in 2016, according to LDC's Response to the Request for Information on September 12, 2019.[172] The other datasets provided in this

[171] The list of elevators and the names of the transaction data files that I used for each can be found in my backup. See Workpaper 10.

[172] "Re: Proposed Purchase by Parrish & Heimbecker, Limited of Certain Grain Elevators and Related Assets from Louis Dreyfus Company Canada ULC," September 12, 2019 at fn. 5 (CAN_DMS_129462564_v4_LDC response to Competition Bureau RFI.pdf) ("The front end system used by LDC for the first seven months of 2016 produces a single spreadsheet (referred to herein as 'Agris Purch Data 2016') that includes both a 'sheet date' column (i.e., a 'settlement Date', as defined in footnote 6) and a 'shipment date' column (i.e., a delivery date), whereas the front end system used by LDC since that time presents the same delivery date and settlement date information

initial Response to a Request for Information included repetitive information at the more aggregate "settlement" level that did not contain all of the required fields.

153. The last delivery recorded in these two files is on December 28, 2018, so I incorporated Virden's 2019 transactions using the files "Grain Purchase Data-Virden 1-1-19 thru 10-4-19 KH (1).xlsx" for canola transactions and "Virden All Commodity Ticket Detail 2019 CWRS.xlsx" for wheat transactions. Using the "Reconcile Key" to inform my understanding of the data's fields, I used the "Ticket Detail" tab for the delivery date and net quantity of grain sold, the "Inb Scale Tickets" tab for the grower location information, and the "Assembly" tab for price information, discussed in more detail below.

154. For LDC's Yorkton crusher, I used the file "Grain Purchase Data- Yorkton req 03-24-2020 ver 2.xlsx," as it was the most granular data provided for this location and contained all the necessary fields over the relevant time period. Similar to the 2019 Virden data, I used the "Detail" tab for the delivery date and net quantity of grain sold, and I used the "Tickets" tab for the grower location information.

155. Each grain company reported these data in different formats, so I standardized important variables across datasets before I used them in my analyses.[173]

156. One variable in particular deserves further attention: price paid to the farm per metric ton. The price of grain handling services is relevant in two ways: it provides the base, pre-transaction price for calculating percentage increase in price during the HMT and the GUPPI; and it is used to estimate a markup at Virden (which in turn is used in HMT, UPP, and merger simulation). Thus, I only only need a price variable for the three elevators inside the relevant geographic market: the Moosomin, Virden, and Fairlight elevators. Conceptually, grain handling services includes a variety of services, some of which are explicitly priced. In order to ensure that the imputed price covers all of these services, I use the price actually paid to the farmer per metric ton—the *net* ("of all charges and financial incentives, the price the farm actually

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but it is broken out between two spreadsheets (referred to herein as 'LDCCA Ticket Detail 2016-2018' and 'LDCCA Settlements 2016-2018').").

[173] The main variables that I standardized across the 23 elevators that entered my final transaction data build are describe in my backup. See Workpaper 11.

receives") price—typically the lowest reasonable price reported in the dataset.[174] Since Fairlight's transactions data only offers a *gross* dollar amount, I do not construct a price for Fairlight; all variables and results for Fairlight are presented in differences only—markups (differences between prices and marginal costs) and changes from before the Transaction to after (differences over time). Next, I detail the specifics of how I implemented net price, for each of the relevant datasets.

157. The data provided by LDC and P&H included variables that listed the net quantity and total dollar value or price per metric tonne of each transaction. If not already provided, I derived price per metric tonne using the equation:

$$Price\ per\ Metric\ Tonne = \frac{Total\ Dollars}{Net\ Quantity}$$

158. For LDC's 2016 purchase data ("Agris Purch Data 2016 Virden & Wilkie.xlsx"), I calculated price per metric tonne by dividing Sheet Total by Net Quantity. According the LDC's Response to Request for Information, these are the appropriate net price and quantity fields in the data.[175]

159. The LDC 2016–2018 transaction data ("LDCCA Ticket Detail 2016-2018 Virden & Wilkie.xlsx"), includes only a gross price variable, "CAD Price," according to the corresponding Response to RFI. A net price field is only available in the 2016-2018 settlement data ("LDCCA Settlements 2016-2018 Virden & Wilkie.xlsx") as "Orig Settle Amt," which is aggregated at the settlement level.[176] In this case, the price variable is in total dollars for all metric tonnes sold in the settlement; therefore, I divided "Orig Settle Amt" by "Settled Quantity" to get an average net price per metric tonne for each settlement. I then merged this average net price per metric tonne using the settlement number.

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[174] When I was provided a party Response to Request for Information, I used the net price specified if it is available. See "Louis Dreyfus Company Canada ULC - Responses to Request for Information," May 7, 2020 (CAN_DMS_133345707_v1_LDC Response to RFI.pdf)

[175] "Re: Proposed Purchase by Parrish & Heimbecker, Limited of Certain Grain Elevators and Related Assets from Louis Dreyfus Company Canada ULC," September 12, 2019 at pp. 6–7 (CAN_DMS_129462564_v4_LDC response to Competition Bureau RFI.pdf).

[176] "Re: Proposed Purchase by Parrish & Heimbecker, Limited of Certain Grain Elevators and Related Assets from Louis Dreyfus Company Canada ULC," September 12, 2019 at pp. 6–7 (CAN_DMS_129462564_v4_LDC response to Competition Bureau RFI.pdf).

160. The file containing LDC's 2019 Virden canola transactions ("Grain Purchase Data- Virden 1-1-19 thru 10-4-19 KH (1).xlsx") reported the net price (per metric tonne) at the assembly level (in the "Assembly" tab), according to the data legend and relevant Response to RFI.[177] I merged this price field onto the transaction level data (in the "Ticket Detail" tab). Because the price was already listed per metric tonne, no additional calculation was necessary. I replicated the same procedure for the file containing LDC's 2019 Virden wheat transactions ("Virden All Commodity Ticket Detail 2019 CWRS.xlsx").

161. [redacted]

162. After standardizing the existing field names, I constructed additional variables that are necessary for the choice model that I estimate.

163. First, I create a unique farm identifier by concatenating the source file, farm name, and farm identifier. I included the source file in this identifier because I did not attempt to standardize farms across companies. For example, the same entity might appear as "John Smith," "Smith, John A.," and "Smith Farm" in three different datasets, and I treat these entries as separate farms making separate decisions.

164. I add a flag that designates the analysis time period each transaction belongs to, as discussed in Section 2.5. In particular, for wheat, I mark those transactions belonging to the 2017–2018 and 2018–2019 crop years; for canola, I mark those transactions in the period March 2018–February 2019.

165. I create flags that identify transactions that are Nexera canola or non-GMO canola. These flags will be used to exclude these transactions from all analysis because it is my understanding that these products are distinct from traditional

[177] "Louis Dreyfus Company Canada ULC - Responses to Follow Up Request for Information," July 31, 2020 at p. 2 (CAN_DMS_134676399_v1_LDC Response.PDF).

[178] [redacted]

[179] [redacted]

canola.[180] I also create a flag that indicates if the transaction was with a crusher, as I run sensitivities both with and without crushers. As shown in Workpaper 10, the five crushers for which I have data are Yorkton (LDC), Yorkton (Richardson), Altona, Harrowby, and Velva.

166. Next, I assigned latitudinal and longitudinal coordinates to each farm. I did so by finding the centroid of each farmer's postal code and determining the corresponding latitude and longitude using ArcGIS.[181] When the postal code was not populated or the postal code was invalid, I instead found the centroid of the farm's town or city and then determined the coordinates in the same manner.

167. I also include the census consolidated subdivision ("CCS") in which each farm is located. CCSs, which are used primarily for publishing Census of Agriculture data, combine both more densely populated census subdivisions with surrounding rural ones.[182] Based on the criteria for creating them, CCSs are typically at least 25 square kilometers and contain at least 16 farms.[183] Their boundaries also change infrequently, making them useful for longitudinal analysis. I added the growers' CCSs to the transaction data by using the 2016

[180] John Heimbecker Examination for Discovery, July 15, 2020, pp. 1-313 at p. 155 ("Q. What is Nexera canola? A. It's a highly specialized canola seed that primarily gets used in Japan because it is, it burns at a low temperature, smoke less and odourless."); Witness Statement of [redacted], September 3, 2020, pp. 1-13 at p. 3 ("The exception to this was last year when we grew a specialty canola crop – non-genetically modified Clearfield nexera canola - for the European market. This high leonic acid non-GMO canola was produced through a contract with Viterra. Viterra paid to have this crop shipped to its St. Agathe facility (400 km away)."); [redacted]

[181] This exercise required that I perform string cleaning on the postal codes by replacing all "O"s with "0"s because "O"s are never found in Canadian postal codes. I also fixed two postal codes ("RS0G 3N0", "3S0") that did not have the valid number of characters by searching for the associated town names.

[182] Statistics Canada, "Census consolidated subdivision (CCS)," November 16, 2016, available at https://www12.statcan.gc.ca/census-recensement/2016/ref/dict/geo007-eng.cfm, (accessed on September 2, 2020).

[183] "Census consolidated subdivisions are defined within census divisions (CDs) according to the following criteria: (1) A census subdivision (CSD) with a land area greater than 25 square kilometres can form a CCS of its own. Census subdivisions having a land area smaller than 25 square kilometres are usually grouped with a larger census subdivision. (2) A census subdivision with a land area greater than 25 square kilometres and surrounded on more than half its perimeter by another census subdivision is usually included as part of the CCS formed by the surrounding census subdivision. (3) A census subdivision with a population greater than 100,000 according to the last census usually forms a CCS on its own. (4) The census consolidated subdivision's name and code usually coincide with its largest census subdivision component in terms of land area. (5) A CCS with fewer than 16 farms in the last census is merged with adjacent CCS(s) to help reduce data suppression while maintaining the confidentiality of the data for these smaller CCSs." Statistics Canada, "Census consolidated subdivision (CCS)," November 16, 2016, available at https://www12.statcan.gc.ca/census-recensement/2016/ref/dict/geo007-eng.cfm, (accessed on September 2, 2020).

Census CCS Boundary File.[184] I performed a geospatial join of each farm's geocoded coordinates with the CCS polygon provided in the Boundary File.

168. As a result of the way in which farm's coordinates were assigned, some farms may have their locations misspecified—either because they are not physically located in their mailing postal code, or because they are located far from the centroid of the postal code. Such error might lead to attenuation bias in my estimates of farms' preference for proximity—i.e., my results might understate how much farms care about the proximity of elevators. Such bias is likely conservative; it will introduce a broader collection of elevators competing for any farm's business, thereby mitigating any anticompetitive effects of the Transaction.

169. Finally, I limited my transaction data build to include only canola and CWRS (Canadian Red Spring Wheat). This is due to the fact that Canadian Red Spring Wheat is sewn and harvested on a different schedule from other varieties of wheat that are grown in Canada. This means that transactions involving other types of wheat should not be expected to follow the same statistical models as Canadian Red Spring Wheat. Red Spring Wheat accounted for over 93% of the wheat transactions in my dataset.

170. Note that the G3 data's structure varies significantly from the other companies' transaction data; it reports net quantity of grain purchased from a given postal code at the quarterly level. Further, the data did not specify grain type, so to be conservative and overestimate the competitive importance of G3, I include all of these purchases twice—once as though they were canola, and once as though they were wheat.

171. Because I run a sensitivity of the choice model with month fixed effects, it is important that all transaction data is at least at the monthly level of granularity. In order to assign quarterly G3 transaction quantities to each month, I allocated the quarterly quantity to its constituent months in proportion to the amount of grain sold to all other elevators in that month in comparison to that quarter.[185]

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[184] "lccs000a16a_e.shp," available at https://www12.statcan.gc.ca/census-recensement/alternative_alternatif.cfm?l=eng&dispext=zip&teng=lccs000a16a_e.zip&k=%20%20%20%2015876&loc=http://www12.statcan.gc.ca/census-recensement/2011/geo/bound-limit/files-fichiers/2016/lccs000a16a_e.zip (accessed on January 17, 2020).

[185] I did so after limiting the dataset to growers within 600 km of Moosomin or Virden so that only relevant postal codes would be included in the allocations.

172. For example, I calculated the total amount of wheat sold to the other 22 elevators in the data in Q4 2017, as well as in October 2018 individually. I then found that the October transactions made up 24.9% of the wheat quarterly transactions, so I applied 24.9% of G3's wheat Q4 2018 quantity to October 2018.

6.1.2. Futures Price and Exchange Rate Data

173. To impute a price of grain handling services for each Moosomin and Virden transaction in the dataset, I used the following relation:

$$GHS\ Price = Futures\ Contract\ Price - Price\ per\ Metric\ Tonne$$

174. I downloaded futures prices for wheat from iVolatility (MW on the Minneapolis Grain Exchange) and for canola from CapitalIQ (RS on the Intercontinental Exchange).[186] I used wheat futures contracts that expired between March, 2016 through December, 2021 and canola futures contracts that expired between January 2016 through November 2019. I converted wheat futures prices from USD per bushel to CAD per metric tonne using FRED's daily historical exchange rates database and the conversion rate of 36.744 bushels of wheat per metric tonne.[187] I used FRED exchange rates beginning on January, 2, 2015 and lasting through December 31, 2019. Canola futures contracts expire in January, March, May, July, and November; wheat futures contracts expire in March, May, July, September, and December.

175. Next, I assigned each of these three elevators' transactions a "benchmark futures contract"—the futures contract most likely to be the "peg" for a farmer-elevator contract that fixes the basis in advance, and the one most likely to be the reference futures contract for a farmer-elevator contract that fixes the transaction price in advance. By reviewing the limited contract data available in the file titled "Wilkie & Virden Contract Details.xlsx," I determined that most transactions are benchmarked against futures contracts that expire less than 45

[186] [redacted]

[187] iVolatility (Minneapolis Spring Wheat Futures Data) (Accessed February 7, 2020); Capital IQ (ICE Canola Futures Data) (Accessed February 2, 2020); Canada/U.S. Exchange Rate (DEXCAUS) Data, available at https://fred.stlouisfed.org/series/DEXCAUS (accessed February 2, 2020)

days after the end of the specified delivery period. Furthermore, I noticed that trading volume tends to fall precipitously for futures contracts that expire in the very near future—within the same calendar month.

176. Thus, I assigned each relevant transaction to the futures contract that expired soonest after the delivery date, with the exception that it could not expire in the same calendar month as the delivery; in the latter case, the *next* futures contract was chosen. After choosing the relevant futures contract, I used the settle price for that contract on the day of the transaction's delivery. For example, if a canola transaction's grain was delivered on September 1, 2017, it was assigned the September 1st settle price of the contract expiring on November 15, 2017. For example, if a canola transaction's grain was delivered on November 1, 2017, the transaction was assigned the November 1st settle price of the contract expiring on January 15, 2018, since the November 15, 2017 contract expires in the same calendar month as the transaction's delivery.

177. For all transactions to elevators that are not Moosomin or Virden, I set the price of grain handling services to missing. As discussed above, prices outside the relevant geographic market (Moosomin, Virden, and Fairlight) are not relevant in any of my analyses, and Fairlight's transaction data only quotes *gross* prices, which are not comparable to the prices in the Moosomin and Virden transaction data. In my merger simulation, I use a placeholder price of zero for Fairlight transactions, since only the *change* in price and the *markup* are relevant, as discussed above.

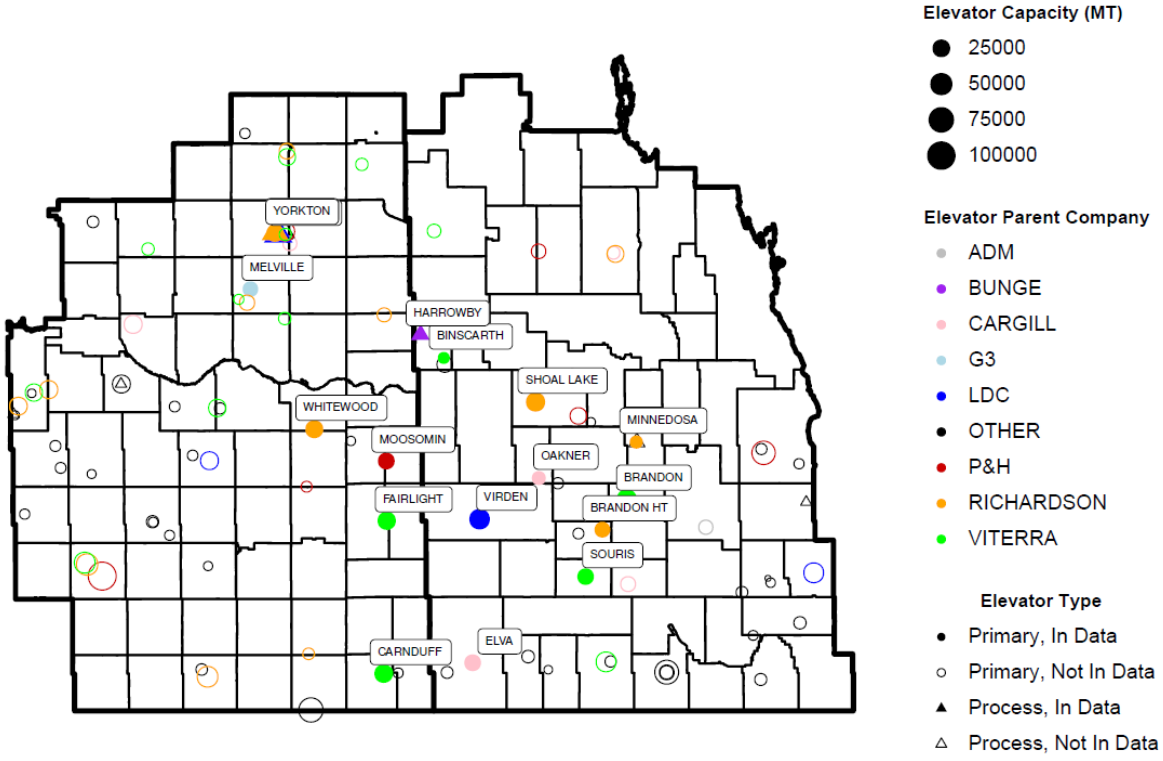
178. Exhibit 6 shows that these imputed prices involve many outliers. As a result, I focus on median prices of grain handling services for my analyses.

6.1.3. Service area sample restrictions

179. Next, I imposed a sample restriction based on service area. The main purpose of the choice model is to estimate the preferences of the farms most likely to purchase grain handling services from elevators inside the relevant geographic market—the Moosomin, Virden, and Fairlight elevators. Moosomin, Virden, and Fairlight are most likely to focus on these farms when making pricing decisions, and these farms are the most likely to be harmed by any price increase.

180. One practical limitation is that I do not have data on every elevator in Canada. Specifically, I have fairly complete data on elevators near the relevant geographic market, but lack data for many elevators further away from the geographic market. Exhibit 16 maps the locations of all elevators near the geographic market, and indicates which of these elevators have provided data.

EXHIBIT 16
Elevator locations



Source: Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files; LDC Transaction Data; P&H Transaction Data; ADM Transaction Data; Bunge Transaction Data; Cargill Transaction Data; G3 Transaction Data; Richardson Transaction Data; Viterra Transaction Data

Note: Elevators shown are primary elevators and process elevators, which include crushers. The size of each elevator is proportional to its capacity. Elevators within 200 km of Moosomin or Virden are shown. Crushers include LDC's Yorkton, Richardson's Yorkton, ADM's Velva, and Bunge's Harrowby and Altona process elevators. Data exists for several elevators that are not shown on the map because they are outside the shown area: Wilkie, Hamlin, Hanover Jct, Altona, Bloom, and Velva. Capacity was not reported for G3's Melville elevator, so it was assigned the average capacity of all elevators shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

181. The fact that many elevators further from the candidate geographic market have not provided data means that the preferences of farms further from the candidate geographic market will be poorly estimated. The model will not take into account all of the relevant choices they have, and will therefore will overestimate the desirability of the choices the model *does* include. Furthermore, to understand the pricing incentives of elevators in the candidate market, it is not necessary to model farms far from the candidate market because those farms are unlikely to purchase from any of the elevators in the candidate market.

182. Thus, I estimate the model on only those farms located within a limited, but generous, area around the elevators inside the geographic market. To determine an appropriate area, I introduce in Section 2.2 and technically define

here the concept of an elevator's *service area*, which is identified by a percentage and is a similar, but more precisely defined, entity to a draw area.[188]

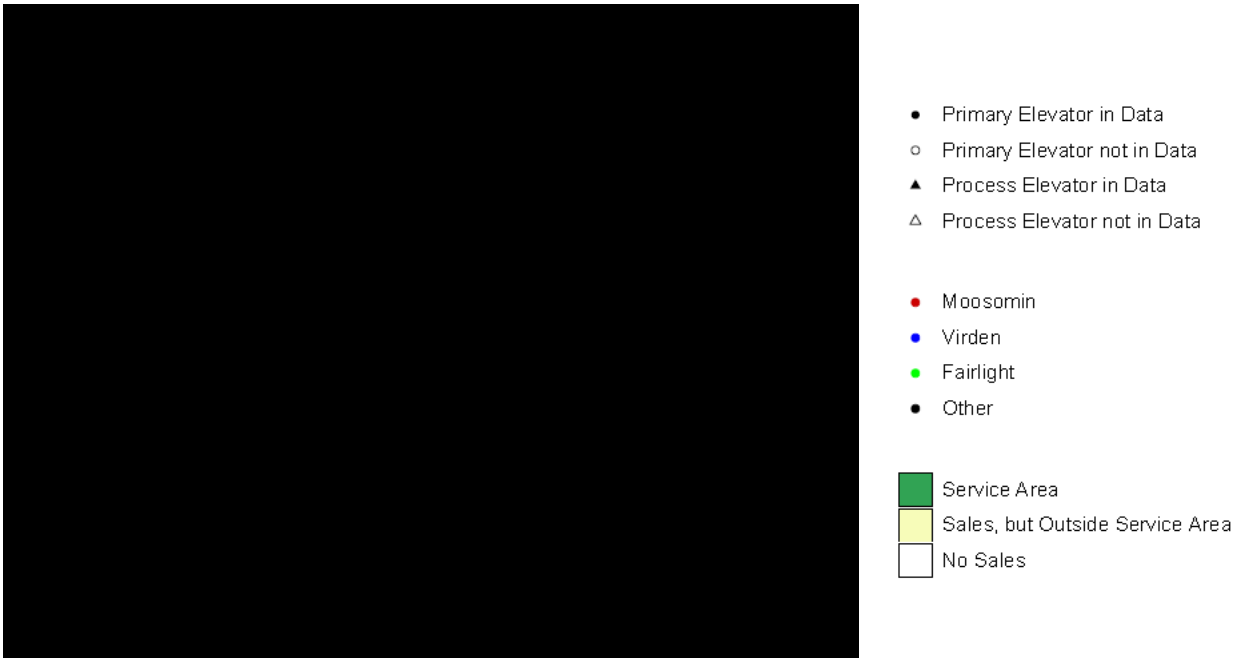
183. For example, Moosomin's 90% service area for canola during the March 2018–February 2019 period consists of the closest CCSs to Moosomin, such that they collectively account for 90% of the canola sold to Moosomin in crop year 2018. To calculate Moosomin's 90% service area for canola in crop year 2018, I perform the following steps:

- I find the fraction of canola purchased by Moosomin in crop year 2018 that comes from each CCS.
- I rank the CCSs by distance from Moosomin in ascending order.[189]
- I take the cumulative sum of the fractions in step 1 until it reaches 90%.
- I define the 90% service area as the collection of CCSs that contributed to the cumulative sum in step 3. The result for wheat is shown in Exhibit 2.

[188] [redacted]

[189] I used the "Grain Elevators in Canada" dataset provided by the Canadian Grain Commission to attribute coordinates to Moosomin, Virden, and Fairlight. Using the coordinates of the elevators, and the centroids of the farm CCSs, I then computed the Euclidean distance in kilometers from elevator to farm CCS. "cgcElevators2017.gml," available at https://open.canada.ca/data/en/dataset/05870f11-a52a-4bf4-bc15-910fd0b8a1a3 (accessed on August 29, 2020).

EXHIBIT 17
Union of 90% service areas for wheat



Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to CWRS wheat. The union of 90% service area represents the union of the CCSs in the 90% service area of Moosomin, Virden, and Fairlight. The 90% service area of each individual elevator represents the closest CCSs to the individual elevator that collectively form 90% of the total net quantity bought by the individual elevator. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. CCSs with a centriod within 200 km from Virden or Moosomin are shown.

184. I separately calculate the 90% service area for each of Moosomin, Virden, and Fairlight. Then, I take the union of all CCSs located in the service area of any of these elevators and limit the sample of farms—to only those within the union. The union of 90% service areas is shown in Exhibit 17. Because of the union, this area includes considerably more than 90% of the grain purchased by the elevators in the relevant geographic market, as shown in Exhibit 18. I also perform sensitivities using the union of the 85% and 95% service areas. Seen in the table below, the change in threshold has very little impact on the purchases included. All demand, diversion, UPP, and merger simulation analyses (including the hypothetical monopolist test) in the main text are performed on the 90% service area.

EXHIBIT 18
Share of total net quantity in the aggregate 90% service area

Elevator	90% service area (baseline)		85% service area		95% service area	
	Canola	Wheat	Canola	Wheat	Canola	Wheat
Moosomin	[redacted]					
Virden						
Fairlight						
Moosomin, Virden, and Fairlight						

Source: LDC Transaction Data; P&H Transaction Data; Viterra Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: The analysis for wheat runs from August 2018 through July 2019, and the analysis for canola runs from March 2018 through February 2019. Analysis limited to transactions within 600 km of Virden or Moosomin. Only CWRS wheat is included. Nexera and non-GMO canola is excluded. The 90%, 85% and 95% service areas represent the union of the CCSs in the 90%, 85%, or 95% service area of Moosomin, Virden, or Fairlight. The 90%, 85%, or 95% service area of each individual elevator represents the closest CCSs to the individual elevator that collectively form 90%, 85%, or 95% of the total net quantity bought by the individual elevator.

185. As a final step, I excluded from almost all analyses any farm located further than 600 km from both Moosomin and Virden, as these would be unlikely to purchase grain from any elevator within the relevant geographic market.[190] This does not eliminate any part of the 95% service area but is relevant for the few analyses conducted before performing the service area sample restriction: calculating median price of grain handling services, tabulating market shares, and measuring median distances farms ship their grains.

6.1.4. Choice Dataset

186. After deriving transaction-level price of grain handling services, I roll the data up to the farm/elevator/grain/time period[191] level, so that each row represents the total quantity of a given grain that a grower sold to an elevator within the respective time period. Once the dataset is rolled up, I filter out all observations that have a rolled net quantity that is less than or equal to zero.

[190] I determined the distances from the growers to the elevators by taking the Euclidean distance from the grower coordinate points to the elevator coordinate points. The elevator coordinate points were determined using the location information in the Grain Elevators in Canada dataset, provided by the Canadian Grain Commission (CGC).

[191] When monthly fixed effects are included in my demand estimation analysis, I rolled the transaction data up to the grower/elevator/grain/crop year/month level. For sensitivities without monthly fixed effects, I rolled the transaction data up to the grower/elevator/grain/crop year level, where "crop year" means March 2018–February 2019 for canola.

187. The choice dataset I use to estimate my demand model is based on this rolled up transaction data. I create the choice dataset as follows. For each row of the rolled up transaction data, I created one observation for each elevator from which the farm could have purchased grain handling services. For each such option, I imputed a counterfactual price of grain handling services by taking the (weighted by net quantity) median observed price of grain handling services at that elevator for that grain over the crop year or month in question, weighted by rolled net quantity. Note that I imputed the price of grain handling services before imposing any service area restrictions (discussed above), which is consistent with my posted price model.

188. I retrieved driving times and driving distances between farms and elevators options using ArcGIS and the latitudinal and longitudinal coordinates of the growers' postal codes and towns and the elevators. I used the "Grain Elevators in Canada" dataset provided by the Canadian Grain Commission to attribute coordinates to each of the 23 elevators in the choice dataset. I retrieved these times and distances using ArcGIS on August 18, 2020 at 14:51 CDT.[192]

[192] "cgcElevators2017.gml," available at https://open.canada.ca/data/en/dataset/05870f11-a52a-4bf4-bc15-910fd0b8a1a3. I manually assigned the coordinates of ADM's Velva elevator and G3's Melville elevator using Google Maps (accessed on August 3, 2020).

6.2. Farm choice model

189. I estimate a standard conditional logit model of elevator choice, in which each farm ranks each available elevator based on a utility score and selects the top-ranked option. The utility score assigned to each option consists of three components: (1) driving time, (2) preferences about each elevator, and (3) a stochastic term that allows for the fact that farms with identical driving time and preference for elevators may make different choices for reasons that I cannot measure.

190. Formally, each farm i assigns a utility level u_{ij} to elevator j. The utility function is specified as follows:

$$u_{ij} = \delta_j + \beta_j x_{ij} + \epsilon_{ij}$$

191. where x_{ij} is the driving time from farm i to elevator j, δ_j is the elevator fixed effect which captures the specific elevator preferences, and ϵ_{ij} is a stochastic term distributed type-I extreme value. The parameter of interest is β_j which governs how much farms value differences in the driving time.

192. Because farmers' shipments vary in a wide range, I use net quantity shipped as weights to make the analysis representative of the market reality. The net quantity shipped is constructed using the transaction data in year 2017. More details about data cleaning and transaction dataset are presented in Appendix Section 6.1.

193. Note that while price is not explicitly included in the model, the elevator fixed effects implicitly include preferences related to price. It would be convenient if I could explicitly model farms' price sensitivity here. However, as discussed above, prices for grain handling services at a transaction level are likely not measured precisely. Thus, instead, I calibrate farms' price sensitivity in the merger simulation process, discussed in Appendix Section 6.5 below, using calculated markups, discussed in Appendix Section 6.4.1 below.

194. I use the maximum likelihood estimation approach to estimate the farmer choice model.

6.2.1. Demand estimates

195. The estimated demand coefficients represent the additional utility a farm would receive from a marginal increase in the modeled characteristic. The coefficients establish a framework for quantifying how farms' decisions will respond to changes in elevator and market characteristics, which can be used to model how competition among elevators disciplines prices. When calibrating my merger simulation model below, I pair these coefficients with markup data to infer how sensitive farms are to the price of grain handling services, as well as how strongly farms must value proximity to rationalize the decisions they make in the data.

196. In Exhibit 19, I report the estimates from my demand model. I find that farmers place significant and negative value on the driving time to the elevators, wherein they are more likely to choose elevators requiring less driving time. I also include sensitivities where I use an 85% or 95% service area. The results are similar, which suggests that the overall conclusions do not hinge on the particular sample restriction.

EXHIBIT 19
Estimates of demand model

	90% Service Area (baseline)		85% Service Area		95% Service Area	
Wheat	**Yearly**	**Monthly**	**Yearly**	**Monthly**	**Yearly**	**Monthly**
Driving Time	-0.0933***	-0.0961***	-0.0933***	-0.0961***	-0.0895***	-0.0924***
	(0.0044)	(0.0039)	(0.0044)	(0.0039)	(0.0037)	(0.0035)
Fixed Effects	Elevator	Elevator x Month	Elevator	Elevator x Month	Elevator	Elevator x Month
Observations	27,855	64,003	27,855	64,003	29,580	68,116
Log Likelihood	-1.137e+06	-1.043e+06	-1.137e+06	-1.043e+06	-1.232e+06	-1.134e+06
Canola Including Crushers						
Driving Time	-0.0765***	-0.0782***	-0.0777***	-0.0796***	-0.0698***	-0.0718***
	(0.0034)	(0.0035)	(0.0038)	(0.0039)	(0.0034)	(0.003)
Fixed Effects	Elevator	Elevator x Month	Elevator	Elevator x Month	Elevator	Elevator x Month
Observations	35,720	71,708	33,320	66,149	41,860	86,538
Log Likelihood	-988122	-887715	-923476	-825192	-1.161e+06	-1.048e+06
Canola Excluding Crushers						
Driving Time	-0.1047***	-0.1062***	-0.1113***	-0.1135***	-0.0973***	-0.0998***
	(0.0049)	(0.0047)	(0.0053)	(0.0051)	(0.0053)	(0.0051)
Fixed Effects	Elevator	Elevator x Month	Elevator	Elevator x Month	Elevator	Elevator x Month
Observations	21,135	40,104	19,395	36,060	24,585	48,873
Log Likelihood	-440860	-390343	-384879	-335987	-502690	-444477

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: LDC Transaction Data; P&H Transaction Data; ADM Transaction Data; Bunge Transaction Data; Cargill Transaction Data; G3 Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Grain Elevators in Canada Data; Capital IQ ICE Canola Futures Data; 2016 Census Program CCS Boundary Files

Note: The analysis for wheat runs from August 2018 through July 2019, and the analysis for canola runs from March 2018 through February 2019. Each model controls for drive times to each elevator choice and clusters standard errors at the farm-chosen elevator level. Monthly models are weighted by net quantity sold per grower per crop year and month to the chosen elevator, yearly models are weighted by net quantity sold per grower per crop year to the chosen elevator. See Appendix Section 6.1 for details on data processing and sample restrictions. Nexera and non-GMO canola are excluded.

6.3. Diversion ratio

197. I calculate the diversion ratios based on my demand model estimates. Given that I assume a posted price model throughout this report, I calculate a uniform pricing diversion ratio. In particular, the diversion ratio from elevator j_1 to j_2, $Diversion\ ratio_{j_1 \to j_2}$, is defined and computed as follows, using properties of logit demand:

$$Diversion\ ratio_{j_1 \to j_2} \equiv \frac{\frac{dQ_{j_2}}{dP_{j_1}}}{-\frac{dQ_{j_1}}{dP_{j_1}}}$$

$$Diversion\ ratio_{j_1 \to j_2} = \frac{\sum_i Q_i \frac{dProb_{i,j_2}}{dP_{j_1}}}{-\sum_i Q_i \frac{dProb_{i,j_1}}{dP_{j_1}}}$$

198. Assuming that $\delta_j = \widetilde{\delta_j} - \alpha P_j$, as in Appendix Section 6.5.1 below:

$$Diversion\ ratio_{j_1 \to j_2} = \frac{\sum_i Q_i \alpha Prob_{i,j_2} Prob_{i,j_1}}{-\sum_i Q_i (-\alpha) Prob_{i,j_1} (1 - Prob_{i,j_1})}$$

$$Diversion\ ratio_{j_1 \to j_2} = \frac{\sum_i Q_i Prob_{i,j_1} Prob_{i,j_2}}{\sum_i Q_i Prob_{i,j_1} (1 - Prob_{i,j_1})}$$

where $Prob_{i,j}$ represents the probability (considering unobservable idiosyncratic preferences) that farm i will choose elevator j.

199. In Exhibit 20, I compare the diversion ratios depicted in the main text with those that would prevail under an 85% or 95% service area sample restriction. Again, the results are similar, which suggests that the overall conclusions do not hinge on the particular sample restriction.

EXHIBIT 20

Diversion ratios under alternative sample restrictions

Grain	90% Service Area (Baseline)		85% Service Area		95% Service Area	
	Diversion from Moosomin to Virden	Diversion from Virden to Moosomin	Diversion from Moosomin to Virden	Diversion from Virden to Moosomin	Diversion from Moosomin to Virden	Diversion from Virden to Moosomin
Wheat	[redacted]					
Canola Including Crushers						
Canola Excluding Crushers						

Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: The analysis for wheat runs from August 2018 through July 2019, and the analysis for canola runs from March 2018 through February 2019. Analysis limited to transactions in the 90%, 85%, or 95% service area and within 600 km of Moosomin or Virden. Nexera and non-GMO canola are excluded. Only CWRS wheat is included. The 90%, 85%, or 95% service areas represent the union of the CCSs in the 90%, 85%, or 95% (respectively) service areas of Moosomin, Virden, or Fairlight. The 90%, 85%, or 95% service area of each individual elevator represents the closest CCSs to the individual elevator that collectively form 90%, 85%, or 95% (respectively) of the total net quantity bought by the individual elevator. Diversion ratios are weighted by net quantity sold per farm per crop year to the chosen elevator. Diversion ratios are based on a choice model that controls for drive times to each elevator choice and is weighted by net quantity sold per grower per crop year to the chosen elevator. The canola crushers in the data are ADM's Velva, Bunge's Altona and Harrowby, LDC's Yorkton, and Richardson's Yorkton canola crushers.

6.4. UPP and GUPPI

200. To calculate the UPP and GUPPI measures, I need three components: diversion ratios, elevators' markups, and elevators' prices. Diversion ratios and prices have been extensively discussed in Appendix Sections 6.3 and 6.1, respectively. In this section, I describe how to calculate elevators' markups and the formula for UPP and GUPPI calculation.

6.4.1. Markup calculation

201. I calculate LDC Virden's markup using the median price of grain handling services from transaction data and the cost items from the profit and loss statement. In particular, I use the 2017, 2018, and 2019 Calendar Year Virden P&L statements to determine the marginal cost.[193] These files contain line items of expenses and revenues.

202. Economic theory says that *marginal cost*—the cost of producing one extra unit of goods or services—is what drives pricing. Marginal cost is an abstract concept not recorded in data. Concrete costs recorded in data can be broken into *fixed costs*, which do not change no matter how many units of goods or services are produced, and *variable costs*, which scale with the size of the operation. If marginal costs are constant—i.e., do not vary with the amount of goods or services being produced—then average variable cost—total variable cost divided by units produced—must equal marginal cost. Thus, in processing the accounting data, I include only those cost items, which represent the *variable cost* of grain handling services. In order to categorize the line items into the types of expenses/revenues detailed below, I join the data found in "LDCANADA P&L 2017 Virden & Wilkie.xlsx" and "LDCANADA P&L 2018 Virden & Wilkie.xlsx" by the account number.[194] I focus on expenses at Virden only, since LDC provided more detailed cost data.

[193] 2017 P&L by Location by Month.xlsx, "Accounts Summary" sheet; 2018 P&L by Location by Month.xlsx. "Combined" sheet; #4 Virden A.xlsx, "Virden 2019 PL" sheet.

[194] When I am not successful in assigning a type to a line item in a given month, I determine the type by finding a line item with the same account description, type of expense (six digit code), function (1 digit code), and product type (wheat, canola, general) whose type is populated. Note that this is not necessary for the 2019 cost data because the cost data already contains corresponding types.

203. First, I exclude any accounts with Function "1," which indicates "Trading" activities according to the Legend produced in response to the SIR.[195] Second, we note that the remaining Main Account numbers begin with "5," "6," "7," and "8." I discuss these one at a time, as it is conventional to categorize different types of accounts using the leading digit:

- "5" contains what appear to be various revenue accounts, the vast majority of which have credit balances. Thus, I exclude all of these accounts. The one apparent exception is corporate basis, which should be excluded anyway on the grounds that it is a fixed cost.
- "6" contains what appear to be gains and losses, electricity, and insurance. I exclude "FX ON ELEV COSTS" since it is categorized as "Fixed," "PRE-AUDIT (GAIN)LOSS" since it is generally a credit and therefore conservative to exclude, and include all other accounts since they are generally debits and therefore conservative to include.
- "7" appear to be expenses. We include "Employee Expenses" and "Variable," but exclude "Fixed" and "Depreciation."
- "8" corresponds to only one account, "NBV OF ASSETS SOLD," and appears only once in December 2017. This does not represent a real monthly cost, so it is excluded.

204. Some accounts are associated with specific grains, while others are not. The latter are distributed across the grains in proportion to their put through volume. The sum of the costs for a given grain is divided by the put through volume to obtain a marginal cost per metric tonne, which is then converted from USD to CAD using the annual conversion rate provided by the Bank of Canada.[196] One cost that I exclude that is worth further discussion is freight cost. First, these accounting statements attribute freight to the trading business, which is part of a separate product market, as discussed above in Section 3. Second, freight does not conceptually belong in the *marginal cost* of providing grain handling services since the *price* I imputed for these services does not include freight service. The futures market price does not capture the increased value of the grain after it has been shipped to the coast. Therefore, it is most appropriate *not* to include freight as a cost of grain handling services.

[195] Legend.xlsx, "Legend" sheet.

[196] Bank of Canada Annual Average Canada/U.S. Exchange Rate Data (FX_RATES_ANNUAL-sd-2017-01-01.csv), available at https://www.bankofcanada.ca/rates/exchange/annual-average-exchange-rates/ (accessed on August 27, 2020).

205. I also did not include any adjustment for differences in freight costs relative to the theoretical expected costs to ship from the futures market location. For Canola, there is no adjustment to consider as the futures market location is Saskatchewan. For wheat, as discussed above, most shipments flows east or west, to ports at Thunder Bay or Vancouver, while the futures prices that I used for wheat are based on delivery in Minneapolis. Minneapolis is not appreciably closer to coastal ports than the Moosomin or Virden elevators are.

206. Since monthly data was not provided for calendar year 2019, for wheat (crop year 2018–2019) and canola (March 2018–February 2019), I perform these steps at an annual level for 2018 and 2019 separately, and then take the simple average of the result. For wheat (crop year 2017–2018, relevant only for my workpapers and not presented in Exhibit 21 below), I perform these steps monthly, using only the data from August 2017–July 2018.

207. Markup is defined as price less marginal cost. I use the median price of grain handling services at Virden over the relevant time period (crop year 2018–2019 or 2017–2018 for wheat, March 2018–February 2019 for canola). I show the markup calculation in Exhibit 21.

EXHIBIT 21
LDC Virden markup

Grain	Median Price of Grain Handling Services [A]	Cost per MT [B]	Markup [A] – [B]	Margin ([A] – [B])/[A]
Wheat	[redacted]			
Canola				

Source: 2018 and 2019 LDC P&L Statements; 2018 & 2019 LDC Throughput Data; LDC Transaction Data; Grain Elevators in Canada Data; Canada/U.S. Exchange Rate (DEXCAUS) Data; iVolatility Minneapolis Spring Wheat Futures Data; Capital IQ ICE Canola Futures Data; Bank of Canada Annual Average Canada/U.S. Exchange Rate Data

Note: The median price is calculated using all farms that sell to Virden and that are located within 600 km of either Virden or Moosomin. The median price calculation for wheat includes only CWRS wheat and runs from August 2018 through July 2019. The median price calculation for canola excludes Nexera and non-GMO canola and runs from March 2018 through February 2019. See Section 2.5 for details. The Cost per MT reflects the average of the 2018 and 2019 Cost per MT. In order to find the 2018 and 2019 Cost per MT, 2018 and 2019 costs were taken from LDC's 2018 and 2019 P&L Statements, then converted to CAD using Bank of Canada Annual Average Canada/U.S. Exchange Rates, and finally divided by volumes taken from LDC's 2018 and 2019 Throughput Data. See Appendix Section 6.4.1 for a detailed description of the cost per MT calculation.

6.4.2. UPP and GUPPI formulas

208. As I discussed in Section 5.4, UPP and GUPPI are calculated to measure the merging parties' incentives to increase the prices due to a merger.

209. The UPP measures the incentives of the merging firms to raise price, and approximates the likely price increases. Formally, the UPP from elevator i to elevator j is defined as follows:

$$UPP_{i\to j} = Diversion\ ratio_{i\to j} \times Markup_j$$

210. The GUPPI measures this price increasing incentive relative to its own product price, thus the effect is in percentage. Formally, the GUPPI from elevator i to elevator j is defined as follows:

$$GUPPI_{i\to j} = Diversion\ ratio_{i\to j} \times \frac{Markup_j}{Price_i}$$

6.5. Technical description of merger simulation model

6.5.1. Exposition

211. The merger simulation model features two types of agents: farmers and firms. The model features no linkages across grains; they are two completely separate models.

212. The way we estimate farms' preferences and behavior has already been described in Appendix Section 6.2, except for their price sensitivity. In particular, I assume that farms' utility is given by

$$u_{ij} = \delta_j + \beta_j x_{ij} + \epsilon_{ij}$$

213. I assume that $\delta_j \equiv \widetilde{\delta_j} - \alpha P_j$, where α captures the farms' sensitivity to price of grain handling services.

214. Then, given a collection of prices P_j, a farmer i derives expected utility

$$U_i = \ln \sum_j \exp v_{ij}$$

where $v_{ij} = u_{ij} - \epsilon_{ij}$.

215. A firm $f \in F$ owns elevators $J_f \subseteq \mathcal{J}$. Each elevator j faces a constant marginal cost C_j. Thus, firm f earns expected profit

$$\pi_f = \sum_{j \in J_f} (P_j - C_j) \sum_i Q_i Prob_{ij}$$

where Q_i represents the amount of grain sold by farmer i and $Prob_{ij}$ represents the probability that farmer i sells to elevator j and is given in the logit case by by

$$Prob_{ij} = \frac{exp(u_{ij})}{\sum_{j'} exp(u_{ij'})}.$$

Each firm sets its prices simultaneously, maximizing profit given all other firms' prices. This represents a Nash-Bertrand equilibrium.

216. Given that the geographic market consists of only the Moosomin, Virden, and Fairlight elevators, there are three firms before the Transaction and two firms after the Transaction. Implicitly, all elevators outside the market are assumed to hold their prices fixed, and I do not model their profit functions.

217. Overall welfare is given as follows:

$$W = \frac{1}{\alpha} \sum_i U_i + \sum_f \pi_f$$

218. Technically, the *level* of consumer surplus is not determined, as behavior would be the same if it were increased by a constant. Therefore, only *changes* in consumer or total surplus are determined.

6.5.2. Calibration

219. In order to proceed with the merger simulation, I must assign values to the parameters. In particular, I do so by enforcing the assumption that, pre-Transaction, firms were maximizing profits.

220. The first step is calculating the markup earned by the Virden elevator, just performed in Appendix Section 6.4.1.

221. The second step is to infer the price coefficient of demand α by assuming that the Virden elevator was maximizing profit before the Transaction. In particular, the first order condition for Virden is

$$\sum_i Q_i Prob_{i,Virden} = -(P_{Virden} - C_{Virden}) \sum_i Q_i \frac{dProb_{i,Virden}}{dP_{Virden}}$$

$$\sum_i Q_i Prob_{i,Virden} = (P_{Virden} - C_{Virden})\alpha \sum_i Q_i Prob_{i,Virden}(1 - Prob_{i,Virden})$$

$$\alpha = \frac{\sum_i Q_i Prob_{i,Virden}}{(P_{Virden} - C_{Virden}) \sum_i Q_i Prob_{i,Virden}(1 - Prob_{i,Virden})}$$

222. The third step in the calibration process is to infer the pre-Transaction markup earned by every other elevator in the relevant market, again by assuming profit maximization before the Transaction. The same condition can be rearranged as follows:

$$(P_j - C_j) = \frac{\sum_i Q_i Prob_{ij}}{\alpha \sum_i Q_i Prob_{ij}(1 - Prob_{ij})}$$

223. Finally, while the model operates entirely in markups and changes in markups, I find it easier to discuss and program the model in terms of prices and marginal costs. Thus, I infer a marginal cost from the inferred markup. For Moosomin, this involves subtracting the markup from the observed median price of grain handling services. For Fairlight, I do not observe the price of grain handling services. Thus, I use a "placeholder" price of zero, and infer a "placeholder" marginal cost that is the opposite of the markup.

224. As discussed in the main text, the result of this process is summarized in Exhibit 13. The calibrated parameters are reasonable.

6.5.3. Simulation

225. To simulate the results of the Transaction, I solve the three profit-maximizing first order conditions simultaneously. The Fairlight equation is the same:

$$\sum_i Q_i Prob_{i,Fair} = (P_{Fair} - C_{Fair})\alpha \sum_i Q_i Prob_{i,Fair}(1 - Prob_{i,Fair})$$

Meanwhile, the Moosomin and Virden first order conditions have changed to reflect new incentives as a merged entity. With respect to the price of Virden:

$$\sum_i Q_i Prob_{i,Virden} + (P_{Moos} - C_{Moos}) \sum_i Q_i \frac{dProb_{i,Moos}}{dP_{Virden}} = (P_{Virden} - C_{Virden})\alpha \sum_i Q_i Prob_{i,Virden}(1 - Prob_{i,Virden})$$

Using the expression for the derivative:

$$\sum_i Q_i Prob_{i,Virden} + (P_{Moos} - C_{Moos})\alpha \sum_i Q_i Prob_{i,Moos} Prob_{i,Virden} = (P_{Virden} - C_{Virden})\alpha \sum_i Q_i Prob_{i,Virden}(1 - Prob_{i,Virden})$$

And the analogous first order condition for Moosomin:

$$\sum_i Q_i Prob_{i,Moos} + (P_{Virden} - C_{Virden})\alpha \sum_i Q_i Prob_{i,Moos} Prob_{i,Virden} = (P_{Moos} - C_{Moos})\alpha \sum_i Q_i Prob_{i,Moos}(1 - Prob_{i,Moos})$$

226. I derive similar first order conditions for conducting they hypothetical monopolist test.

6.5.4. Monthly sensitivity

227. To rule out the possibility that the elevators in the relevant geographic market demand grain at different points in time, and therefore do not actually compete closely, I also consider a monthly model. In this case, I assume price and marginal cost at each elevator varies over time. In particular, I assume that both price and marginal cost are month-specific, with no linkage across months. Thus, the model behaves as twelve separate, monthly models, each specified exactly as above. For clarity, I observe monthly median grain handling services prices in the data, which I use for this monthly model.

228. The only difficulty presents in calibration. In the yearly model, marginal cost for Virden was inferred directly from the markup data, while α was then inferred from Virden's first order condition, given marginal cost. In a monthly model, I do not observe each month's markup, but rather the annual average. Furthermore, because I use a *median* price, it would be inappropriate to match the *mean* markup across months (which involves a mean of median monthly prices) to the annual markup shown Exhibit 21 (which involves the annual

median price). To avoid this problem, I match the mean *marginal cost* across months to the annual *marginal cost* shown in Exhibit 21. In particular, I assume that the observed marginal cost represents the average calibrated monthly marginal cost across farmers that *actually chose Virden*, weighted by the quantity they sold.

229. Given this interpretation, I calibrate the 12 monthly marginal costs at Virden, plus α, using 13 conditions: The 12 monthly first order conditions at Virden, plus the condition that the weighted average marginal cost across farmers that actually chose Virden, and across all months, matches the observed marginal cost. In particular,

$$\sum_i Q_i^m Prob_{i,Virden}^m = (P_{Virden}^m - C_{Virden}^m)\alpha \sum_i Q_i^m Prob_{i,Virden}^m \left(1 - Prob_{i,Virden}^m\right) \ \forall m$$

$$\frac{\sum_{i,m} Q_i^m 1\left[Chosen_{i,Virden}^m\right] C_{Virden}^m}{\sum_{i,m} Q_i^m 1\left[Chosen_{i,Virden}^m\right]} = C_{Virden}^{annual}$$

where C_{Virden} denotes the observed average variable cost (which I assume is similar to marginal cost) at Virden.

230. After establishing α, calibration of the other marginal costs and simulation of the post-Transaction equilibrium proceeds precisely as before, one month at a time.

231. Exhibit 22 presents the welfare results for this monthly sensitivity. The results are qualitatively extremely similar to the baseline model in the main text.

EXHIBIT 22
Welfare results, monthly sensitivity

		Before Acquisition [A]	After Acquisition [B]	Change [B] - [A]
Wheat	Consumer Surplus	[redacted]		
	Total Profit			
	Total Surplus			
Canola Including Crushers	Consumer Surplus			
	Total Profit			
	Total Surplus			
Canola Excluding Crushers	Consumer Surplus			
	Total Profit			
	Total Surplus			

Source: LDC Transaction Data; P&H Transaction Data; ADM Transaction Data; Bunge Transaction Data; Cargill Transaction Data; G3 Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Grain Elevators in Canada Data; Canada/U.S. Exchange Rate (DEXCAUS) Data; iVolatility Minneapolis Spring Wheat Futures Data; Capital IQ ICE Canola Futures Data; 2018 and 2019 LDC P&L Statements; 2018 & 2019 LDC Throughput Data; 2016 Census Program CCS Boundary Files; Bank of Canada Annual Average Canada/U.S. Exchange Rate Data

Note: The analysis for wheat runs from August 2018 through July 2019, and the analysis for canola runs from March 2018 through February 2019. All figures are in thousands of Canadian dollars. Analysis limited to transactions in the 90% service area and within 600 km of Moosomin or Virden. Nexera and non-GMO canola are excluded. Only CWRS wheat is included. The 90% service areas represent the union of the CCSs in the 90% service areas of Moosomin, Virden, or Fairlight. The 90% service area of each individual elevator represents the closest CCSs to the individual elevator that collectively form 90% of the total net quantity bought by the individual elevator. The canola crushers in the data are ADM's Velva, Bunge's Altona and Harrowby, LDC's Yorkton, and Richardson's Yorkton canola crushers. Specification, calibration, and simulation of the merger simulation model are described in Section 5.5. and are based on the farm choice model (Section 5.3). Consumer surplus and total surplus are not determined in levels, only in differences.

6.6. Comparison of merger simulation results to UPP

232. As a verification that the simulation results are consistent with other evidence presented in this report, I can compare the price changes predicted by the UPP analysis of Section 5.4.2 to the price changes predicted by the merger simulation analysis.

233. As discussed in Section 5.4.2, UPP calculates an increase in the (opportunity) cost of competing for market share by lowering price—lost profit at the merged partner. Thus, it does not directly represent a predicted increase in price. Instead, such an increase in price depends on the rate of *passthrough*—the percentage of an increase in marginal cost that is passed on to customers.

234. Importantly, elevators will rationally respond to competitors' price increases with price increases of their own. Thus, Moosomin (for example) will pass through increases not only in its own marginal costs, but also to a lesser extent those seen by competing elevators. In order to compare the price changes predicted by these two analyses, I approximate this passthrough by separately artificially increasing each elevator's marginal cost by a small amount and simulating the model. After obtaining passthrough in this fashion, I use it, together with the UPP results of Section 5.4.2, to calculate anticipated price changes. The results of this exercise, compared with the results of the merger simulation analysis, are presented in Exhibit 23. We observe that the price increases predicted by the UPP analysis are extremely similar to those predicted by the merger simulation, which further reinforces their validity.

EXHIBIT 23
Comparison of UPP results and merger simulation results

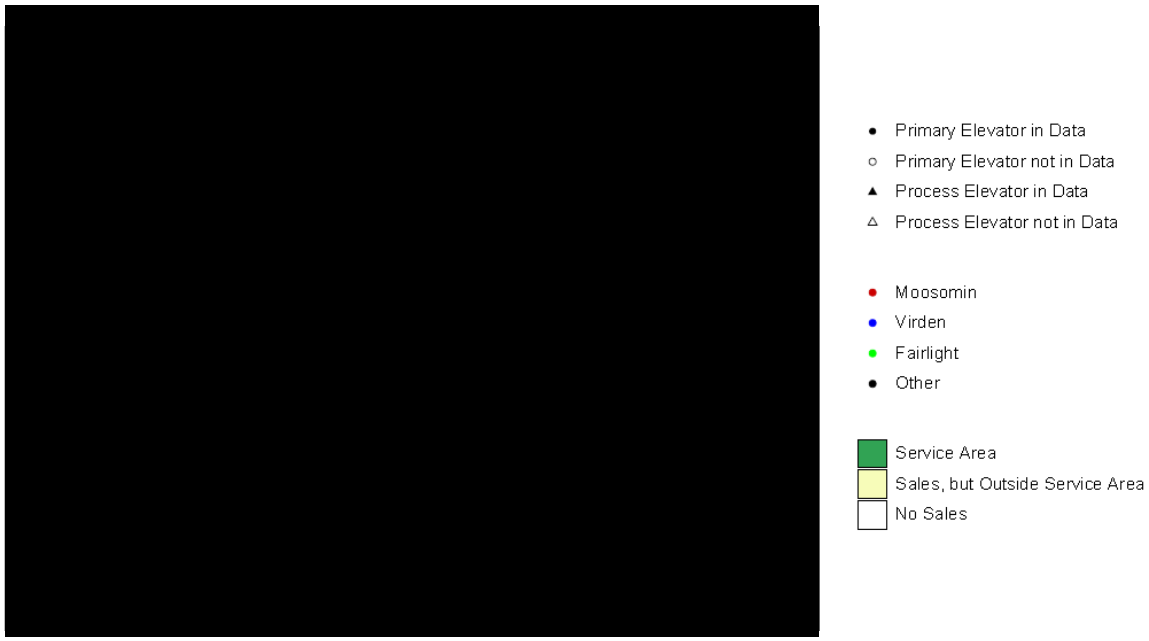
Grain	Diversion from Moosomin to Virden	Diversion from Virden to Moosomin	Moosomin			Virden		
			UPP	UPP Predicted Price Change	Model Simulated Price Change	UPP	UPP Predicted Price Change	Model Simulated Price Change
Wheat	[redacted]							
Canola Including Crushers								
Canola Excluding Crushers								

Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; Canada/U.S. Exchange Rate (DEXCAUS) Data; iVolatility Minneapolis Spring Wheat Futures Data; Capital IQ ICE Canola Futures Data; 2018 and 2019 LDC P&L Statements; 2018 & 2019 LDC Throughput Data;2016 Census Program CCS Boundary Files; Bank of Canada Annual Average Canada/U.S. Exchange Rate Data

Note: The analysis for wheat runs from August 2018 through July 2019, and the analysis for canola runs from March 2018 through February 2019. Analysis limited to transactions in the 90% service area and within 600 km of Moosomin or Virden. Nexera and non-GMO canola are excluded. Only CWRS wheat is included. The 90% service areas represent the union of the CCSs in the 90% service areas of Moosomin, Virden, or Fairlight. The 90% service area of each individual elevator represents the closest CCSs to the individual elevator that collectively form 90% of the total net quantity bought by the individual elevator. The canola crushers in the data are ADM's Velva, Bunge's Altona and Harrowby, LDC's Yorkton, and Richardson's Yorkton canola crushers. See Section 5.4 and Exhibit 12 for discussion of UPP. See Section 5.5 and Exhibit 14 for discussion of merger simulation results.

6.7. Wheat and canola service area maps for all modeled elevators

EXHIBIT 24
90% canola service area for the Altona elevator (crusher)

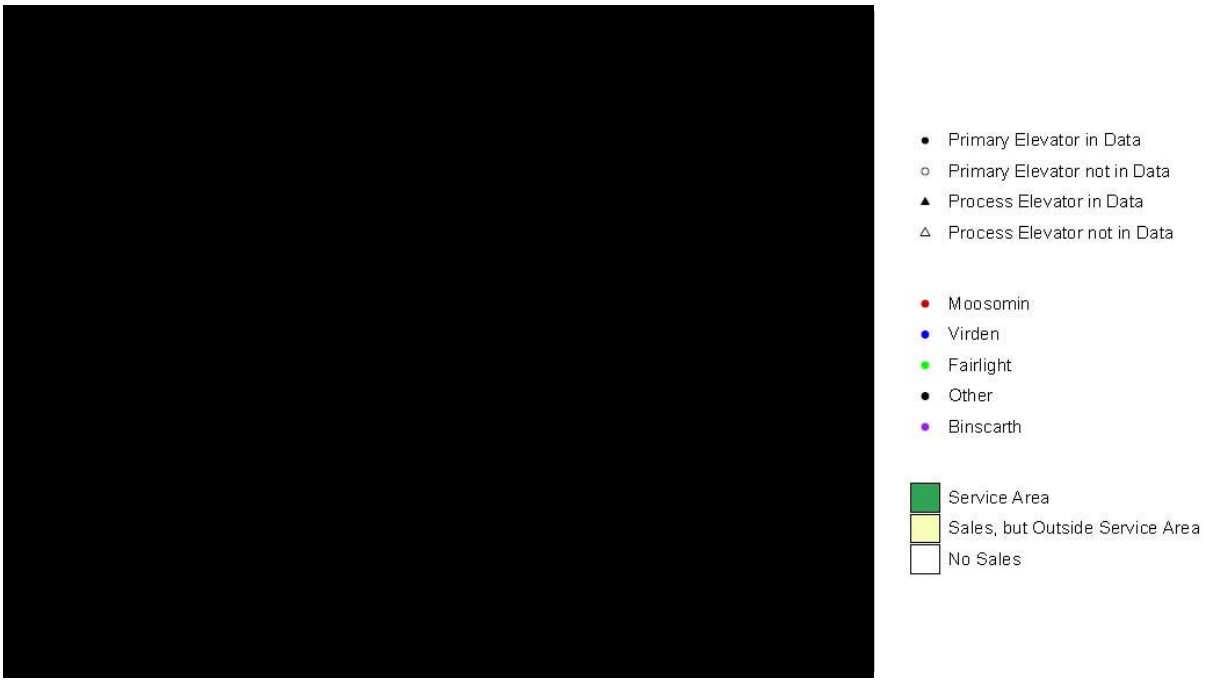


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to canola transactions during March 2018–February 2019. Nexera and non-GMO canola are excluded. The service area represents the closest CCSs to Altona that collectively form 90% of the total net quantity bought by Altona. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data. The Altona elevator is more than 200 km from Moosomin and Virden and therefore is not shown on this map.

EXHIBIT 25

90% canola service area for the Binscarth elevator

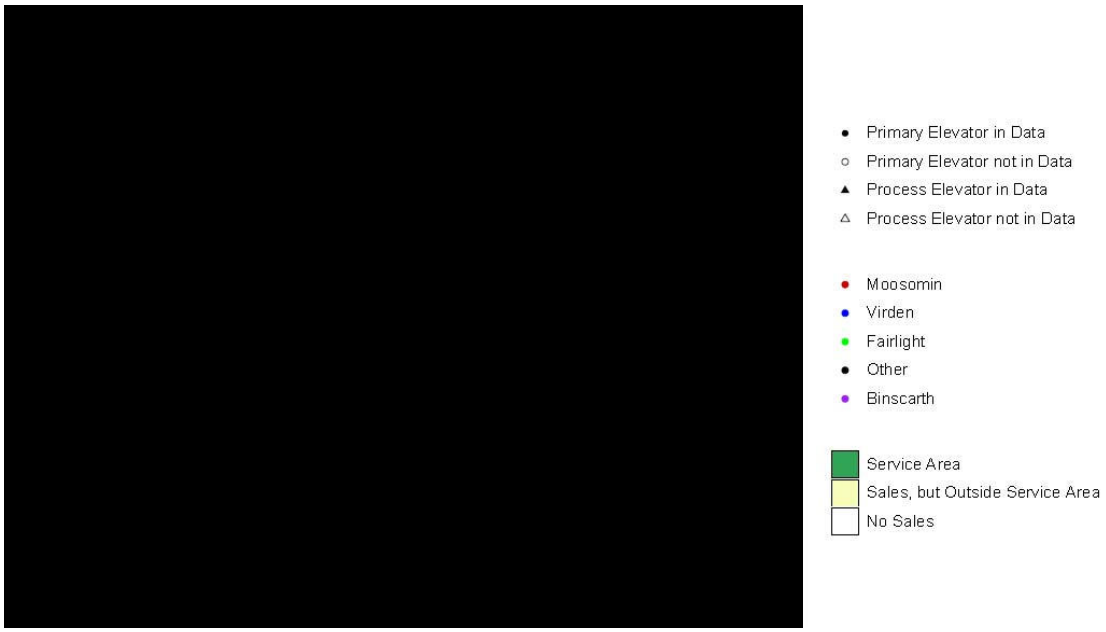


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to canola transactions during March 2018–February 2019. Nexera and non-GMO canola are excluded. The service area represents the closest CCSs to Binscarth that collectively form 90% of the total net quantity bought by Binscarth. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 26

90% wheat service area for the Binscarth elevator

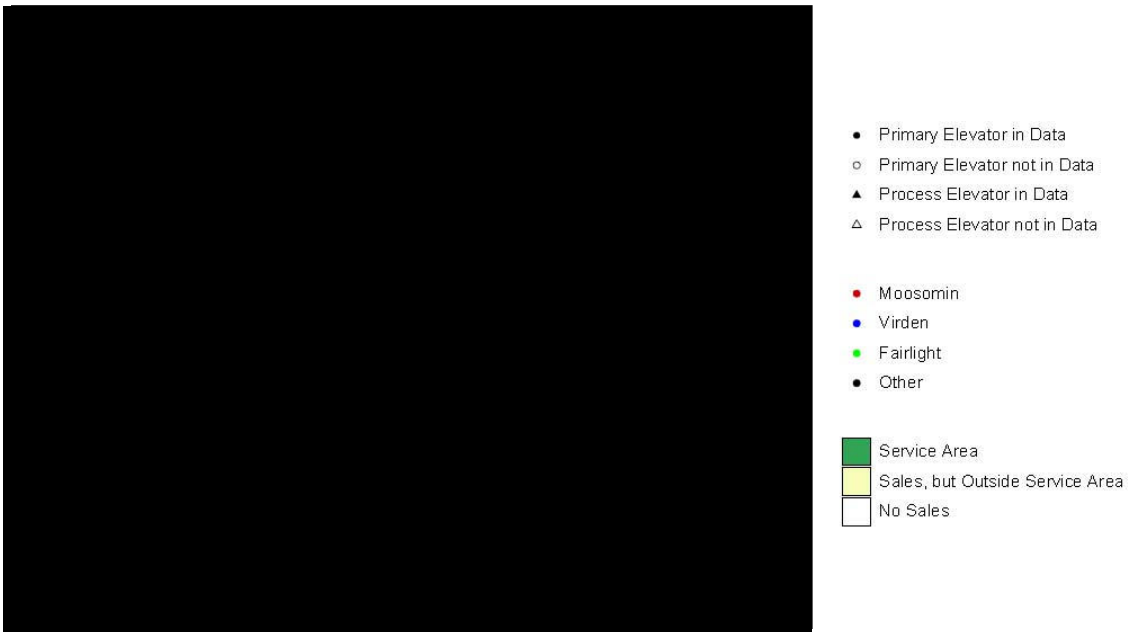


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to CWRS wheat transactions during August 2018–July 2019. The service area represents the closest CCSs to Binscarth that collectively form 90% of the total net quantity bought by Binscarth. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 27

90% canola service area for the Bloom elevator

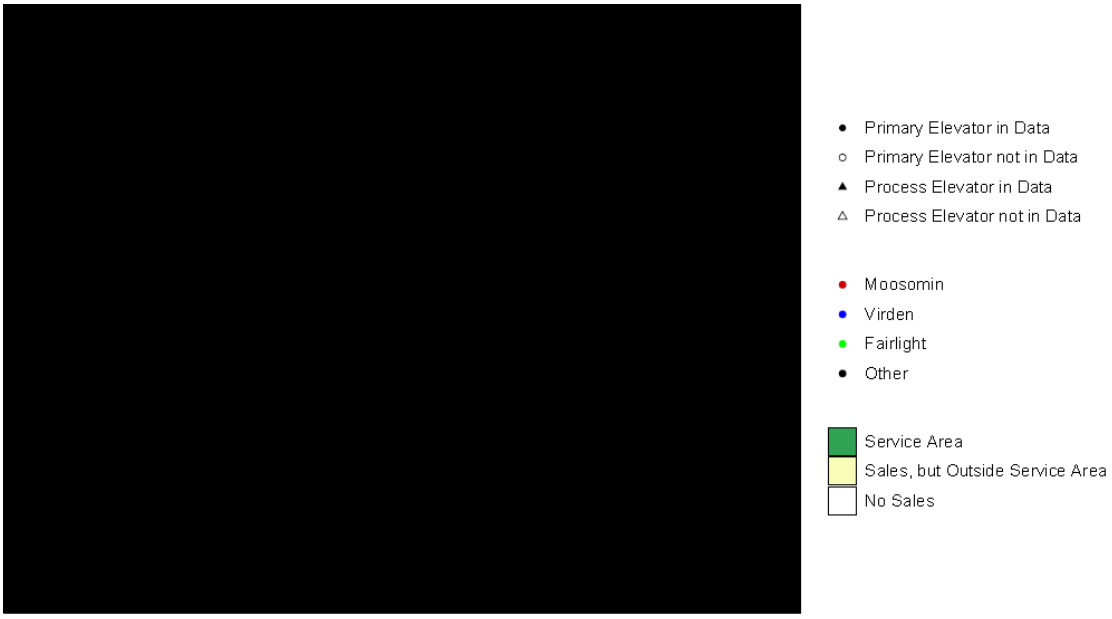


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to canola transactions during March 2018–February 2019. Nexera and non-GMO canola are excluded. The service area represents the closest CCSs to Bloom that collectively form 90% of the total net quantity bought by Bloom. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data. The Bloom elevator is more than 200 km from Moosomin and Virden and therefore is not shown on this map.

EXHIBIT 28

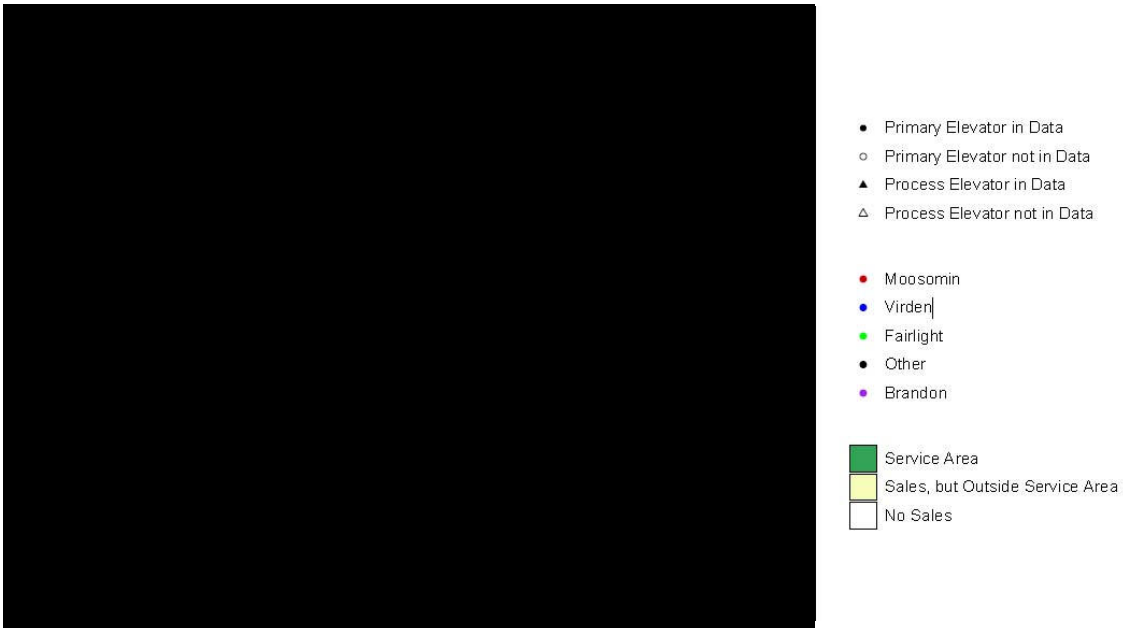
90% wheat service area for the Bloom elevator



Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to CWRS wheat transactions during August 2018–July 2019. The service area represents the closest CCSs to Bloom that collectively form 90% of the total net quantity bought by Bloom. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data. The Bloom elevator is more than 200 km from Moosomin and Virden and therefore is not shown on this map.

EXHIBIT 29
90% canola service area for the Brandon elevator

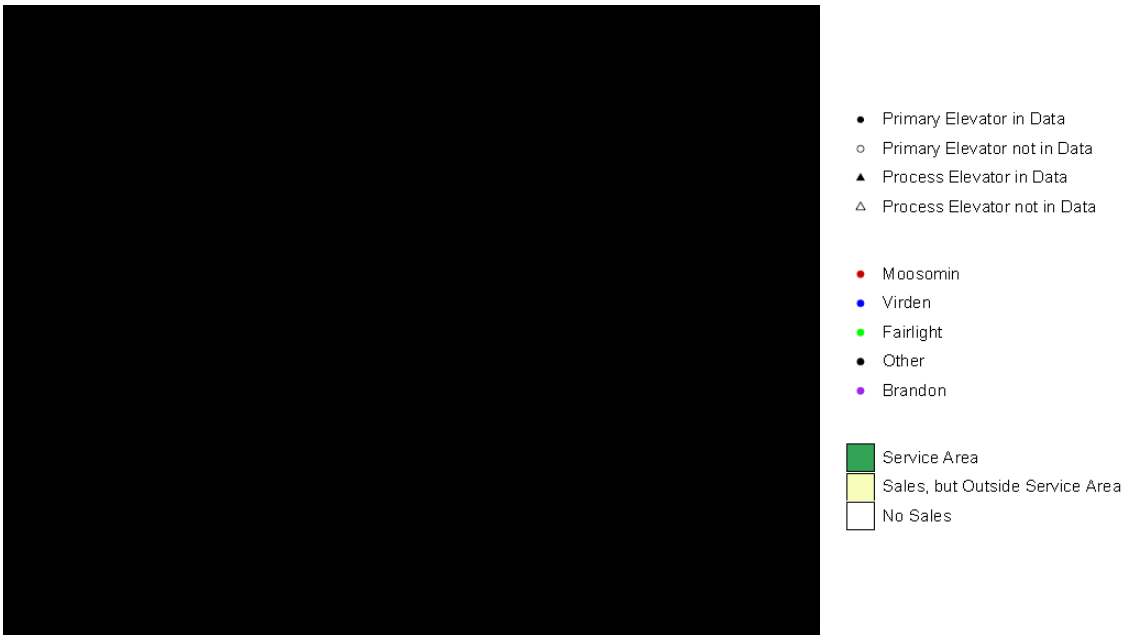


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to canola transactions during March 2018–February 2019. Nexera and non-GMO canola are excluded. The service area represents the closest CCSs to Brandon that collectively form 90% of the total net quantity bought by Brandon. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 30

90% wheat service area for the Brandon elevator

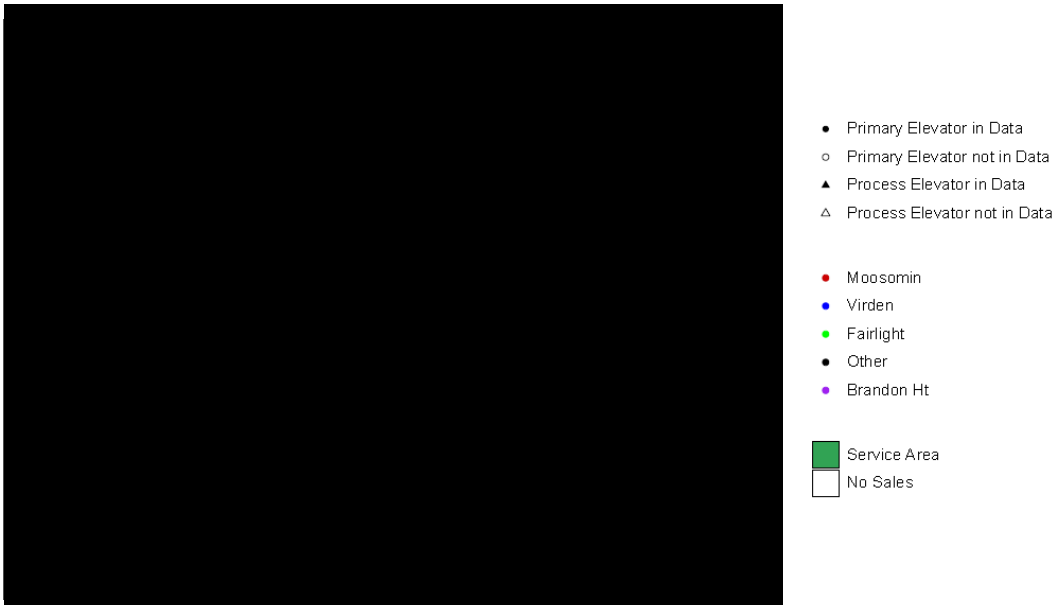


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to CWRS wheat transactions during August 2018–July 2019. The service area represents the closest CCSs to Brandon that collectively form 90% of the total net quantity bought by Brandon. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 31

90% canola service area for the Brandon HT elevator

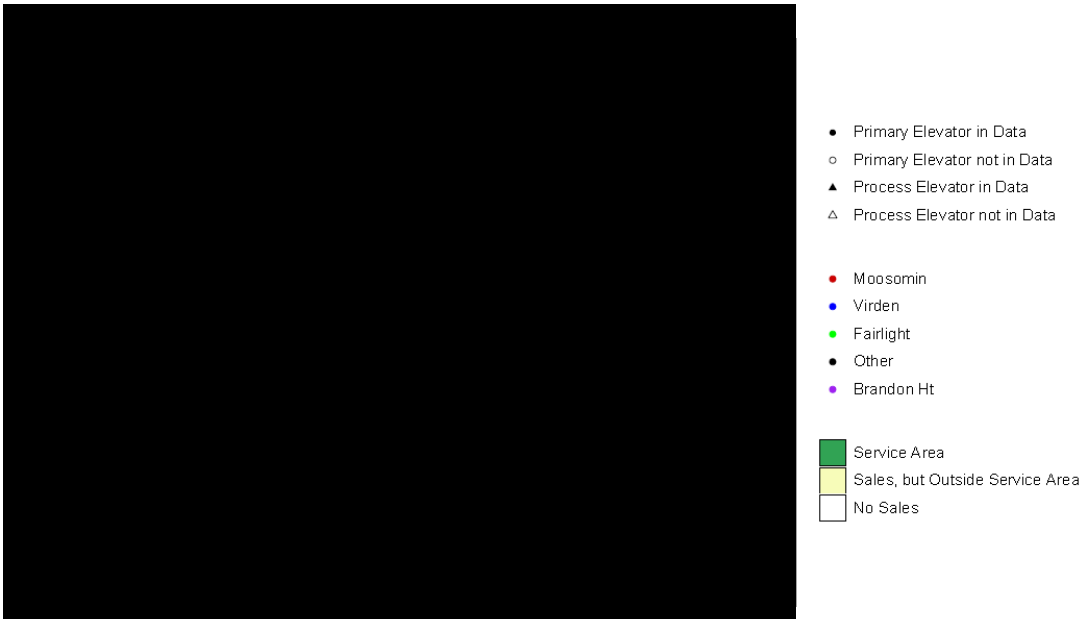


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to canola transactions during March 2018–February 2019. Nexera and non-GMO canola are excluded. The service area represents the closest CCSs to Brandon HT that collectively form 90% of the total net quantity bought by Brandon HT. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 32

90% wheat service area for the Brandon HT elevator

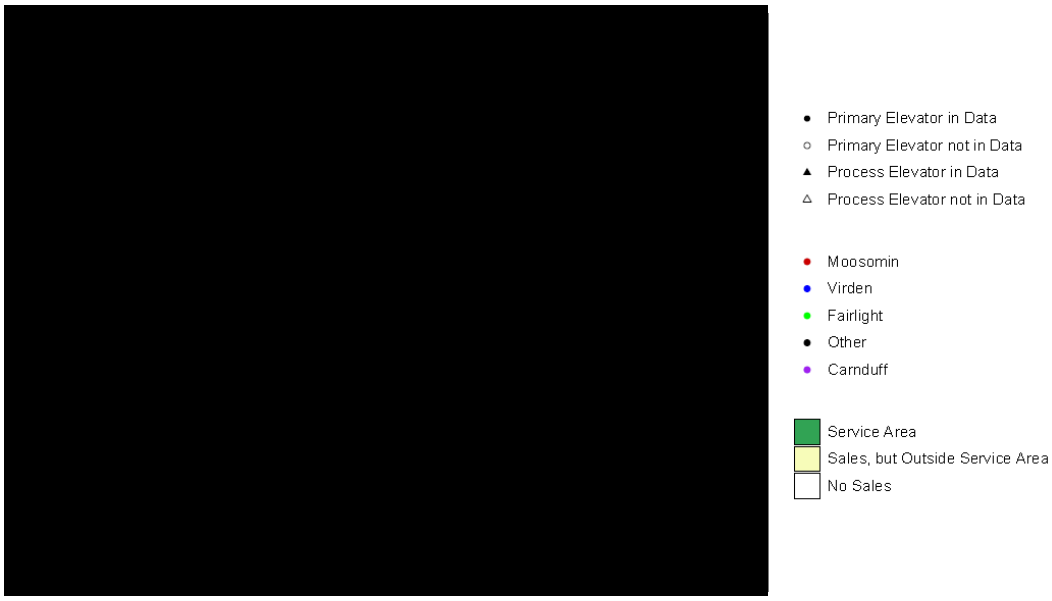


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to CWRS wheat transactions during August 2018–July 2019. The service area represents the closest CCSs to Brandon HT that collectively form 90% of the total net quantity bought by Brandon HT. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 33

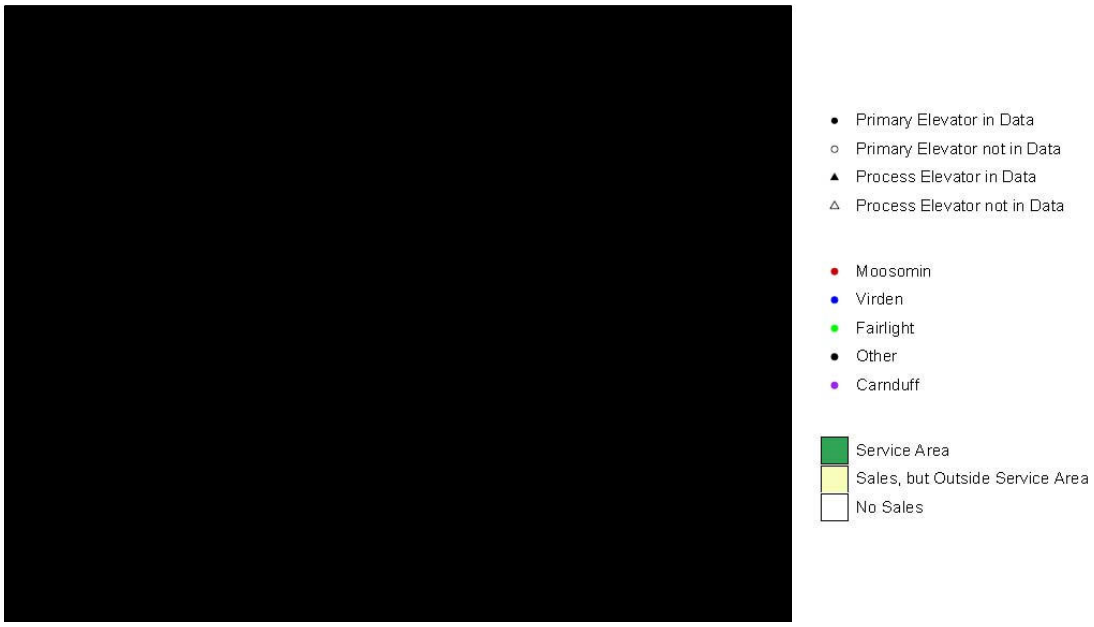
90% canola service area for the Carnduff elevator



Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to canola transactions during March 2018–February 2019. Nexera and non-GMO canola are excluded. The service area represents the closest CCSs to Carnduff that collectively form 90% of the total net quantity bought by Carnduff. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 34
90% wheat service area for the Carnduff elevator

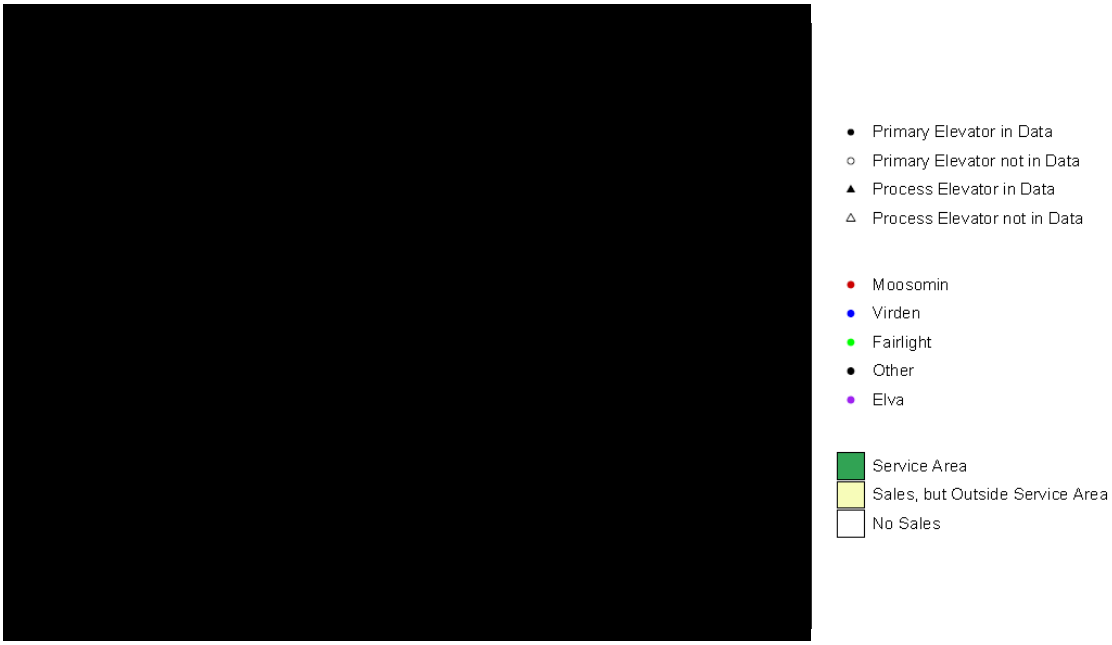


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to CWRS wheat transactions during August 2018–July 2019. The service area represents the closest CCSs to Carnduff that collectively form 90% of the total net quantity bought by Carnduff. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 35

90% canola service area for the Elva elevator

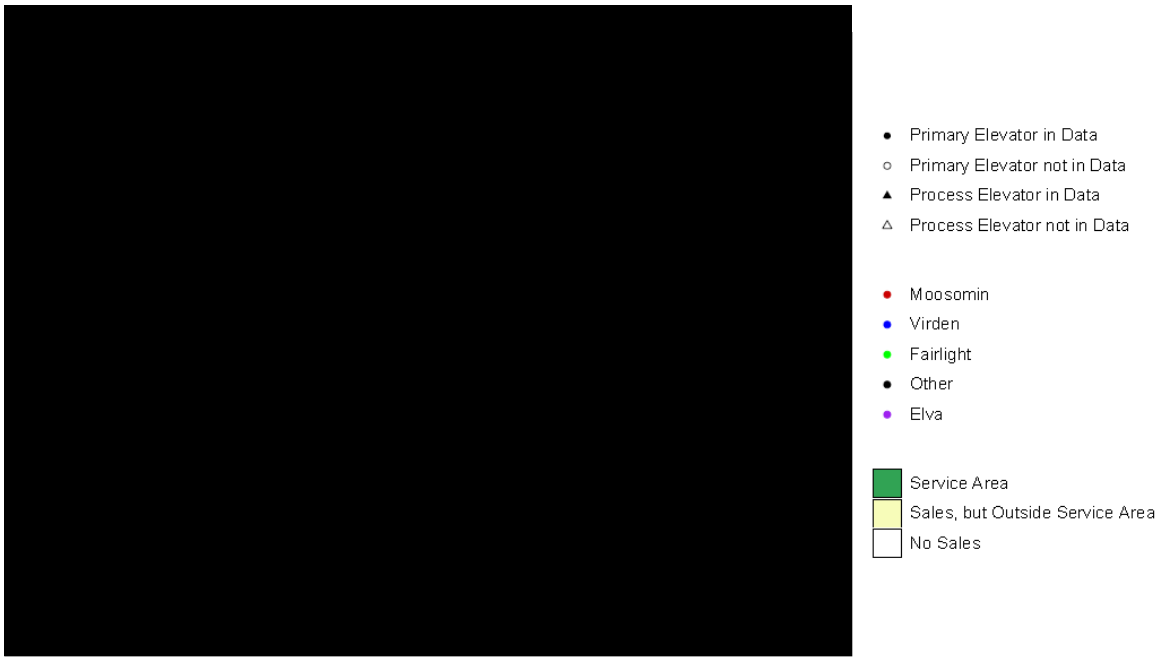


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to canola transactions during March 2018–February 2019. Nexera and non-GMO canola are excluded. The service area represents the closest CCSs to Elva that collectively form 90% of the total net quantity bought by Elva. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 36

90% wheat service area for the Elva elevator

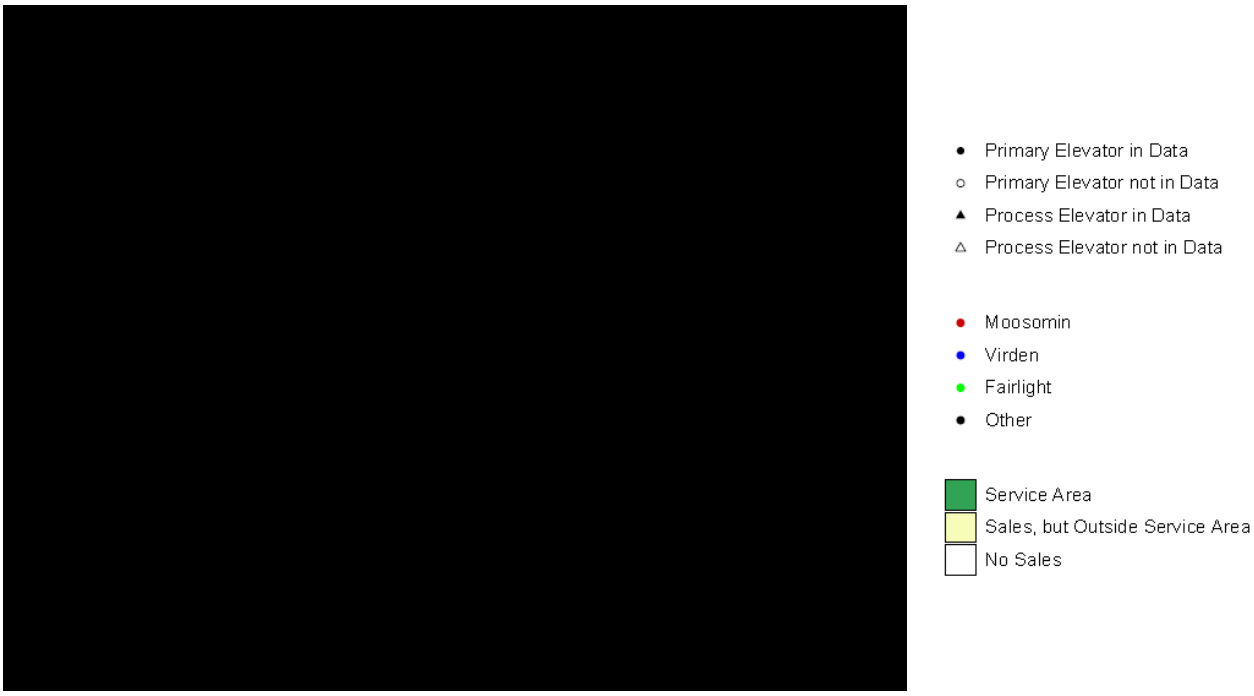


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to CWRS wheat transactions during August 2018–July 2019. The service area represents the closest CCSs to Elva that collectively form 90% of the total net quantity bought by Elva. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 37

90% canola service area for the Fairlight elevator

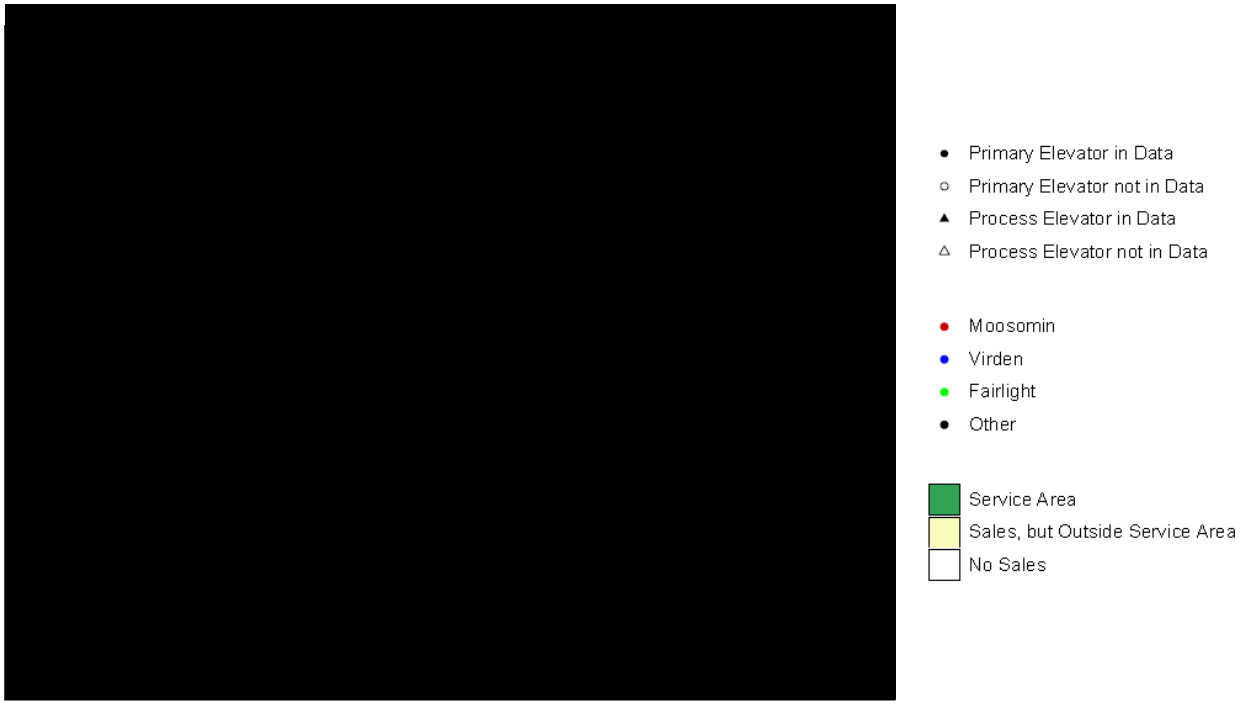


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to canola transactions during March 2018–February 2019. Nexera and non-GMO canola are excluded. The service area represents the closest CCSs to Fairlight that collectively form 90% of the total net quantity bought by Fairlight. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 38

90% wheat service area for the Fairlight elevator

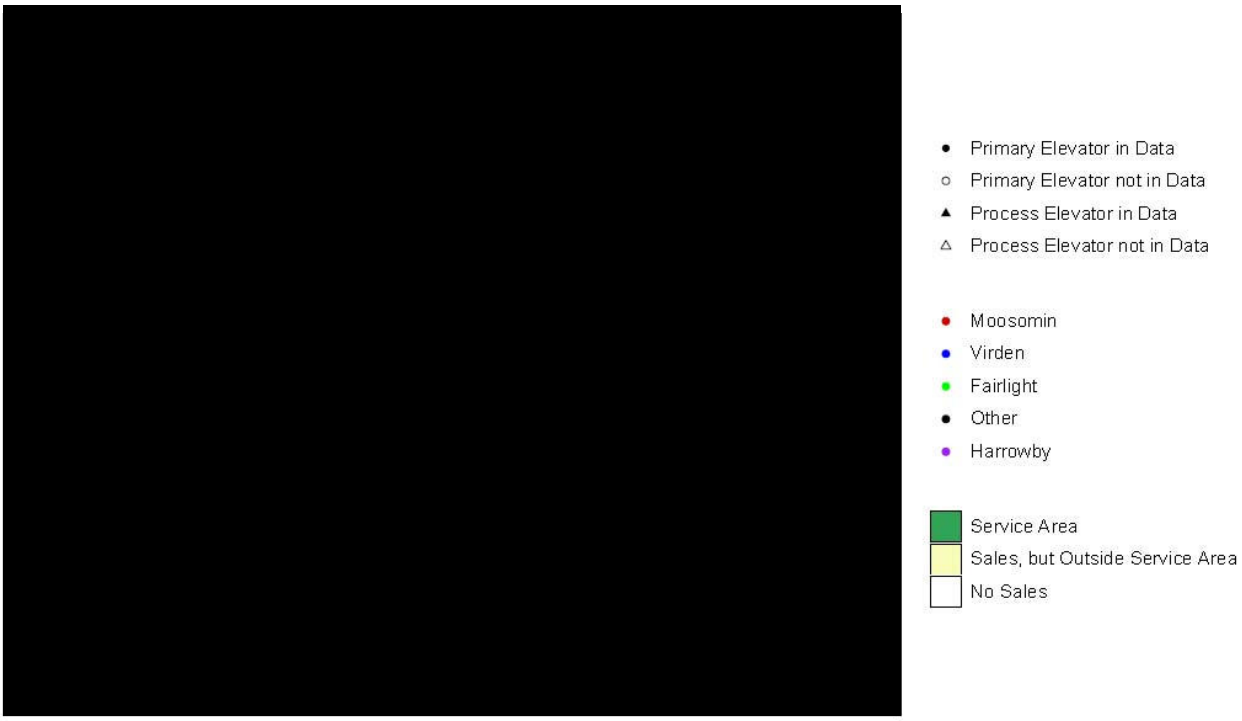


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to CWRS wheat transactions during August 2018–July 2019. The service area represents the closest CCSs to Fairlight that collectively form 90% of the total net quantity bought by Fairlight. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 39

90% canola service area for the Harrowby elevator (crusher)

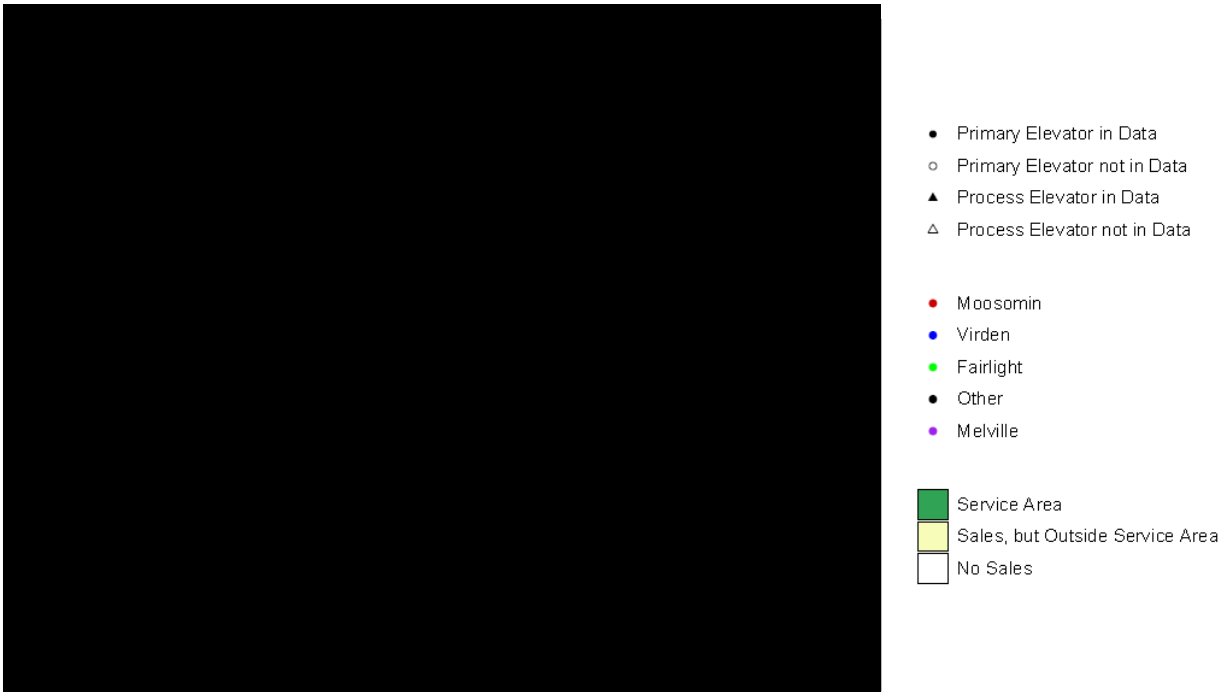


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to canola transactions during March 2018–February 2019. Nexera and non-GMO canola are excluded. The service area represents the closest CCSs to Harrowby that collectively form 90% of the total net quantity bought by Harrowby. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 40

90% canola service area for the Melville elevator

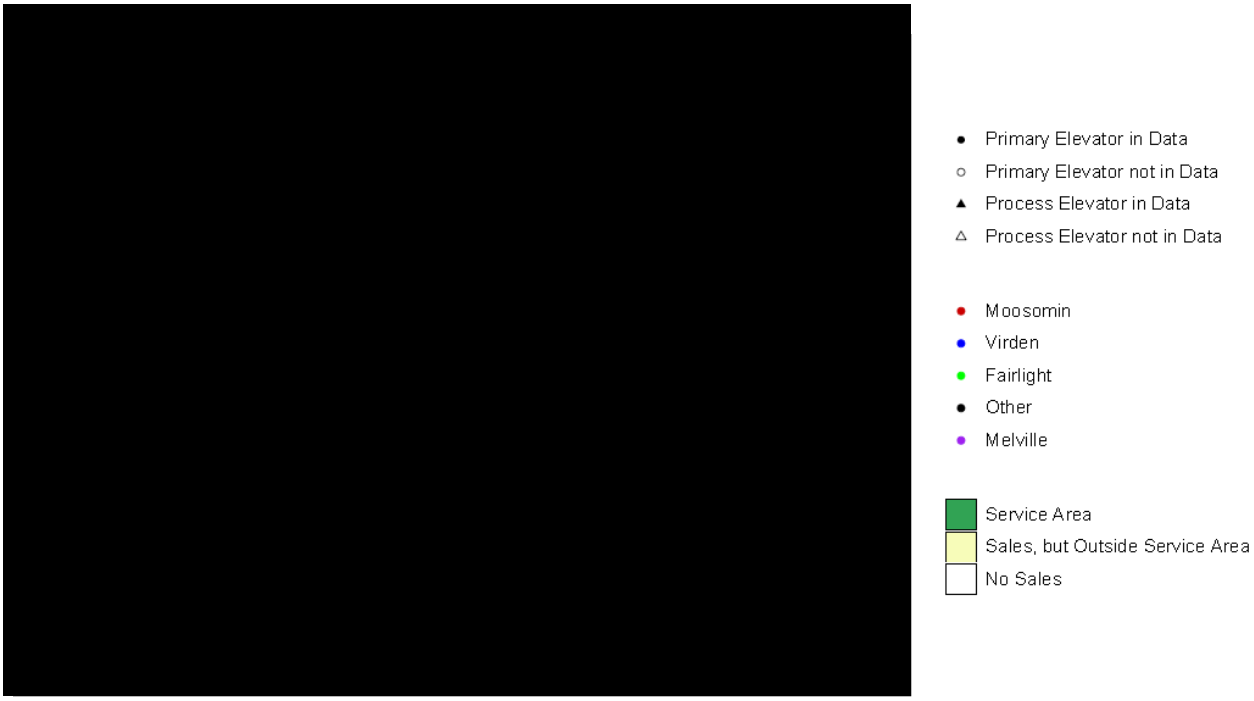


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to canola transactions during March 2018–February 2019. Nexera and non-GMO canola are excluded. The service area represents the closest CCSs to Melville that collectively form 90% of the total net quantity bought by Melville. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 41

90% wheat service area for the Melville elevator

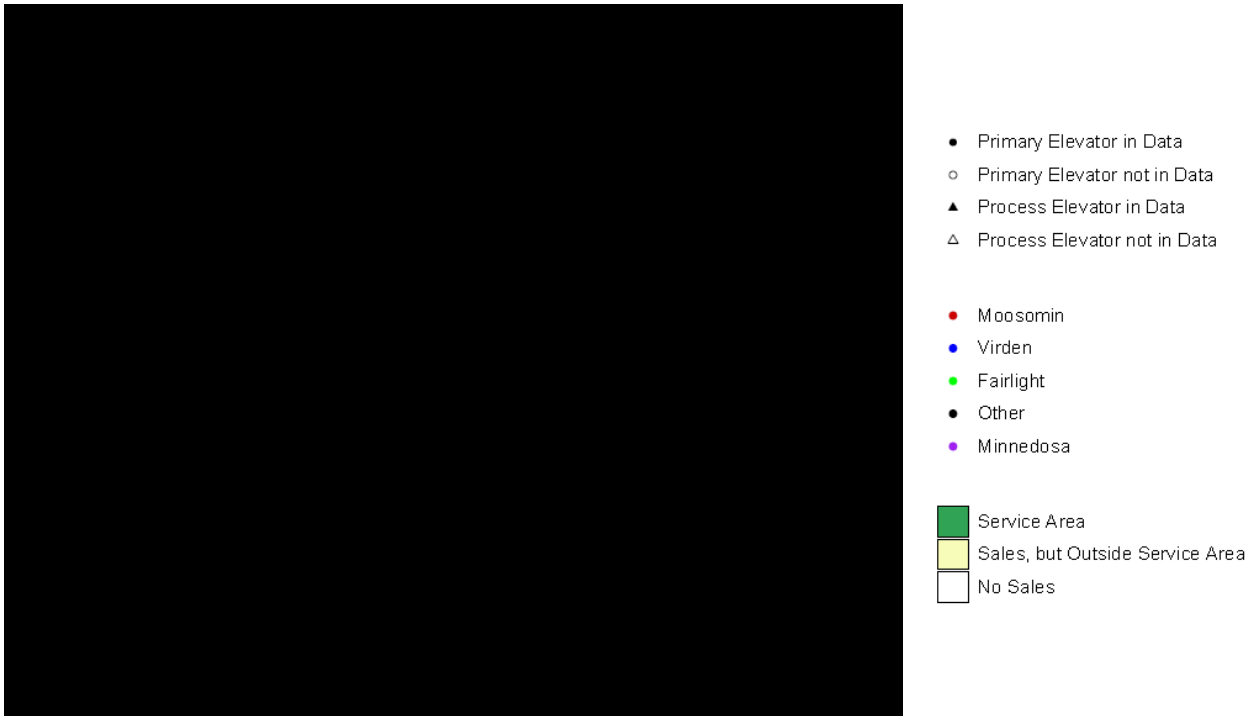


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to CWRS wheat transactions during August 2018–July 2019. The service area represents the closest CCSs to Melville that collectively form 90% of the total net quantity bought by Melville. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 42

90% canola service area for the Minnedosa elevator

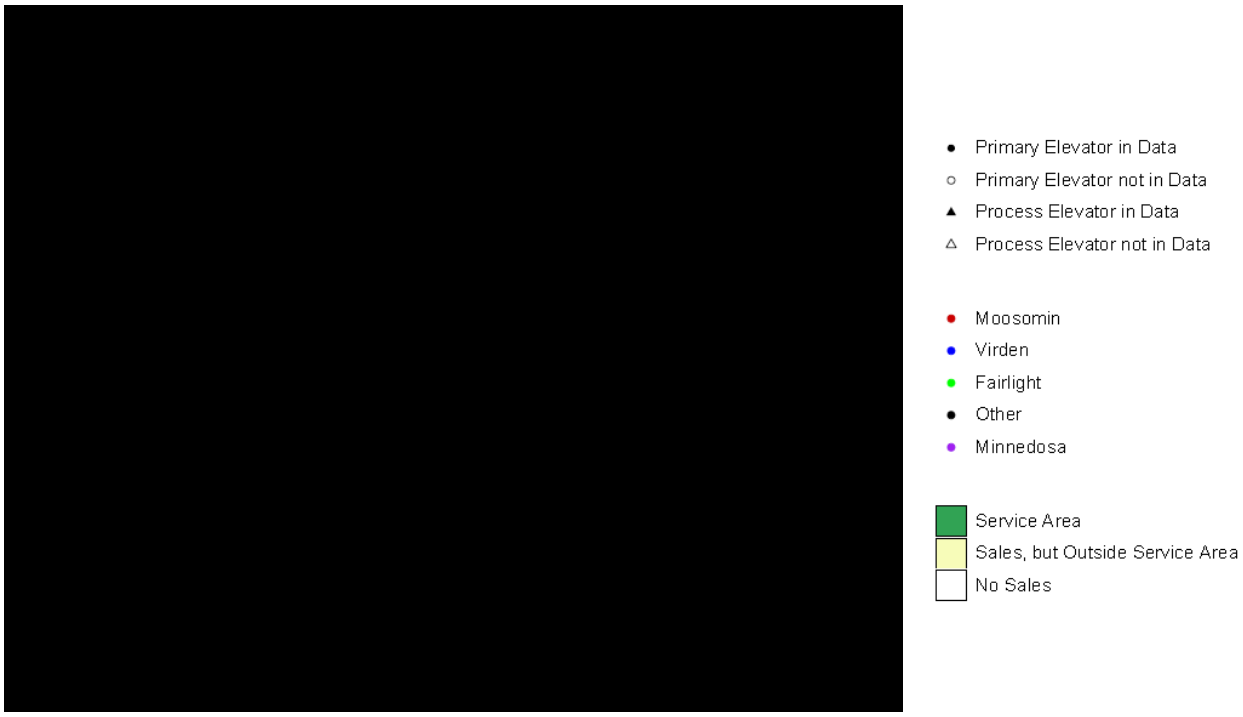


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to canola transactions during March 2018–February 2019. Nexera and non-GMO canola are excluded. The service area represents the closest CCSs to Minnedosa that collectively form 90% of the total net quantity bought by Minnedosa. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 43

90% wheat service area for the Minnedosa elevator

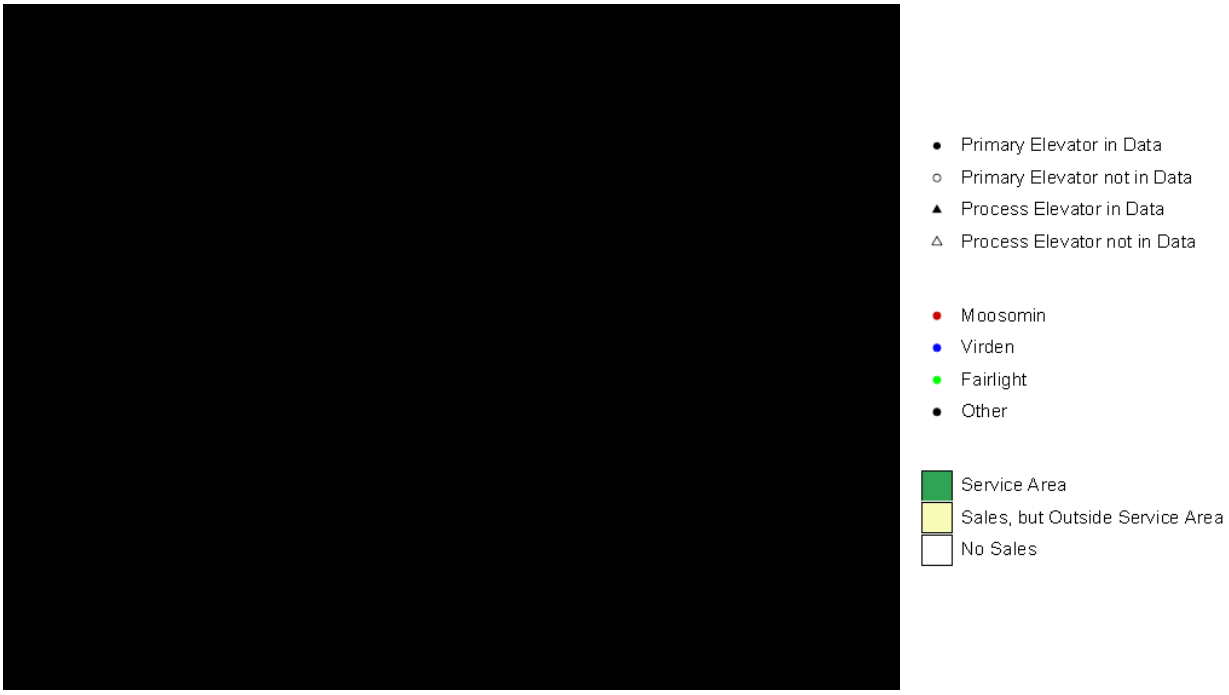


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to CWRS wheat transactions during August 2018–July 2019. The service area represents the closest CCSs to Minnedosa that collectively form 90% of the total net quantity bought by Minnedosa. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 44

90% canola service area for the Moosomin elevator

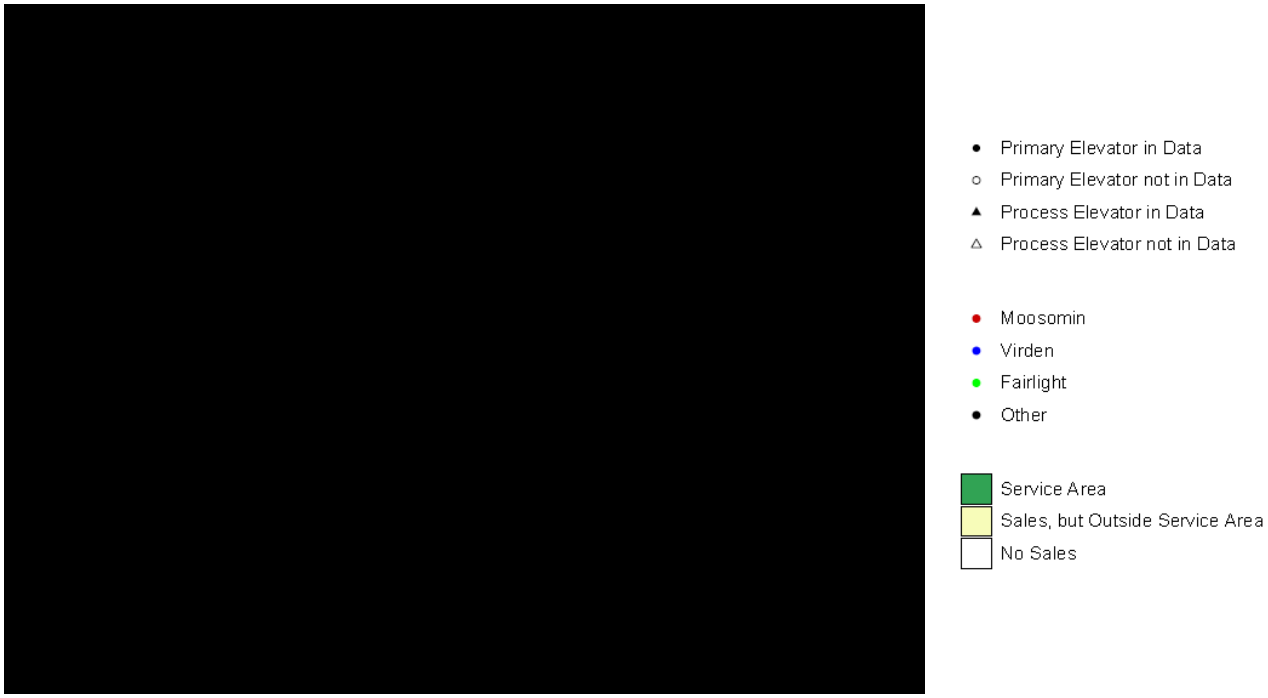


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to canola transactions during March 2018–February 2019. Nexera and non-GMO canola are excluded. The service area represents the closest CCSs to Moosomin that collectively form 90% of the total net quantity bought by Moosomin. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 45

90% wheat service area for the Moosomin elevator

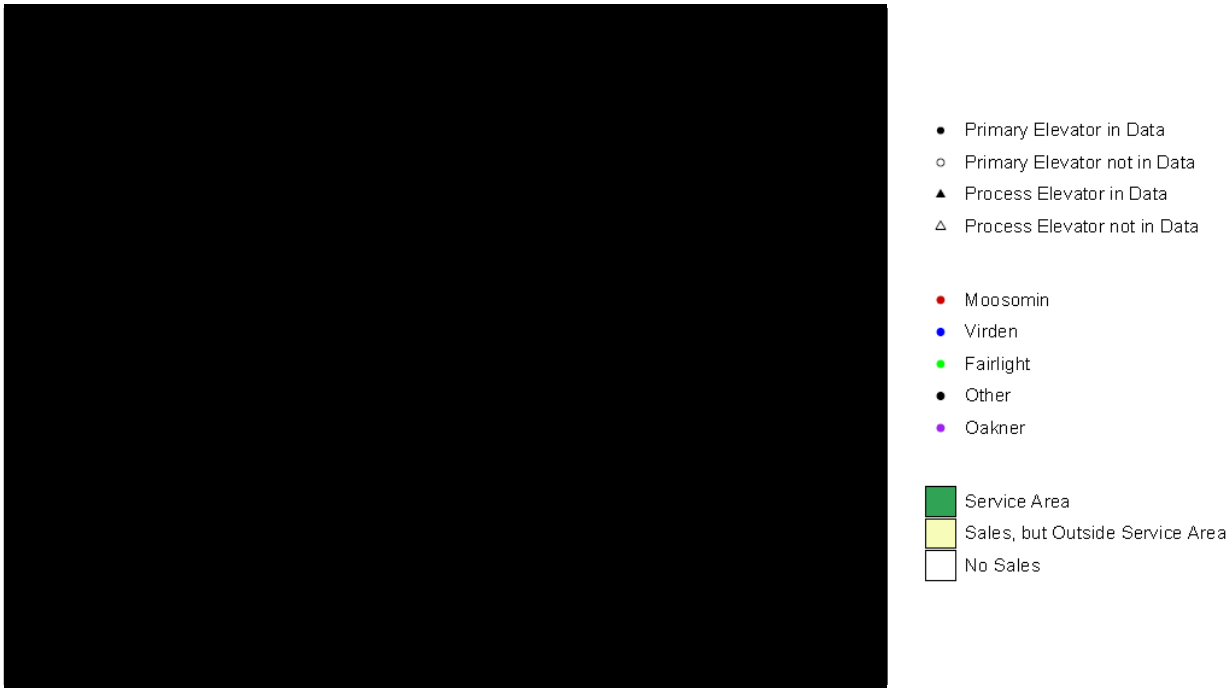


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to CWRS wheat transactions during August 2018–July 2019. The service area represents the closest CCSs to Moosomin that collectively form 90% of the total net quantity bought by Moosomin. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 46

90% canola service area for the Oakner elevator

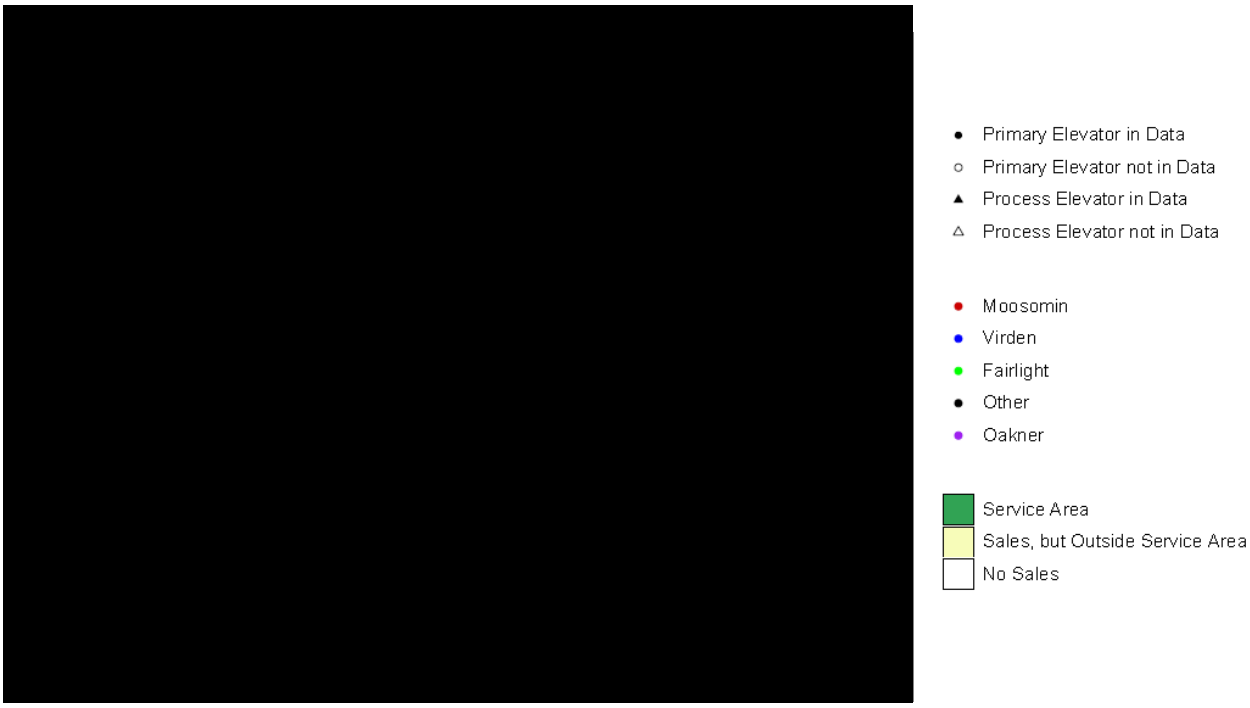


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to canola transactions during March 2018–February 2019. Nexera and non-GMO canola are excluded. The service area represents the closest CCSs to Oakner that collectively form 90% of the total net quantity bought by Oakner. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 47

90% wheat service area for the Oakner elevator

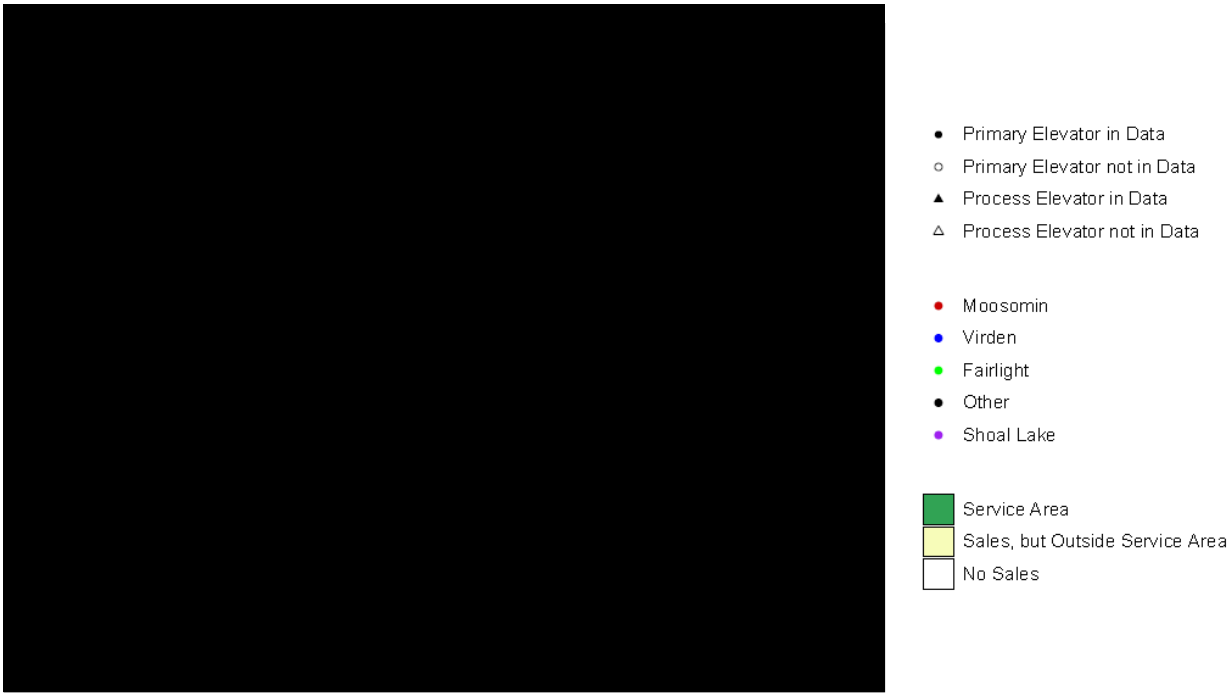


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to CWRS wheat transactions during August 2018–July 2019. The service area represents the closest CCSs to Oakner that collectively form 90% of the total net quantity bought by Oakner. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 48

90% canola service area for the Shoal Lake elevator

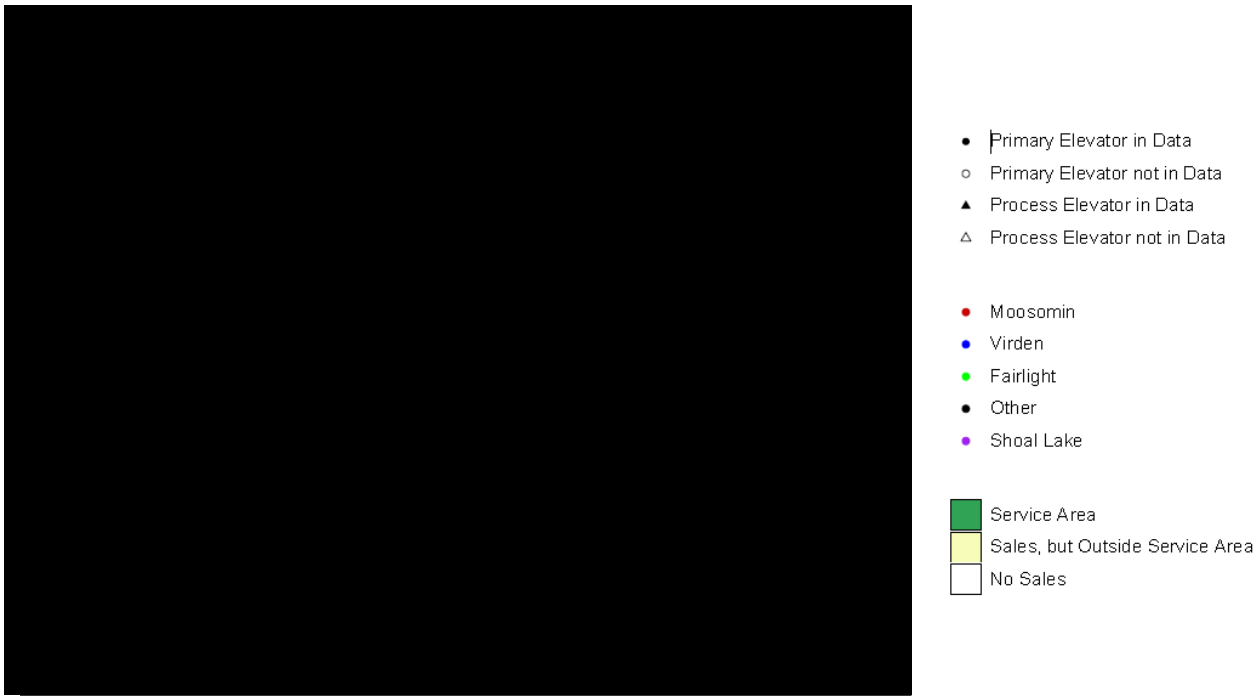


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to canola transactions during March 2018–February 2019. Nexera and non-GMO canola are excluded. The service area represents the closest CCSs to Shoal Lake that collectively form 90% of the total net quantity bought by Shoal Lake. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 49

90% wheat service area for the Shoal Lake elevator

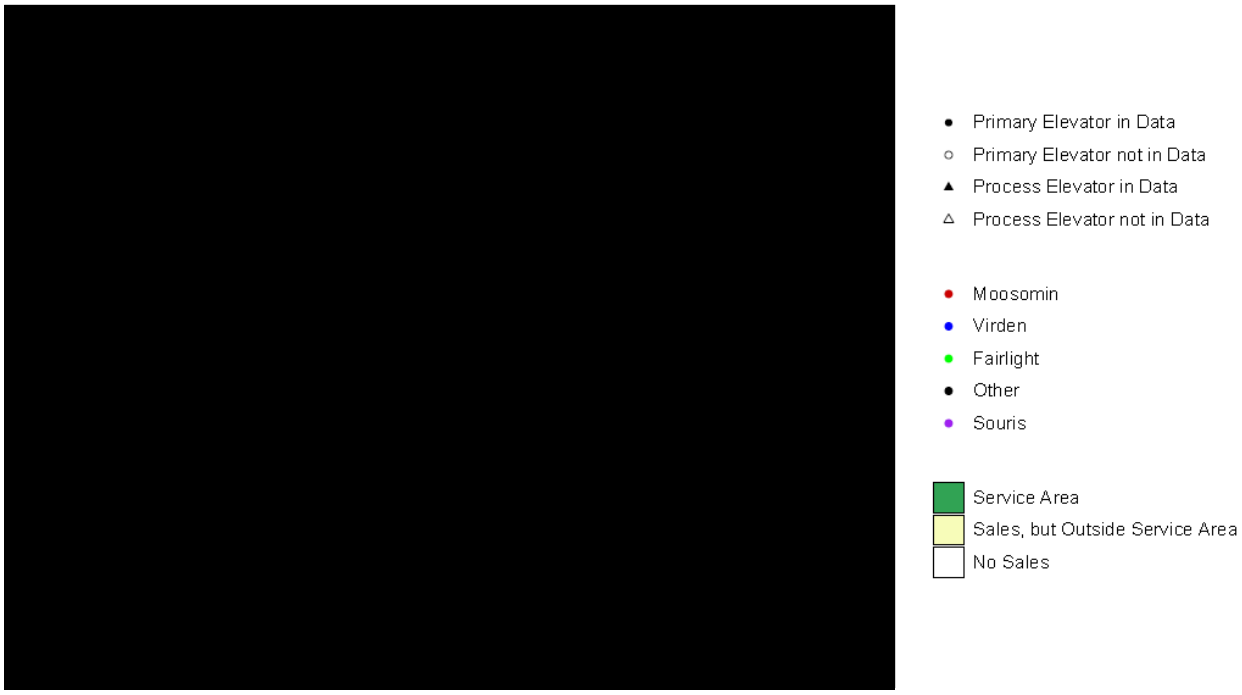


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to CWRS wheat transactions during August 2018–July 2019. The service area represents the closest CCSs to Shoal Lake that collectively form 90% of the total net quantity bought by Shoal Lake. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 50

90% canola service area for the Souris elevator

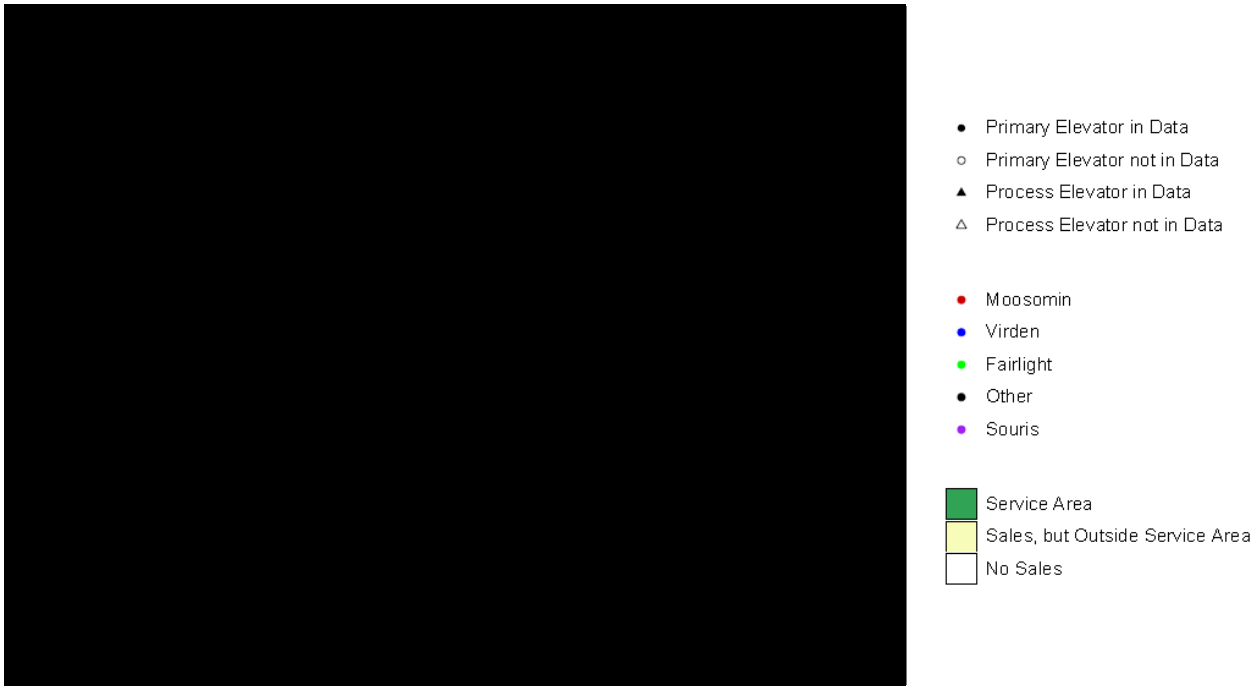


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to canola transactions during March 2018–February 2019. Nexera and non-GMO canola are excluded. The service area represents the closest CCSs to Souris that collectively form 90% of the total net quantity bought by Souris. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 51

90% wheat service area for the Souris elevator



Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to CWRS wheat transactions during August 2018–July 2019. The service area represents the closest CCSs to Souris that collectively form 90% of the total net quantity bought by Souris. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 52

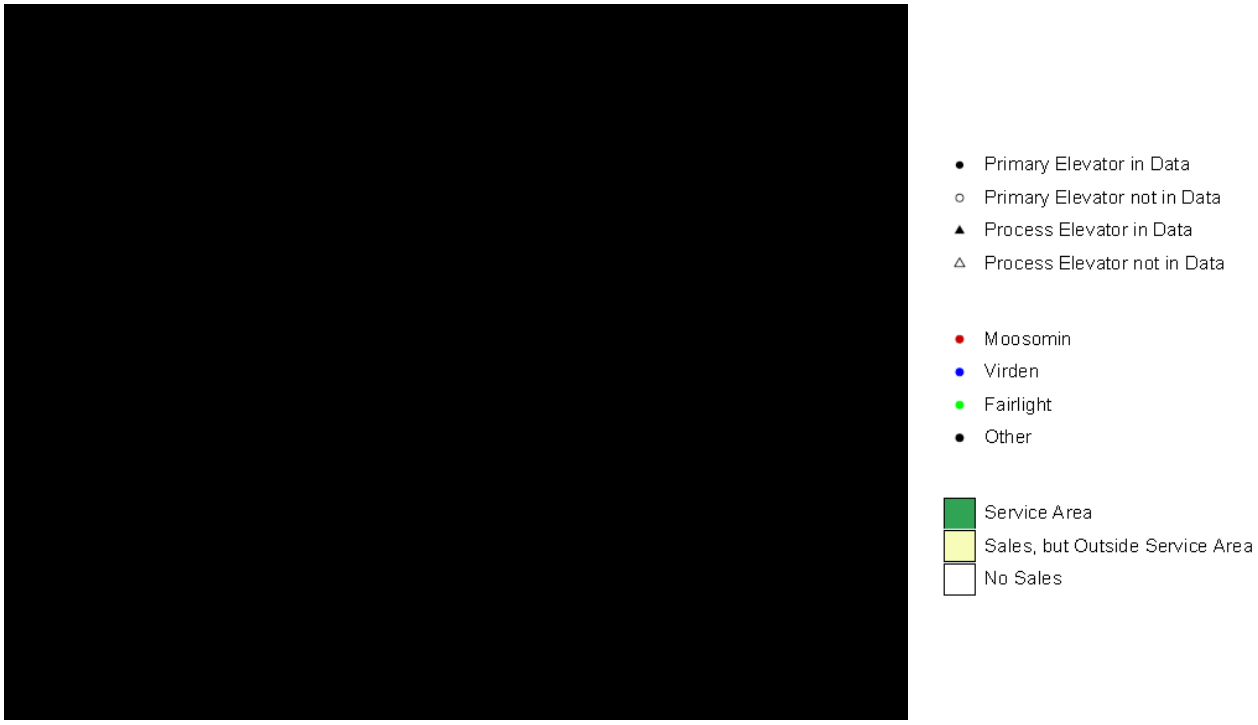
90% canola service area for the Velva elevator (crusher)

Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to canola transactions during March 2018–February 2019. Nexera and non-GMO canola are excluded. The service area represents the closest CCSs to Velva that collectively form 90% of the total net quantity bought by Velva. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data. The Velva elevator is more than 200 km from Moosomin and Virden and therefore is not shown on this map.

EXHIBIT 53

90% canola service area for the Virden elevator

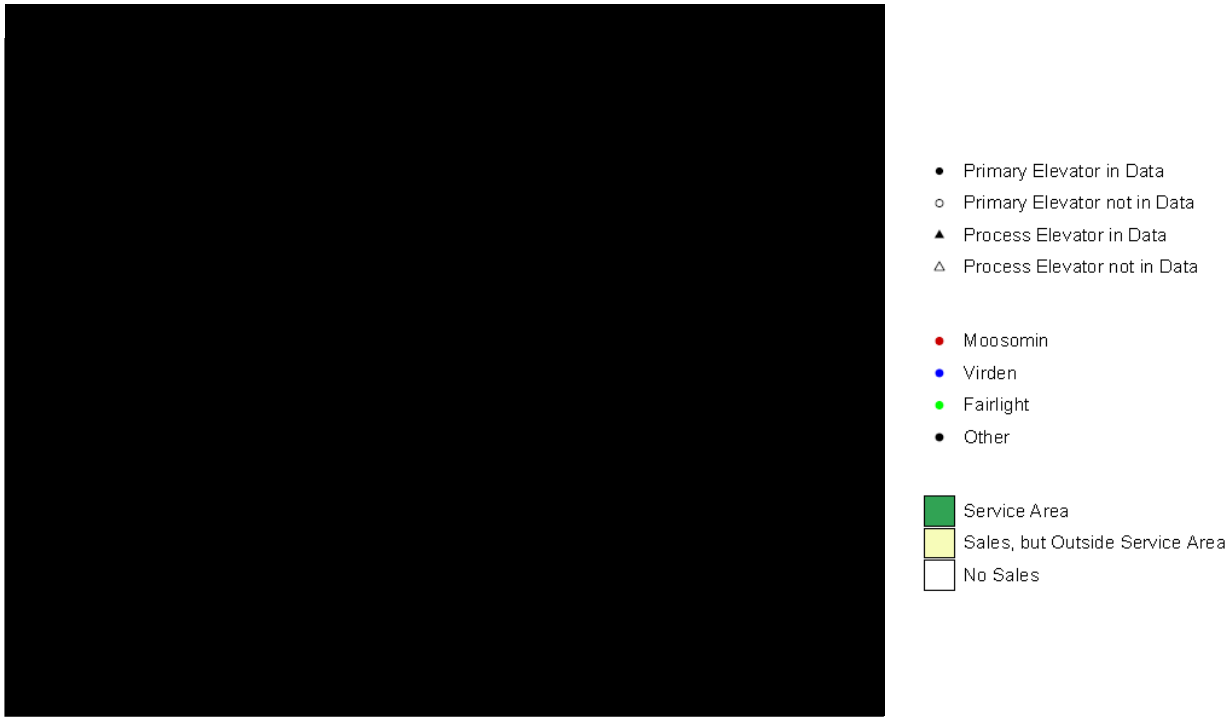


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to canola transactions during March 2018–February 2019. Nexera and non-GMO canola are excluded. The service area represents the closest CCSs to Virden that collectively form 90% of the total net quantity bought by Virden. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 54

90% wheat service area for the Virden elevator

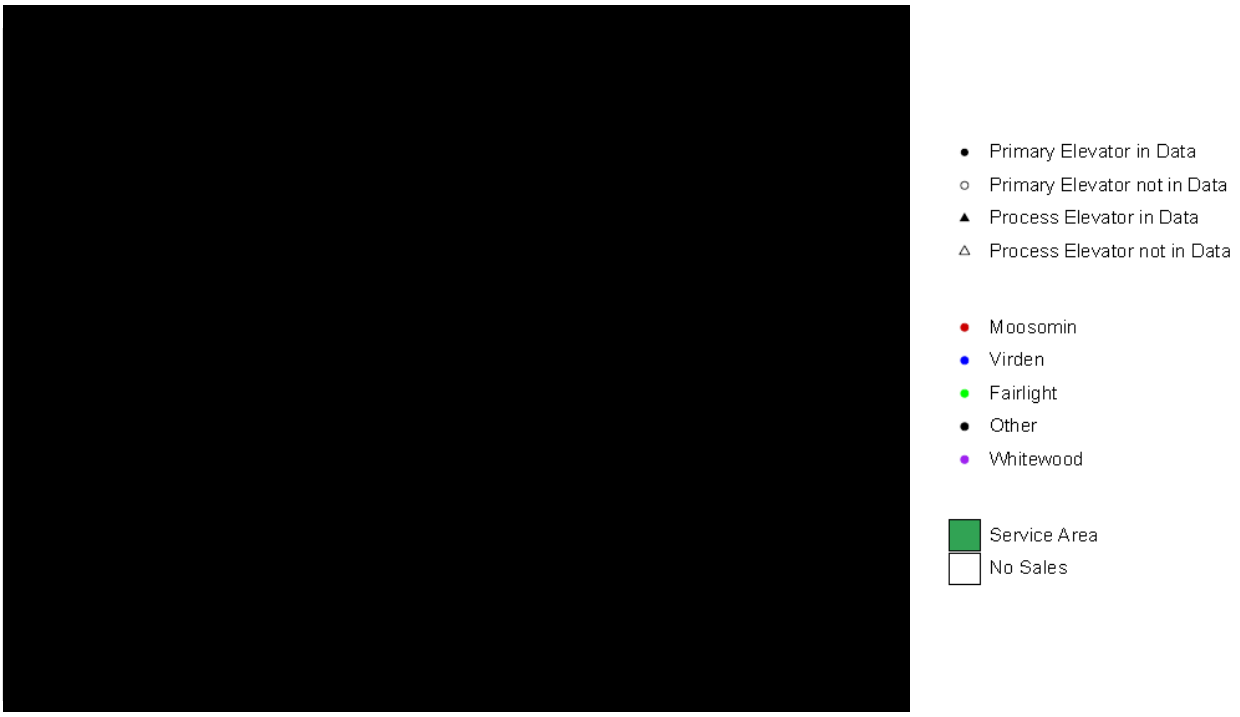


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to CWRS wheat transactions during August 2018–July 2019. The service area represents the closest CCSs to Virden that collectively form 90% of the total net quantity bought by Virden. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 55

90% canola service area for the Whitewood elevator

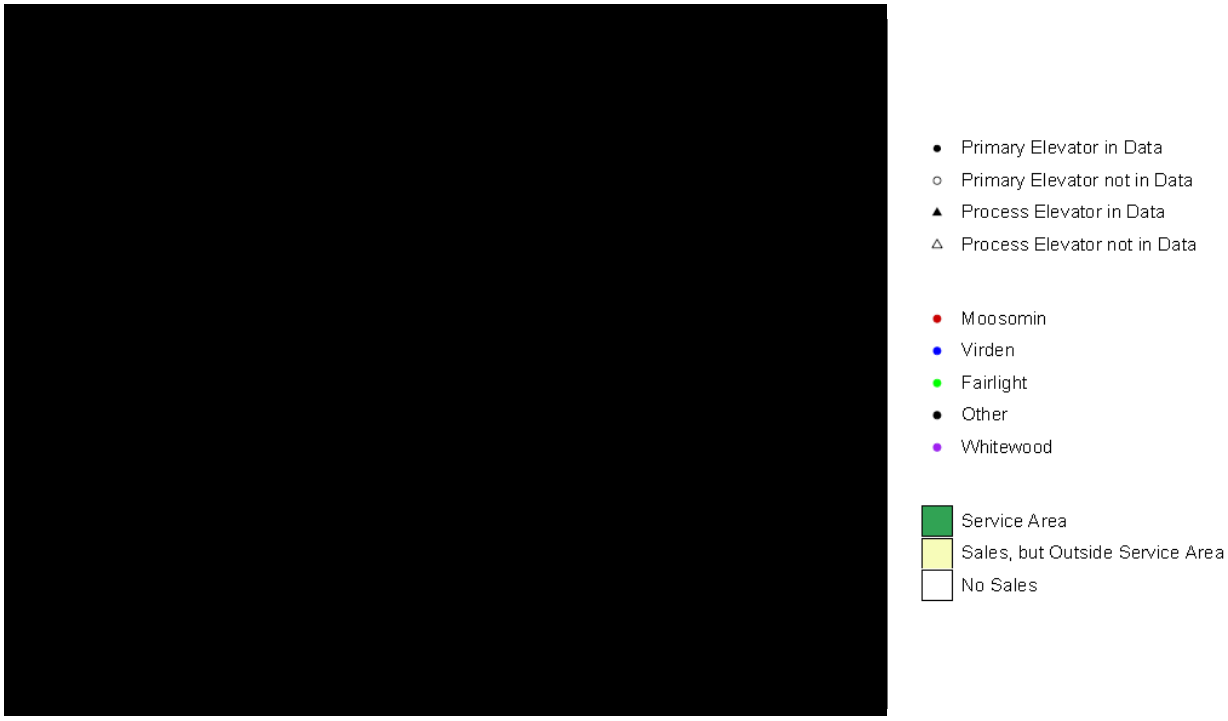


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to canola transactions during March 2018–February 2019. Nexera and non-GMO canola are excluded. The service area represents the closest CCSs to Whitewood that collectively form 90% of the total net quantity bought by Whitewood. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 56

90% wheat service area for the Whitewood elevator

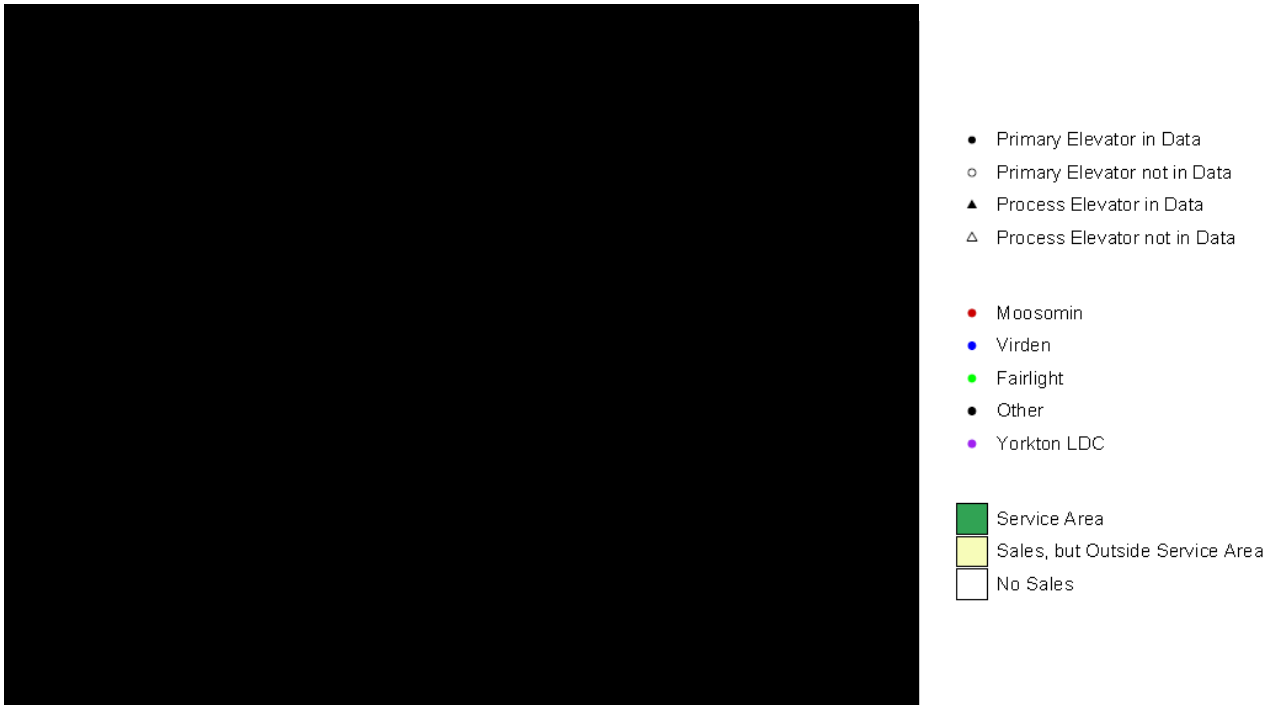


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to CWRS wheat transactions during August 2018–July 2019. The service area represents the closest CCSs to Whitewood that collectively form 90% of the total net quantity bought by Whitewood. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 57

90% canola service area for the Yorkton LDC elevator (crusher)

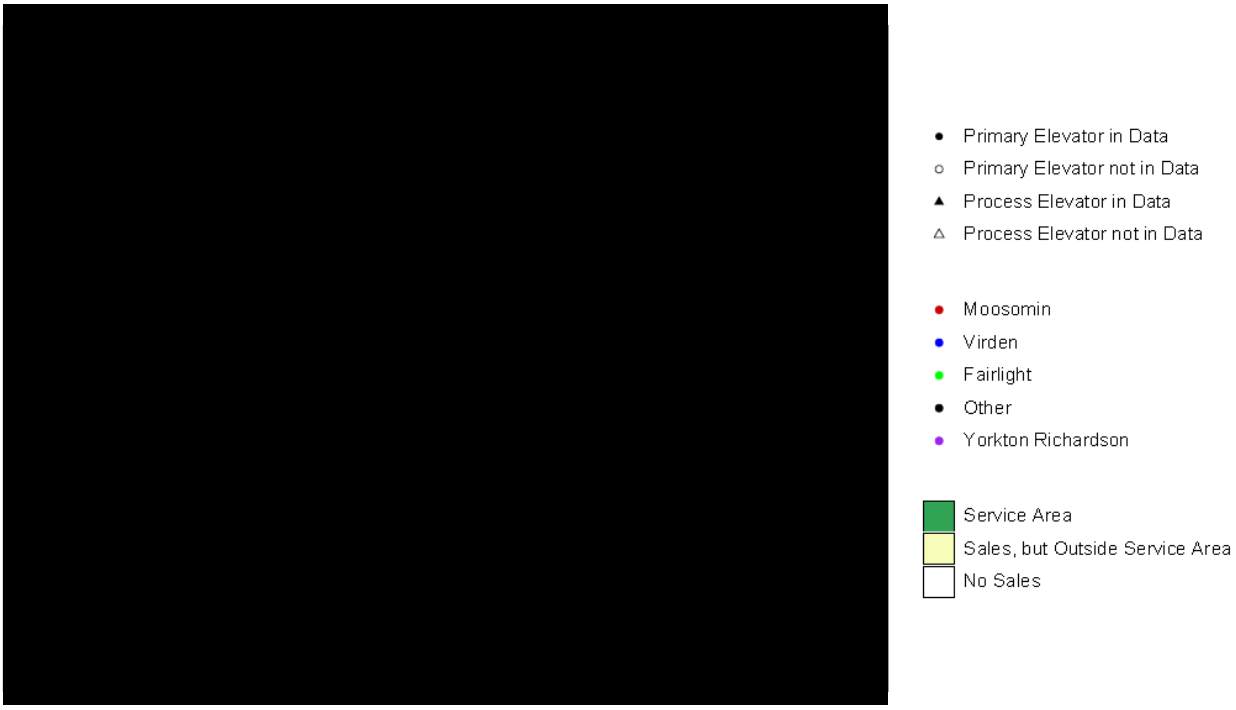


Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to canola transactions during March 2018–February 2019. Nexera and non-GMO canola are excluded. The service area represents the closest CCSs to Yorkton LDC that collectively form 90% of the total net quantity bought by Yorkton LDC. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

EXHIBIT 58

90% canola service area for the Yorkton Richardson elevator (crusher)



Source: LDC Transaction Data; P&H Transaction Data; Cargill Transaction Data; Richardson Transaction Data; Viterra Transaction Data; Bunge Transaction Data; ADM Transaction Data; G3 Transaction Data; Grain Elevators in Canada Data; 2016 Census Program CCS Boundary Files

Note: Analysis limited to canola transactions during March 2018–February 2019. Nexera and non-GMO canola are excluded. The service area represents the closest CCSs to Richardson that collectively form 90% of the total net quantity bought by Richardson. Elevators shown are primary elevators and process elevators, also known as crushers. The size of each elevator is proportional to elevator capacity. Elevators and CCSs within 200 km from Virden or Moosomin are shown. The hollow circles represent primary elevators that are not included in the data, and the hollow triangles represent the process elevators not included in the data.

Appendix B

Nathan H. Miller

Georgetown University
McDonough School of Business
37th and O Streets, NW
Washington, DC 20057

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nhm27@georgetown.edu
www.nathanhmiller.org
Updated August 2020

Positions

Georgetown University
- Saleh Romeih Associate Professor, 2019-present, McDonough School of Business
- Affiliated Professor, 2019-present, Economics Department
- Senior Policy Scholar, Center for Business and Public Policy, 2017-present
- Associate Professor, 2017-2019, McDonough School of Business
- Assistant Professor, 2013-2017, McDonough School of Business

Toulouse School of Economics
- Visiting Professor, 2019-2020

U.S. Department of Justice, Antitrust Division
- Staff Economist, 2008-2013

Degrees

Ph.D., Economics, University of California at Berkeley, 2008.
B.A., Economics and History, University of Virginia, 2000.

Refereed Publications

"Finding Mr. Schumpeter: Technology Adoption in the Cement Industry" (with Jeffrey Macher and Matthew Osborne). *RAND Journal of Economics*, accepted.

"Forward Contracts, Market Structure, and the Welfare Effects of Mergers" (with Joseph Podwol). *Journal of Industrial Economics*, Vol. 68, No. 2, 364-407 (2020).

"Understanding the Price Effects of the MillerCoors Joint Venture" (with Matthew Weinberg). *Econometrica*, Vol. 85, No. 6, 1763-1791 (2017).

"Pass-Through in a Concentrated Industry: Empirical Evidence and Regulatory Implications" (with Matthew Osborne and Gloria Sheu). *RAND Journal of Economics*, Vol. 48, No. 1, 69-93 (2017).

"Upward Pricing Pressure as a Predictor of Merger Price Effects" (with Marc Remer, Conor Ryan and Gloria Sheu). *International Journal of Industrial Organization*, Vol. 52, 216-247 (2017).

"Pass-Through and the Prediction of Merger Price Effects" (with Marc Remer, Conor Ryan and Gloria Sheu). *Journal of Industrial Economics*, Vol. 64, December, 684-709 (2016).

"Spatial Differentiation and Price Discrimination in the Cement Industry: Evidence from a Structural Model" (with Matthew Osborne), *RAND Journal of Economics*, Vol. 45, No. 2, 221-247 (2014, lead article).

"Modeling the Effects of Mergers in Procurement," *International Journal of Industrial Organization*, Vol. 37, November, 201-208 (2014).

"Automakers' Short-Run Responses to Changing Gasoline Prices" (with Ashley Langer), *Review of Economics and Statistics*, Vol. 95, No. 4, 1198-1211 (2013).

"Why Do Borrowers Pledge Collateral? New Empirical Evidence on the Role of Asymmetric Information" (with Allen Berger, Marco Espinosa-Vega, and Scott Frame), *Journal of Financial Intermediation*, Vol. 20, No. 1, 55-70 (2011).

"Strategic Leniency and Cartel Enforcement," *American Economic Review*, Vol. 99, No. 3, 750-768 (2009).

"Debt Maturity, Risk, and Asymmetric Information" (with Allen Berger, Marco Espinosa-Vega, and Scott Frame), *Journal of Finance*, Vol. 60, No. 6, 2895-2923 (2005).

"Does Functional Form Follow Organizational Form? Evidence from the Lending Practices of Large and Small Banks" (with Allen Berger, Mitchell Petersen, Raghuram Rajan, and Jeremy Stein), *Journal of Financial Economics*, Vol. 76, No. 2, 237-269 (2005, lead article).

"Credit Scoring and the Availability, Price, and Risk of Small Business Credit" (with Allen Berger and Scott Frame), *Journal of Money, Banking, and Credit*, Vol 37, No. 2, 191-222 (2005, lead article).

Shorter Refereed Articles

"Bias in Reduced-Form Estimates of Pass-Through" (with Alexander MacKay, Marc Remer and Gloria Sheu), *Economics Letters*, Vol. 123, No. 2, 200-202 (2014).

"Consistency and Asymptotic Normality for Equilibrium Models with Partially Observed Outcome Variables" (with Matthew Osborne), *Economics Letters*, Vol. 123, No. 1, 70-74 (2014).

"Using Cost Pass-Through to Calibrate Demand" (with Marc Remer and Gloria Sheu), *Economics Letters*, Vol. 118, No. 3, 451-454 (2013).

"The Entry Incentives of Complimentary Producers: A Simple Model with Implications for Antitrust Policy" (with Juan Lleras), *Economics Letters*, Vol. 110, No. 2, 147-150 (2011).

Book Chapters and Non-Refereed Publications

"How the MillerCoors Joint Venture Changed Competition in U.S. Brewing" (with Matthew Weinberg), *Microeconomic Insights*, 2017.

"Ex Post Merger Evaluation: How Does It Help Ex Ante?" (with Daniel Hosken and Matthew Weinberg), *Journal of European Competition Law & Practice*, 2016.

"Choosing Appropriate Control Groups in Merger Evaluations" (with Aditi Mehta), in More Pros and Cons of Merger Control, Konkurrensverket 2012.

Working Papers and Research Projects

"Oligopolistic Price Leadership and Mergers: The United States Beer Industry" (with Gloria Sheu and Matthew Weinberg), 2019. Revisions requested from *American Economic Review.*

"Estimating Models of Supply and Demand: Instruments and Covariance Restrictions" (with Alexander MacKay), 2019.

"Mergers, Entry, and Consumer Welfare" (with Peter Caradonna and Gloria Sheu), 2020.

"Quantitative Methods for Evaluating the Unilateral Effects of Mergers" (with Gloria Sheu), 2020.

"Markups in the Cement Industry, 1973-2019: Scale Economies and Market Power" (with Matthew Osborne, Gloria Sheu and Gretchen Sileo), in progress.

"Modeling the Effects of Mergers in Procurement: Addendum," SSRN Working Paper, 2017.

"Cumulative Innovation and Competition Policy" (with Alexander Raskovich), EAG Discussion Paper 10-5, 2010.

"Competition when Consumers Value Firm Scope," EAG Discussion Paper 8-7, 2008.

Grants and Awards

National Science Foundation Grant, SES 1824318, $88,635, 2018-2020.
Best Paper Award, Association of Competition Economics, 2017.
Robert F. Lanzillotti Prize for Best Paper in Antitrust Economics, 2015.
Award of Distinction for work at DOJ on AT&T/T-Mobile merger, 2013.
Jerry S. Cohen Award for Antitrust Scholarship, Honorary Mention, 2009.
COMPASS Prize for Best Paper in Antitrust Economics by Graduate Students, 2007.
UC Berkeley Dean's Normative Time Fellowship, 2006-2007.
Competition Policy Center Dissertation Award, 2006.
Institute of Business and Economic Research Mini-Grant, 2006.

Invited Seminar Presentations

2008: DOJ; Duke (Fuqua); FTC; George Washington University; Johns Hopkins University; University of Iowa; University of North Carolina, Chapel Hill

2009: BEA; BLS; College of William and Mary; Georgetown University

2010: University of British Columbia (Sauder)

2011: University of Virginia

2012: DOJ; Michigan State University

2013: DOJ; Drexel University; Georgetown University (McDonough); Stony Brook University

2014: DOJ; University of California, Berkeley; UCLA; University of Virginia

2015: Clemson University; FTC; Indiana University (Kelley); University of Colorado, Boulder; Yale University

2016: Boston College; Columbia University; Federal Reserve Board; Harvard University; London School of Economics; University of British Columbia (Sauder); University of Texas, Austin; University of Toronto (Rotman)
2017: FTC; University of Kentucky; University of Pennsylvania (Econ/Wharton); University of Wisconsin–Madison
2018: FTC; MIT; Texas A&M; Penn State University
2019: Harvard (HBS); Toulouse School of Economics; MINES ParisTech; KU Leuven; University of Mannheim; Berlin Applied Economics
2020: Research Institute of Industrial Economics (RIFN); Sciences Po; University of Düsseldorf (DICE); Directorate-General for Competition of the European Commission (DG COMP); Hong Kong University of Science and Technology (HKUST, scheduled); Washington University (St. Louis, scheduled)

Conference Presentations

APIOS (2018); Association of Competition Economics (2018); Barcelona GSE Summer Forum (2018); DC IO Day (2020); ESEM (2019); FTC Microeconomics (2010, 2014); Hal White Antitrust (2013, 2014, 2017, 2019); IEF Applied Microeconomics (2016); IIOC (2008, 2009, 2013, 2015, 2016, 2018); NASMES (2019); SEA (2013, 2018); Searle Antitrust (2013, 2015); Triangle Microeconomics (2016)

Conference Discussions

AEA (2015); DC IO Day (2015); Toulouse Digital Economics Conference (2020); HEC Montreal–RIIB Conference on IO (2018); IIOC (2008, 2009, 2013, 2015, 2016, 2018); NY IO Day (2020, scheduled); SEA (2013, 2018); Searle Antitrust (2018)

Panels

"Upward Pricing Pressure and Simulation in Merger Review," Economists Roundtable with the Canadian Competition Bureau, 2017.

"Institutional Shareholdings: Is There an Antitrust Issue?" Concurrences Global Antitrust Conference, 2018.

"Digital Mergers: Need for Reform?" Concurrences International Mergers Conference, 2020.

Teaching

Firm Analysis and Strategy, MBA Core Curriculum
Industrial Organization, PhD Economics
Strategic Pricing, MBA Elective
Microeconomics, Executive Education

Ph.D Advising

Georgetown University (Economics)
Francisco Garrido, 2020, ITAM.
Current: Minji Kim, Ryan Mansley, Tianshi Mu, Gretchen Sileo.

Service

Georgetown University
Graduate School Curriculum and Standards Committee: 2013-2019
Strategy Area Recruiting Committee: 2015-2016, 2016-2017

Other Service
Editorial Board, *Review of Industrial Organization*, 2019-present
DC IO Day: Program Committee 2015-2019, Organizer 2017
IIOC: Program Committee, 2019, 2020

Referee reports for:

American Economic Journal; American Economic Review; Econometrica; European Economic Review; International Journal of Industrial Organization; Journal of Economics & Management Strategy; Journal of the European Economics Association; Journal of Finance; Journal of Industrial Economics; Journal of Law and Economics; Journal of Political Economy; Management Science; National Science Foundation; *The RAND Journal of Economics; Review of Economic Studies; Review of Economics and Statistics; Review of Industrial Organization; Quarterly Journal of Economics,* others.

Appendix C

CT-2019-005

THE COMPETITION TRIBUNAL

IN THE MATTER OF the *Competition Act*, R.S.C. 1985, c. C-34, as amended;

AND IN THE MATTER OF the acquisition by Parrish & Heimbecker, Limited of certain grain elevators and related assets from Louis Dreyfus Company Canada ULC;

AND IN THE MATTER OF an application by the Commissioner of Competition for one or more orders pursuant to section 92 of the *Competition Act*.

BETWEEN:

THE COMMISSIONER OF COMPETITION

Applicant

– and –

PARRISH & HEIMBECKER, LIMITED

Respondent

ACKNOWLEDGEMENT OF EXPERT WITNESS
NATHAN H. MILLER

I, **Nathan H. Miller**, acknowledge that I will comply with the Competition Tribunal's code of conduct for expert witnesses which is described below:

1. An expert witness who provides a report for use as evidence has a duty to assist the Tribunal impartially on matters relevant to his or her area of expertise.

2. This duty overrides any duty to a party to the proceeding, including the person retaining the expert witness. An expert is to be independent and objective. An expert is not an advocate for a party.

September 4, 2020

(Date)

Nathan Miller

(Signature of expert witness)

CT-2019-005

THE COMPETITION TRIBUNAL

IN THE MATTER OF the *Competition Act*, R.S.C. 1985, c. C-34, as amended;

AND IN THE MATTER OF the acquisition by Parrish & Heimbecker, Limited of certain grain elevators and related assets from Louis Dreyfus Company Canada ULC;

AND IN THE MATTER OF an application by the Commissioner of Competition for one or more orders pursuant to section 92 of the *Competition Act*.

BETWEEN:

THE COMMISSIONER OF COMPETITION

Applicant

– and –

PARRISH & HEIMBECKER, LIMITED

Respondent

ACKNOWLEGEMENT OF EXPERT WITNESS
NATHAN H. MILLER

Appendix D

Appendix D
Documents Relied Upon by Nathan H. Miller

Document Title, Bates Numbers, Date

Declarations

Witness Statement of [redacted], September 3, 2020

Witness Statement of [redacted], August 11, 2020

Witness Statement of [redacted], August 26, 2020

Witness Statement of [redacted], August 25, 2020

Witness Statement of [redacted], August 27, 2020

Witness Statement of [redacted], August 7, 2020

Witness Statement of [redacted], August 19, 2020

Examination for Discovery

John Heimbecker Examination for Discovery, July 15, 2020

John Heimbecker Examination for Discovery, July 16, 2020

John Heimbecker Examination for Discovery, July 17, 2020

Undertaking to Examination for Discovery

Questions Taken Under Advisement on the Examination of John Heimbecker, July 15–17, 2020

Responses to follow-up questions from John Heimbecker's examination for discovery, July 15, 2020, Appendix CC

Responses to follow-up questions from John Heimbecker's examination for discovery, July 17, 2020

Undertaking to John Heimbecker's Examination for Discovery, July 15, 2020, Appendix A

Undertaking to John Heimbecker's Examination for Discovery, July 15, 2020, Appendix B

Undertaking to John Heimbecker's Examination for Discovery, July 16, 2020, Appendix F

Undertaking to John Heimbecker's Examination for Discovery, July 17, 2020, Appendix Y

Undertaking to John Heimbecker's Examination for Discovery, July 17, 2020, Appendix Z

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Virden All Commodity Ticket Detail 2019 CWRS.xlsx

P&H

Appendix D - 2016-2018 Grain Purchases - Hamlin.xlsx

Appendix E - 2016-2018 Grain Purchases - Hanover Jct.xlsx

Appendix F - 2016-2018 Grain Purchases - Moosomin.xlsx

P&H_0005201_LEVEL A.XLSX

Third parties

Richardson

PMDC00004_000000001-CONFIDENTIAL LEVEL A.xlsx

PMDC00006_000000002-CONFIDENTIAL LEVEL A.xlsx

PMDC00007_000000002 - CONFIDENTIAL LEVEL A.xlsx

Viterra

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Cargill

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Ceres

PMDB00002_000000046-CONFIDENTIAL LEVEL A.xls

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Bunge

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PMJF00001_000000001-CONFIDENTIAL LEVEL A.xlsx

PMJF00001_000000002-CONFIDENTIAL LEVEL A.xlsx

PMJF00001_000000003-CONFIDENTIAL LEVEL A.xlsx

PMJF00001_000000004-CONFIDENTIAL LEVEL A.xlsx

G3

PMGB00001_000000017-CONFIDENTIAL LEVEL A.xlsx

ADM

RABE00001_000000001- CONFIDENTIAL LEVEL A.xlsx

Markups

#4 Virden A.xlsx

2017 P&L by Location by Month.xlsx

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LDCANADA P&L 2017 Virden & Wilkie.xlsx

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I considered parties responses to supplementary information requests, Commissioner's affidavit of documents produced, P&H's affidavit of documents produced, P&H's responses to undertakings, and all items in my Documents Relied Upon.

Note: In addition to the documents on this list, I relied upon all documents cited in my report, appendices, exhibits, and workpapers to form my opinions.