Economic Impact of Shopping Local on the North Battleford Regional Economy

PRAXIS

RESEARCH | STRATEGY | RESULTS

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Introduction

Buying local has been touted as an effective way to not only get high-quality customized goods, but also to give back to the community and support local businesses. It is undeniable that the "shop local" movement has made a resurgence in the past years, especially with the mass shift that local producers have made to online storefronts during the COVID-19 pandemic. Organizations such as "Shop Local Sask" serve both to raise awareness for local goods and services, as well as to allow easy identification and purchase from local producers.

Local businesses allow for better monetary circulation within a community; for example, one study shows that over 50% of revenue from local retailers is recirculated within the local economy compared to 14% from large chains and big box stores. Local retailers also operate at an average net annual return of $326 per 1000 square foot compared to larger chains which operate at an average annual deficit of $468 per 1000 square foot (Loco B.C., 2019).

Furthermore, shopping locally opens the doors for local retailers to generate higher customer retention rates. Compared to their national competitors, local firms average a 60% customer retention rate, with larger firms bringing in 39% (Loco B.C., 2019).

Praxis was commissioned by the Battlefords Chamber of Commerce to undertake a study of the economic impact of a 10% shift in shopping local.

Key Takeaways

Impact of increased local spending on the North Battleford Regional economy

A 10% increase in spending at local firms within the North Battleford Region could:

- Add 332 new positions to total employment;
- Increase total labour income by $15.9 million; and,
- Generate an extra $41.1 million in GDP with an increase of $72.7 million in total gross output.

This analysis presents results based on standard methodologies for estimating economic contributions for sub-national geographies. Results are the sum of direct, indirect, and induced impacts of shopping local on the North Battleford regional economy.

All impacts are considered relative to a Base Case: A local shopping rate increase of zero. Results below include direct, indirect, and induced impacts of a 10% shift to shopping locally. Direct impact is the total initial expenditure. Indirect impact is the secondary impact that includes inter-industry transactions: purchases of inputs from supporting industries. Induced impact is the additional impact from changes in household spending as additional labor is hired or reduced.

Gross Output measures total expenditures on local goods and services as well as payments to labour and business profits. Gross output is the total value of goods and services produced by an industry and includes intermediate inputs that are foreign and domestically produced goods and services used by an industry in the production of its gross output. Value added is the difference between gross output and

intermediate inputs and represents the value of labour and capital used in producing gross output. The sum of value added across all industries is equal to gross domestic product (GDP) for the economy.

GDP measures net economic activity within a prescribed geographic area. It represents the payments made to final factors of production: labour, unincorporated business profits, and other operating surplus (corporate profits, interest income, inventory valuation adjustments, and capital consumption allowances). GDP excludes the value of intermediate goods and services used in production. Labour income includes wages, salaries, and employer contributions to pensions and benefit packages.

Employment impacts are measured in positions and contain a mix of full and part-time positions. Employment results are rounded to the nearest whole number, and as such, columns sums may not necessarily add to the table total.

Table 1: Total Local Impacts: Shifting to 10% Local Shopping

Local Impacts: 10% Shopping Local	Gross Output ($M)	Gross Domestic Product ($M)	Employment (Positions)	Labour Income ($M)
Total Impact	72.7	41.1	332	15.9

Assumptions

2016 Census median household income for the North Battleford Region was multiplied by the number of households in the Region. This was inflated to 2021 levels using the Saskatchewan All items Consumer Price Index (CPI) and allocated across the industry/commodity mix available in the North Battleford Region Economic Model. The North Battleford Region under study is the North Battleford Census Agglomeration (CA). The North Battleford CA includes: Battleford (Town), North Battleford (Crown colony), North Battleford (City), and North Battleford No. 437 (Rural municipality).

Method

This analysis presents results based on standard methods for estimating economic contributions for sub-national geographies. Results are the sum of direct, indirect, and induced impacts on the local economy of a 10% increase in local shopping.

All impacts are considered relative to a Base Case: no shopping local initiative.

Introduction

Buying local has been touted as an effective way to not only get high-quality customized goods, but also to give back to the community, and support local businesses. It is undeniable that the "shop local" movement has made a resurgence in the past years, especially with the mass shift that local producers have made to online storefronts during the COVID-19 pandemic. Organizations such as "Shop Local Sask" serve to both raise awareness for local goods and services, while allowing for easy identification and purchase from local producers.

Local businesses allow for better monetary circulation within a community, one study shows that over 50% of revenue from local retailers is recirculated within the local economy, compared to 14% from large chains and big box stores. Local retailers also operate at an average net annual return of $326 per 1000 square foot compared to larger chains which operate at an average annual deficit of $468 per 1000 square foot (Loco B.C., 2019).

Furthermore, shopping locally opens the doors for local retailers to generate higher customer retention rates. Compared to their national competitors, local firms average a 60% customer retention rate, with larger firms bringing in 39% (Loco B.C., 2019). A high rate of customer retention is incredibly beneficial to any firm, largely due to word-of-mouth marketing. The more loyal a customer is to a firm, the more likely that customer is to recommend the firm to others. A study done by the Mediterranean Journal of Social Sciences shows that a loyal customer 84% more likely to share positive experiences with a firm with those close to them, and 93% of those surveyed stated that they make a majority of their purchasing decisions on recommendations. A firm generates more business as they retain loyal customers, which allows for a cycle of higher revenue for the local firm and more reinvestment into the community. These benefits show that shopping local is not only a solid driver for local economies, but also a factor that generates a higher sense of community and connection, one that is sorely needed during a pandemic.

Method

This analysis presents results based on standard methodologies for estimating economic contributions for sub-national geographies. Results are the sum of direct, indirect, and induced impacts for the North Battleford Region and its local firms.

To estimate benefits seen in the North Battleford Region from increasing spending at local firms, a separate economic model was employed for the North Battleford Region using the latest provincial input-output tables available. An input-output table is a means of presenting a detailed analysis of the process of production and the use of goods and services (products) and the income generated in that production. The Saskatchewan model is rectangular in nature with 35 industries and 66 commodities and based on a standardized methodology (Statistics Canada's) and will yield results similar to Statistics Canada's inter-provincial model and the Conference Board of Canada's STEAM Model. Model description and definitions are available in Appendix A. Key to this analysis was the estimation of impacts at the regional level for the North Battleford Region. Regional level impacts were estimated by constructing a separate economic impact model for the region using regional employment by industry to estimate regional output, a community hierarchy model to assess regional trade flows and leakages, and re-balancing to ensure model cohesiveness. The North Battleford Region model is a square model with 25 industries. A more detailed discussion of the regional input-output models is available in Appendix B.

2016 Census household median income for the North Battleford Region was multiplied by the number of households in the Region. This was inflated to 2021 levels using the Saskatchewan All items Consumer Price Index (CPI) and allocated across the industry/commodity mix available in the North Battleford Region Economic Model. The North Battleford Region under study includes the North Battleford Census Agglomeration (CA). The North Battleford CA includes: Battleford (Town), North Battleford (Crown colony), North Battleford (City), and North Battleford No. 437 (Rural municipality).

Results

The results below are direct, indirect, and induced impacts for the fiscal expansion resulting from increased spending in the local economy. All impacts are considered relative to the Base Case: no increase

Direct impact is the total initial expenditure.

Indirect impact is the secondary impact that includes inter-industry transactions: purchases of inputs from supporting industries.

Induced impact is the additional impact from changes in household spending as industries add labour in response to higher levels of demand for output.

Gross Output measures total expenditures on local goods and services as well as payments to labour and business profits.

Gross Domestic Product measures net economic activity within a prescribed geographic area. It represents the payments made to final factors of production: labour, unincorporated business profits, and other operating surplus (corporate profits, interest income, inventory valuation adjustments, and capital consumption allowances).

GDP excludes the value of intermediate goods and services used in production.

Direct indirect and induced employment impacts are measured in positions.

Labour income includes wages, salaries, and employer benefits. Labour income includes wages, salaries, and employer contributions to pensions and benefit packages.

Economic model results are shown in the table below.

Table 2: Direct, Indirect, and Induced Impacts: 10% Shift towards Shopping Local

	North Battleford Region
Gross Output ($M)	
Direct	52.4
Indirect	11.0
Induced	9.4
Total Gross Output	**72.7**
Gross Domestic Product ($M)	
Direct	29.3
Indirect	6.2
Induced	5.6
Total Gross Domestic Product	**41.1**
Employment (Positions)	
Direct	251
Indirect	34
Induced	47
Total Employment	**332**
Labour Income ($M)	
Direct	11.7
Indirect	2.1
Induced	2.2
Total Labour Income	**15.9**

Detailed Impacts by Industry

Impacts by industry of a 10% shift to shopping local are outlined in Tables 3 through 6. The bulk of direct activity occurs within the retail and finance, real-estate and rental industries. Indirect impacts occur within largely within the professional services and business services industries reflecting the high proportion of specialized services required for retail operation. Induced impacts, which represent the additional impacts of consumer spending of wages earned, is concentrated heavily within the retail trade and service industries.

Table 3: Impacts by Industry – Total

	Gross Output Impact ($M)	GDP at Basic Prices Impact ($M)	Employment Impact (Positions)	Labour Income Impact ($M)
Crop and Animal Production	2.0	0.8	4	0.1
Forestry and Logging	0.0	0.0	0	0.0
Fishing, Hunting and Trapping	0.0	0.0	0	0.0
Support Activities for Agriculture and forestry	0.0	0.0	0	0.0
Mining and Oil and Gas Extraction	1.3	0.8	1	0.2
Utilities	2.8	1.8	3	0.4
Construction	1.1	0.4	2	0.2

	Gross Output Impact ($M)	GDP at Basic Prices Impact ($M)	Employment Impact (Positions)	Labour Income Impact ($M)
Manufacturing	11.9	3.1	15	1.4
Wholesale Trade	2.9	1.9	10	0.9
Retail Trade	8.7	5.6	87	3.4
Transportation and Warehousing	3.1	1.6	11	0.6
Information and Cultural Industries	3.3	1.8	9	0.9
Finance, Insurance, Real Estate and Rental and Leasing	22.5	15.6	40	2.8
Professional, Scientific and Technical Services	1.2	0.8	6	0.4
Administrative and Support, Waste Management and Remediation Services	0.5	0.3	2	0.2
Educational Services	0.2	0.1	3	0.1
Health Care and Social Assistance	1.5	1.0	10	0.4
Arts, Entertainment and Recreation	1.2	0.6	23	0.4
Accommodation and Food Services	4.4	2.1	66	1.5
Other Services (Except Public Administration)	1.2	0.8	14	0.5
Operating, Office, Cafeteria and Laboratory Supplies	0.0	0.0	0	0.0
Travel, Entertainment, Advertising and Promotion	0.0	0.0	0	0.0
Transportation Margins	0.0	0.0	0	0.0
Non-Profit Institutions Serving Households	0.5	0.3	6	0.3
Government Sector	2.5	1.6	18	1.3
Total	**72.7**	**41.1**	**332**	**15.9**

Table 4: Impacts by Industry – Direct

	Gross Output Impact ($M)	GDP at Basic Prices Impact ($M)	Employment Impact (Positions)	Labour Income Impact ($M)
Crop and Animal Production	0.6	0.2	1	0.0
Forestry and Logging	0.0	0.0	0	0.0
Fishing, Hunting and Trapping	0.0	0.0	0	0.0
Support Activities for Agriculture and forestry	0.0	0.0	0	0.0
Mining and Oil and Gas Extraction	0.3	0.2	0	0.0
Utilities	1.4	0.9	2	0.2
Construction	0.1	0.0	0	0.0
Manufacturing	10.3	2.7	13	1.2
Wholesale Trade	2.4	1.6	8	0.7
Retail Trade	6.6	4.3	67	2.6
Transportation and Warehousing	1.6	0.9	6	0.3
Information and Cultural Industries	2.2	1.2	6	0.6

	Gross Output Impact ($M)	GDP at Basic Prices Impact ($M)	Employment Impact (Positions)	Labour Income Impact ($M)
Finance, Insurance, Real Estate and Rental and Leasing	16.8	11.7	29	2.1
Professional, Scientific and Technical Services	0.3	0.2	1	0.1
Administrative and Support, Waste Management and Remediation Services	0.1	0.1	1	0.1
Educational Services	0.1	0.1	3	0.1
Health Care and Social Assistance	1.3	0.9	9	0.4
Arts, Entertainment and Recreation	1.0	0.5	18	0.3
Accommodation and Food Services	3.6	1.7	54	1.2
Other Services (Except Public Administration)	1.2	0.7	13	0.5
Operating, Office, Cafeteria and Laboratory Supplies	0.0	0.0	0	0.0
Travel, Entertainment, Advertising and Promotion	0.0	0.0	0	0.0
Transportation Margins	0.0	0.0	0	0.0
Non-Profit Institutions Serving Households	0.5	0.3	6	0.3
Government Sector	1.9	1.2	14	1.0
Total	**52.4**	**29.3**	**251**	**11.7**

Table 5: Impacts by Industry – Indirect

	Gross Output Impact ($M)	GDP at Basic Prices Impact ($M)	Employment Impact (Positions)	Labour Income Impact ($M)
Crop and Animal Production	1.2	0.5	3	0.0
Forestry and Logging	0.0	0.0	0	0.0
Fishing, Hunting and Trapping	0.0	0.0	0	0.0
Support Activities for Agriculture and forestry	0.0	0.0	0	0.0
Mining and Oil and Gas Extraction	0.9	0.6	1	0.1
Utilities	0.8	0.5	1	0.1
Construction	0.8	0.3	2	0.2
Manufacturing	0.9	0.2	1	0.1
Wholesale Trade	0.3	0.2	1	0.1
Retail Trade	0.4	0.3	4	0.2
Transportation and Warehousing	1.1	0.6	4	0.2
Information and Cultural Industries	0.6	0.3	2	0.1
Finance, Insurance, Real Estate and Rental and Leasing	2.4	1.7	4	0.3
Professional, Scientific and Technical Services	0.7	0.5	4	0.3

	Gross Output Impact ($M)	GDP at Basic Prices Impact ($M)	Employment Impact (Positions)	Labour Income Impact ($M)
Administrative and Support, Waste Management and Remediation Services	0.3	0.2	1	0.1
Educational Services	0.0	0.0	0	0.0
Health Care and Social Assistance	0.0	0.0	0	0.0
Arts, Entertainment and Recreation	0.1	0.0	1	0.0
Accommodation and Food Services	0.2	0.1	3	0.1
Other Services (Except Public Administration)	0.0	0.0	0	0.0
Operating, Office, Cafeteria and Laboratory Supplies	0.0	0.0	0	0.0
Travel, Entertainment, Advertising and Promotion	0.0	0.0	0	0.0
Transportation Margins	0.0	0.0	0	0.0
Non-Profit Institutions Serving Households	0.0	0.0	0	0.0
Government Sector	0.3	0.2	2	0.2
Total	**11.0**	**6.2**	**34**	**2.1**

Table 6: Impacts by Industry – Induced

	Gross Output Impact ($M)	GDP at Basic Prices Impact ($M)	Employment Impact (Positions)	Labour Income Impact ($M)
Crop and Animal Production	0.2	0.1	0	0.0
Forestry and Logging	0.0	0.0	0	0.0
Fishing, Hunting and Trapping	0.0	0.0	0	0.0
Support Activities for Agriculture and forestry	0.0	0.0	0	0.0
Mining and Oil and Gas Extraction	0.1	0.1	0	0.0
Utilities	0.5	0.3	1	0.1
Construction	0.2	0.1	0	0.0
Manufacturing	0.7	0.2	1	0.1
Wholesale Trade	0.2	0.1	1	0.1
Retail Trade	1.6	1.1	16	0.6
Transportation and Warehousing	0.4	0.2	2	0.1
Information and Cultural Industries	0.5	0.3	2	0.1
Finance, Insurance, Real Estate and Rental and Leasing	3.3	2.3	6	0.4
Professional, Scientific and Technical Services	0.2	0.1	1	0.1
Administrative and Support, Waste Management and Remediation Services	0.1	0.0	0	0.0
Educational Services	0.0	0.0	1	0.0
Health Care and Social Assistance	0.1	0.1	1	0.0

	Gross Output Impact ($M)	GDP at Basic Prices Impact ($M)	Employment Impact (Positions)	Labour Income Impact ($M)
Arts, Entertainment and Recreation	0.2	0.1	3	0.1
Accommodation and Food Services	0.7	0.3	10	0.2
Other Services (Except Public Administration)	0.0	0.0	0	0.0
Operating, Office, Cafeteria and Laboratory Supplies	0.0	0.0	0	0.0
Travel, Entertainment, Advertising and Promotion	0.0	0.0	0	0.0
Transportation Margins	0.0	0.0	0	0.0
Non-Profit Institutions Serving Households	0.0	0.0	0	0.0
Government Sector	0.3	0.2	2	0.2
Total	**9.4**	**5.6**	**47**	**2.2**

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Appendix A: Definitions and Model Description

Employment: measured in positions.

Final Demand: sum of personal expenditure, government purchases of goods and services, business and government investment, and net exports.

GDP at factor cost: measure of net economic activity within a prescribed geographic area. It represents the payments made to final factors of production: labour, unincorporated business profits, and other operating surplus (corporate profits, interest income, inventory valuation adjustments, and capital consumption allowances). GDP at factor cost excludes the value of intermediate goods and services used in production.

GDP at market prices: GDP at factor cost plus indirect taxes less subsidies.

Gross Output: total expenditures on local goods and services as well as payments to labour and business profits. Gross output includes double counting because it includes the value of inputs used in production rather than net value added alone.

Direct Impact: total project expenditure, usually construction or operating outlays.

Indirect Impact: the secondary impact that includes inter-industry transactions, purchases of inputs from supporting industries.

Induced Impact: the additional impact from changes in household spending as industries modify labour input requirements in response to altered levels of demand for output.

Industry outputs are calculated as $(I-D(I-\mu-\alpha-\beta)B)^{-1} D((I-\mu-\alpha-\beta)e^*+(I-\mu-\beta)Xd+(I-\mu)Xr)=X$

Where:

I = an identity matrix of industry-by-industry dimension.

D = a matrix of coefficients representing commodity output proportions.

B= a matrix of coefficients representing commodity input proportions (technical coefficients) by industry.

μ = a diagonal matrix whose elements represent the ratio of imports to use.

α = a diagonal matrix whose elements represent the ratio of government production to use.

β = a diagonal matrix whose elements represent the ratio of inventory withdrawals to use.

e^* = final demand categories of consumption, government purchases of goods and services, business and government investment, and inventory additions.

Xd = final demand category of domestic exports.

Xr = final demand category of re-exports.

Employment is calculated as a fixed number of positions per dollar of industry output.

Appendix B: Developing Community Level Input-Output Models

The latest available provincial input-output tables at the S-Level from Statistics Canada were used as the starting point. The table represents 25 industries and 18 components of final demand (based on the 2017 S-level aggregation, the latest available). The tables were converted into industry-by-industry space.

In a square input-output table, each industry in the table can be represented as a column. For example industry 1 can be represented as follows:

$$
\begin{bmatrix}
z11 \\
z12 \\
. \\
. \\
. \\
z125 \\
w1 \\
X1
\end{bmatrix}
$$

zij = purchases by industry i of products from industry j. The transactions matrix consists of z11 to z2525 comprise the transactions matrix of 625 (25 x 25) elements.

W1 = value added or gross domestic product component of industry 1's output which includes wages, salaries, supplementary labour income, unincorporated business profits, incorporate income profits, other income, and depreciation.

X1 = industry 1's total output, which equals W1 plus the sum of z11 to z25.

To create sub-provincial models, four challenges must be overcome:

Allocation of provincial gross output by community/region

Estimation of technical coefficients by industry at a community/regional level

Estimation of components of gross domestic product by industry at a community/regional level

Allocation of provincial final demand output by community/region.

Census data on labour force by industry will be used to allocate gross output by industry for the region/community. Regional gross output for industry i is estimated:

$XRi = $ Labour $ForceRi/$Labour $ForceSki \times XSki$

Where:

XRi = regional gross output for industry i

Labour ForceRi = regional labour force for industry i

Labour ForceSki = provincial labour force for industry i

XSki = provincial gross output for industry i

To estimate items in each regional transaction matrix (zij) it will be assumed in all cases that the provincial input structure will apply to regional industries. The components of the regional transaction matrix are estimated:

$$zR_{ij} = zSK_{ij}/XSk_i \times XR_i$$

Where:
zR_{ij} = an element of the regional transactions matrix.
zSK_{ij} = the corresponding element of the provincial transactions matrix.

The same methodology is used for estimating the components of GDP.

$$WR_i = WSk_i/XSk_i \times XR_i$$

Where:
WR_i = regional value added or gross domestic product component of industry i's output
WSk_i = provincial value added or gross domestic product component of industry i's output

The components of final demand are estimated as follows. Personal expenditures are based on a per capita allocation of provincial spending.

$$PER_i = PESk_i/PopSk \times PopR$$

Where:
PER_i = Regional personal expenditure on industry i's output
$PESk_i$ = Provincial personal expenditure on industry i's output
$PopSk$ = Provincial population
$PopR$ = Regional population

Gross capital formation (GFCF) or investment by industry is estimated applying the regional share industry to total provincial gross capital formation for each industry. The same approach is used to estimate exports (Xd), imports (M), and inventory changes by industry (VPC)

$$GFCFR_i = XR_i/XSk_i \times GFCFSk_i$$

$$XdR_i = XR_i/XSk_i \times XdSk_i$$

$$MR_i = XR_i/XSk_i \times MSk_i$$

$$VPCR_i = XR_i/XSk_i \times VPCSk_i$$

Where:
$GFCFR_i$ = Regional investment spending on industry i's output.
$GFCFSk_i$ = Provincial investment spending on industry i's output

XdRi = Regional exports of industry i's output
XdSki = Provincial exports of industry i's output
MRi = Regional imports of industry i's output
MSki = Provincial imports of industry i's output
VPCRi = Regional inventory changes of industry i's output
VPCSki = Provincial inventory changes of industry i's output

Regional public administration employment is used to allocate provincial government current expenditures by region.

GCERi = PAER/PAESk x GCESki

Where:
GCERi = Regional government current expenditures on industry i's output
PAER = Regional public administration labour force
PAESk = Provincial public administration labour force
GCESki = Provincial government current expenditures on industry i's output

It is also necessary to adjust for leakages for intra-provincial imported factors of production. These are estimated residually: If the sum of the use (both Final Demand and Inter-industry sales) of industry i's output is less than Xi then, intra-provincial exports are used to balance. Similarly, if use is greater than Xi intra-provincial imports are used the balance.

Intra-provincial exports/imports and exports due to out-shopping are estimated by calculating the marginal propensity to out-shop (the ratio of major community per capita retail sales to provincial per capita retail sales and multiplying by PE. Imports and exports are adjusted by this amount.

The estimation of intra-provincial imports into a region/community and incorporation of intra-provincial imports into the region/community model's leakages will constrain local multipliers to values not exceeding provincial level multipliers.

Developing Community/Regional Impact Models

Industry outputs in response to a shock in final demand are calculated as $(I-(I-\mu-\alpha-\beta)A)-1((I-\mu-\alpha-\beta)e^*+(I-\mu-\beta)Xd+(I-\mu)Xr)=X$

Where:
I = an identity matrix of industry by industry dimension
A = a matrix of technical coefficients representing inter-industry purchases (zij) divided by own industry gross output Xi.
μ = a diagonal matrix whose elements represent the ratio of imports to use
α = a diagonal matrix whose elements represent the ratio of government production to use
β = a diagonal matrix whose elements represent the ratio of inventory withdrawals to use

e* = final demand categories of consumption, government purchases of goods and services, business and government investment, and inventory additions.

Xd = final demand category of domestic exports

Xr = final demand category of re-exports.

Employment is calculated as a fixed number of positions per dollar of industry output.

GDP components are calculated based on a fixed ratio of Wi to industry output.