



Economic Impact of Increasing Local Buying in Olmsted County and Rochester, Minnesota

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A thriving regional economy is a critical component of the success of any community. Cities, counties, and states invest many resources into cultivating and growing the local economy. One of the most visible and publicized methods for adding jobs and revenue to a local economy is to recruit new companies and businesses to the region. However, there are other ways to expand the economy. Increasing local purchases of goods and services is one such alternative method to generate economic activity.

Increasing local purchases goes far beyond just increasing retail sales. Businesses and industries in a local economy import substantial amounts of goods and services from outside the region for use in the production process. If a small portion of those purchases are made locally, instead of from outside the region, the local economy will benefit. For companies to make the switch to local products, they must be assured of a local supply that is of sufficient quality, quantity, and price.

What then, is the economic impact of increasing local purchases? Dave Swenson of Iowa State University addressed this question directly for the City of Marshalltown and Marshall County in Iowa¹. This report will attempt to answer that same question for Olmsted County and the City of Rochester in Minnesota using the methodology established by Mr. Swenson.

For this report the main research question is: what potentially happens to the local economy if five percent of commodities currently imported are purchased locally instead? Put another way, what will happen to the local economy if companies, residents and government lower imports by five percent and instead buy those commodities locally?

In order to formulate an answer to this question, one must first study the local economy. This includes measuring current local output, employment, wages, and imports. With this knowledge, one can determine by how much imports will decline and by how much local purchases will increase given a five percent import substitution. Finally, this information can be entered into a special economic model, called an input-output model, to measure the total economy-wide impact of the initial increase.

Input-output models are widely used in economics to study the structure of an economy. They quantify the flow of dollars to and from industries, households, governments and other final demand. A popular input-output model is IMPLAN (IMPact Analysis for PLANning). All data and analysis in this report is based on IMPLAN, unless otherwise noted.

The Current Local Economy

Currently, Olmsted County and the City of Rochester have a well-established economy. Table 1 details the current economic structure in Olmsted County. Total industrial output is the value of

¹"Buying Local in Marshall County and Marshalltown, Iowa: An Economic Impact Assessment". Dave Swenson. Iowa State University. March 2006.

all goods and services produced in the county. Olmsted County produced nearly \$13.5 billion dollars of goods and services in 2003. In order to create these goods and services, firms in Olmsted County purchased \$7.9 billion of commodity inputs and paid \$5.5 billion to value added sources.

Of purchased commodity inputs, just under two-thirds (62.9%) were imported. Imports include all commodities brought in from outside Olmsted County. This includes commodities from neighboring counties, the rest of the state of Minnesota, the nation and abroad. The remaining third of commodity inputs used by firms were produced locally.

Total Industrial Output	\$13,472
Commodity Inputs	\$7,926
Imports	\$4,987
Locally-Produced	\$2,939
Value Added	\$5,546
Employees Compensation	\$3,672
Proprietor Income	\$401
Returns to Investors	\$1,128
Indirect Business Taxes	\$344

Firms (industry) are not the only actors that bring imports into the region. Institutions, including households and government, also import commodities into Olmsted County. In 2003, institutions consumed \$6.9 billion in commodities. Of these, approximately \$2.1 billion or 30 percent were imported.

Total Institutional Demand	\$6,910
Locally Supplied Demand	\$4,844
Imported Demand	\$2,066
Total Household Demand	\$3,883

Total imports into the region, therefore, include both those for intermediate demand (industry) and for final demand (institutions). In 2003, Olmsted County's total imports were valued at \$7.1 billion. However, it is not realistic to apply a five percent increase to the total value of imports. First, large companies that import a major amount of commodities will improperly weight the analysis. Second, not all goods that are used in the production process are available locally. A full explanation of both of these drawbacks follows.

Olmsted County is host to two major companies that influence not only the local economy, but the state economy as well. One of these companies is a world-renowned and internationally respected hospital. Another is a large computer manufacturing company. Both of these firms have a substantial influence on the goods and services produced locally and imported from outside the region, therefore, they merit special consideration in this report.

According to 2003 data, the hospital is the largest single employer in Olmsted County. However, the computer manufacturing firm is the largest single source of total industrial output in the region. This is not surprising as health care is an extremely labor-intensive industry as compared to computer manufacturing.

The computer manufacturing firm is also a major importer as it needs many commodities for the manufacturing process. Thus, it is important to consider how this industry will affect the results of this analysis. For the purpose of this report, imports related to computer manufacturing will be removed since substituting five percent of imports in one industry may not be feasible. In addition, the sheer number of imports in the computer manufacturing sector heavily weights the analysis. The complete analysis with computer manufacturing included will be presented in the appendix for those that are interested. Imports for the hospital and medical industries will be included because imports for medical purposes are much more limited in scope.

Table 3: All Imports into Olmsted County 2003 (millions)	
Industrial Imports	\$4,987
Industrial Imports without Computer Manufacturing	\$3,646
Household and Institutional Imports	\$2,066
Total Imports	\$7,052

A second consideration in the determination of the amount of imports that can be substituted is availability. Not all commodities used as inputs into production processes in Olmsted County are produced locally. For example, some industries in Olmsted County use coal to create their product. However, coal is not mined in Olmsted County and is not likely to be mined in Olmsted County. Therefore, it is unrealistic to expect businesses and households to purchase locally produced coal.

Imports are broken into categories in table 4. Commodities that are currently imported and are also produced locally and are not related to computer manufacturing total \$4.343 billion. These are the commodities that could potentially be purchased locally instead of imported. Approximately \$1 billion of commodities are imported into the region that are simply not available locally. Local businesses and institutions could not increase local purchases of these commodities because they are not available from local suppliers. Finally, total computer manufacturing imports are valued at \$1.6 billion.

	Industrial	Institutional	Total
Imported Commodities Produced Locally (excluding computer manufacturing)	\$2,978.125	\$1,364.640	\$4,342.765
Imported Commodities Not Produced Locally (excluding computer manufacturing)	\$668.343	\$427.620	\$1,095.963
Imported Commodities related to computer manufacturing	\$1,340.357	\$273.836	\$1,614.193
Total Imported Commodities	\$4,986.825	\$2,066.096	\$7,025.921

Based on the information in table 4, one can establish the value of a five percent substitution of local commodities for imports by both industry and institutions. If industries in Olmsted County substitute five percent of imports for local commodities, local production would increase by \$148.9 million. Similarly, if institutions (including households and government) substituted five percent of their current imports for locally available commodities in Olmsted County, local production would increase by \$68.2 million.

Impact of Increased Local Purchasing

Increasing local production by increasing local purchases will increase total output (sales) in the economy by more than just the initial five percent. When demand increases in one industry, the effects are felt across all industries and institutions. When one industry increases its production to meet an increase in demand, it simultaneously increases its demand for its inputs and orders more from its suppliers. Therefore, suppliers must increase their output and demand more of *their* suppliers and so on. This causes a ripple effect in the local economy as each layer of the supply chain has to increase production to meet the new demand. To the extent that the increased demand is satisfied by local production, the increases in the supply chain are captured and can be attributed to the initial change in demand.

Input-output models are designed to measure the effects of an initial change in the economy. In this analysis, the initial impact is the substitution of local commodities for five percent of previously imported items. In input-output terminology, this is the direct impact. The value of the additional economic activity being created by the initial change is called the indirect impact. Indirect impacts are separated into indirect and induced effects. While complicated, in general, indirect effects are those that accrue from the increase in the purchase of commodity inputs. Induced effects are those associated with an increase in household incomes from increased employment. Added together, direct and indirect effects amount to total impact. Multipliers are a standardized way to interpret the total change associated with the initial change. For instance, a multiplier of 1.40 indicates that for every \$1 in initial increase in output, total output will increase by \$1.40.

As mentioned earlier, there are two major groups that make purchases in a local economy. The first is industry. These are the companies and businesses that take inputs and turn them into a further product for sale. They are intermediate users. The second is institutions. Institutions are final demand consumers. Their purchases are considered to be for final consumption. This report has already measured the value of each group substituting locally produced commodities

for imports. In order to measure the value of each, the analyses will be handled separately. The first analysis presented is for a five percent substitution of local purchases for imports by industry and the second for a five percent substitution by institutions.

For both analyses, it was necessary to identify the top twenty commodity imports and use these as a proxy for all commodity imports. The total value of a five percent increase was distributed across the top twenty commodities to approximate for a five percent increase across all industries. A list of the top 20 commodities imported by both industry and institutions can be found in the appendix.

The results from the first analysis involving a substitution of locally-produced commodities for imported commodities is shown in table 5. If Olmsted County firms were to substitute five percent of their current non-computer manufacturing imports for comparable locally produced commodities, the Olmsted County economy would experience an initial increase in sales of \$149 million. Due to the increase in production necessary to supply this demand, another \$60 million of output would be created. Thus, if firms in Olmsted County reduced imports by five percent and instead used an equivalent amount of locally produced commodities, total output (sales) in the county would increase by \$208 million. Concurrently, an additional 1,639 employment opportunities would be available, 938 of which would be to satisfy the initial demand.

Olmsted County	Direct	Indirect	Induced	Total	Multiplier
Output	\$148,907,000	\$30,022,772	\$29,696,039	\$208,625,811	1.40
Labor Income	\$45,519,332	\$10,320,944	\$10,165,775	\$66,006,051	1.45
Employment	937.8	354.7	346.6	1,639.2	1.75

Table 6 details the results of the analysis apportioned to the City of Rochester. Data in the IMPLAN model is only for Olmsted County. Therefore, a formula must be used to determine how much of the impact will occur in Rochester. Two ratios are appropriate for approximating the amount of industrial activity in Rochester versus Olmsted County. The first is the ratio of total firms in the city compared to the county. The second is the ratio of retail sales in Rochester to Olmsted County. Because the majority of Olmsted County's firms (97%) and the majority of retail sales (92%) are in the City of Rochester, the majority of the impact of an increase in local commodity purchases by firms will be in the City of Rochester².

The impact of an increase in local purchases by institutions is smaller, as institutions import a much smaller amount of commodities. If institutions in Olmsted County were to substitute five percent of their imports for locally produced commodities, the economy in Olmsted County would expand by \$68 million initially. As local industries increased production to meet this local demand, another \$27 million in economic activity would occur, leading to a total increase of \$95 million.

² Number of firms from 2005 Covered Employment and Wages (CEW) data. Retail sales data is from the 2002 Economic Census.

Table 6: Economic Impact of Substituting Five Percent of Industrial Non-Computer Manufacturing Imports for Local Commodities in Rochester

Rochester	Direct	Indirect	Induced	Total	Multiplier
Output	\$132,777,364	\$26,770,699	\$26,479,358	\$186,027,421	1.40
Labor Income	\$40,588,669	\$9,202,977	\$9,064,616	\$58,856,262	1.45
Employment	836.2	316.3	309.1	1,462	1.75

Concurrently, employment would also have to expand. The initial change in output would mean an initial increase in employment of 533 workers. As production increased to meet this increase in demand, another 298 jobs would be created. Therefore, an increase of local purchases by institutions would lead to a total of 831 new jobs.

Table 7: Economic Impact of Substituting Five Percent of Institutional Non-Computer Manufacturing Imports for Local Commodities in Olmsted County

Olmsted County	Direct	Indirect	Induced	Total	Multiplier
Output	\$68,232,000	\$13,679,505	\$13,425,852	\$95,337,357	1.40
Labor Income	\$20,161,102	\$5,061,942	\$4,596,011	\$29,819,055	1.48
Employment	533.4	141	156.7	831.1	1.56

These values are apportioned to the City of Rochester in table 8. The factors used to apportion are the ratio of retail sales in Rochester to Olmsted County and the ratio of population in Rochester in comparison to Olmsted County. The amount attributed to Rochester is diminished because only 68% of Olmsted County's population lives in the City of Rochester³.

Table 8: Economic Impact of Substituting Five Percent of Institutional Non-Computer Manufacturing Imports for Local Commodities in Rochester

Rochester	Direct	Indirect	Induced	Total	Multiplier
Output	\$42,779,287	\$8,576,613	\$8,417,581	\$59,773,482	1.40
Labor Income	\$12,640,368	\$3,173,676	\$2,881,552	\$18,695,596	1.48
Employment	334.4	88.4	98.2	521.1	1.56

³Population data is United States Census Bureau estimates for 2005.

Conclusions

Substituting locally produced commodities for imports is one way to increase economic activity. Increasing the demand for local commodities not only increases the amount of commodities bought directly to meet the initial increase, but also generates even more economic activity to meet the increased demand for supplies. *In the case of Olmsted County, a substitution of locally produced commodities for five percent of current non-manufacturing, locally available imports across both industry and institutions would lead to a \$303 million increase in total economic output and an increase of 2,470 jobs, as shown in table 9.* The majority of this would be in Rochester as detailed in table 10.

Olmsted County	Direct	Indirect	Induced	Total	Multiplier
Output	\$217,139,000	\$43,702,277	\$43,121,891	\$303,963,168	1.40
Labor Income	\$65,680,434	\$15,382,886	\$14,761,786	\$95,825,106	1.46
Employment	1,471.2	495.7	503.3	2,470.2	1.68

Rochester	Direct	Indirect	Induced	Total	Multiplier
Output	\$175,556,651	\$35,347,313	\$34,896,939	\$245,800,903	1.40
Labor Income	\$53,229,037	\$12,376,653	\$11,946,169	\$77,551,859	1.46
Employment	1170.6	404.7	407.3	1,982.6	1.68

Industry is the leading importer into the region. Imports brought in to satisfy the need of industry in the county far outweigh the value of imports into the region by institutions. Industry imports slightly less than \$5 billion in commodities to institution's imports of just over \$2 billion. Further, institutions already buy the vast majority of their commodities locally (70 percent). Therefore, to fully experience the economic boost of replacing imports with local commodities, industry has to be a leading proponent. Simply increasing local retail sales will not drive a major increase in economic activity.

There are a couple of notes of caution to consider when interpreting this analysis. This analysis is based on substituting locally produced commodities for five percent of commodities that are currently imported. Five percent is an arbitrary number, used simply as a guide for the analysis. A five percent increase in local purchases may not be a realistic goal, particularly for some of the larger companies in the county. Although the analysis identified commodities that are currently produced locally, there is no guarantee that the commodity exists in sufficient quantity, quality, and variety to satisfy the new demand. The price must also be acceptable. Any effort to increase the use of local products to fulfill production needs would need to focus on matching

the locally available supplies with demand. It would also need to focus on educating companies and consumers and creating a perception that locally produced items are preferable to those already being imported.

Appendix A

In the main body of this report, the value of computer manufacturing commodity imports was removed from the analysis. This was done because computer manufacturing is an extraordinarily large component of the Olmsted County economy. Since one company dominates this industry, it is highly unlikely one company would be both willing and able to substitute five percent of its imports for local commodities. Further, local production in that one industry is unlikely to be physically capable of such a dramatic increase.

However, the economic importance of computer manufacturing should not be completely ignored. Therefore, this appendix contains the results of impact analysis that includes all commodity inputs, including computer manufacturing.

If all industries in Olmsted County were to exchange five percent of their current imports for locally supplied goods, they would increase local spending on inputs by \$209 million. As a result of the initial round of purchases, another \$88 million in output would be generated. Thus, the total impact of such an increase would be \$297 million. At the same time, new employment would be created. In order to supply industry with the initial commodities demanded, local firms would need to fill 993 new jobs. As a result of the stepped up demand created, an additional 916 jobs would be formed. Therefore, total employment in Olmsted County would increase by 1,909 due to the import substitution.

Olmsted County	Direct	Indirect	Induced	Total	Multiplier
Output	\$208,857,000	\$50,833,132	\$37,264,745	\$296,954,877	1.42
Labor Income	\$53,183,328	\$17,117,594	\$12,757,027	\$83,057,949	1.56
Employment	993.3	480.9	435	1,909.2	1.92

The majority of the economic impact of an increase in local purchases as substitutes for imports would be felt in the City of Rochester. This is because Rochester is home to most of the firms in Olmsted County and also the retail hub of the county.

Rochester	Direct	Indirect	Induced	Total	Multiplier
Output	\$186,233,568	\$45,326,877	\$33,228,220	\$264,788,665	1.42
Labor Income	\$47,422,499	\$15,263,413	\$11,375,183	\$74,061,095	1.56
Employment	885.7	428.8	387.9	1,702	1.92

Import substitution by institutions would also increase economic activity in Olmsted County. A five percent increase in local purchases instead of imports by institutions would cause an initial increase in economic output in Olmsted County of \$81 million. Due to this initial impact, a total of \$116 million would be generated in Olmsted County. This would also create 840 new jobs.

Table A3: Economic Impact of Substituting Five Percent of Institutional Imports for Local Commodities in Olmsted County

Olmsted County	Direct	Indirect	Induced	Total	Multiplier
Output	\$80,941,000	\$20,347,759	\$14,677,824	\$115,966,583	1.43
Labor Income	\$21,337,748	\$6,337,664	\$5,024,715	\$32,700,127	1.53
Employment	512.7	155.8	171.3	839.8	1.64

The City of Rochester would accrue the majority of the impact of an increase in institutional spending locally. However, since a large portion of the population does not live in the City of Rochester, the impact would be diminished.

Table A4: Economic Impact of Substituting Five Percent of Institutional Imports for Local Commodities in Rochester

Rochester	Direct	Indirect	Induced	Total	Multiplier
Output	\$50,747,425	\$12,757,396	\$9,202,527	\$72,707,348	1.43
Labor Income	\$13,378,087	\$3,973,513	\$3,150,336	\$20,501,936	1.53
Employment	321.4	97.7	107.4	526.5	1.64

Appendix B: Tables

Table B1: Top 20 Commodities Imported by Industry into Olmsted County 2003, Excluding Computer Manufacturing Imports and Value of Current Local Production (millions)

Commodity	Imports	Local Production
Wholesale trade ⁴	\$464.239	\$304.144
Software publishers	\$359.783	\$30.461
Real estate	\$211.643	\$177.041
Management of companies and enterprises	\$147.134	\$56.058
Animal - except poultry - slaughtering	\$123.800	\$2.961
Cattle ranching and farming	\$88.369	\$41.805
All other miscellaneous professional and technical services	\$79.899	\$13.008
Telecommunications	\$71.894	\$32.838
Pharmaceutical and medicine manufacturing	\$65.784	\$14.677
Other support service	\$60.468	\$10.410
Plastics plumbing fixtures and all other plastics	\$53.732	\$6.975
Securities - commodity contracts - investments	\$51.155	\$32.420
Legal services	\$49.532	\$73.996
Insurance carriers	\$44.293	\$39.257
Paperboard container manufacturing	\$44.240	\$7.419
Air transportation	\$42.211	\$3.166
Management consulting services	\$40.515	\$15.426
Monetary authorities and depository credit intermediaries	\$34.728	\$165.191
Motor vehicle parts manufacturing	\$32.779	\$4.312
Power generation and supply	\$32.571	\$29.521

⁴ A note about wholesale trade. Wholesale trade is subject to margins in IMPLAN analysis. This means that the value of wholesale trade has been adjusted to remove the value of the goods and services traded. Rather, wholesale trade measures the costs of buying and selling the goods and services, such as storage costs.

Table B2: Top 20 Commodities Imported by Institutions into Olmsted County 2003, Excluding Computer Manufacturing Imports and Current Local Production (millions)

Commodity	Imports	Local Production
Wholesale trade	\$108.768	\$304.144
Automobile and light truck manufacturing	\$105.878	\$1.368
Real estate	\$79.918	\$177.041
Insurance carriers	\$78.147	\$39.257
Telecommunications	\$67.323	\$32.838
Cut and sew apparel manufacturing	\$55.947	\$0.345
Pharmaceutical and medicine manufacturing	\$53.023	\$14.677
Colleges-universities-and junior colleges	\$41.196	\$2.399
Monetary authorities and depository credit	\$36.062	\$165.191
Funds - trusts- and other financial vehicles	\$35.400	\$7.696
Power generation and supply	\$35.181	\$29.524
Hospitals	\$29.234	\$757.192
Custom computer programming services	\$28.996	\$180.502
Religious organizations	\$27.063	\$1.084
Securities-commodity contracts-investments	\$26.281	\$32.420
Air transportation	\$24.700	\$3.166
Other ambulatory health care services	\$23.539	\$1,118.625
Food and beverage stores	\$22.754	\$61.502
Software publishers	\$22.262	\$30.461
Scientific research and development services	\$22.116	\$0.730

Table B3: Top 20 Commodity Imports by Industry into Olmsted County 2003 and Current Local Production (millions)

Commodity	Imports	Local Production
Semiconductors and related device manufacturing	\$670.482	\$12.225
Wholesale trade	\$464.239	\$304.144
Software publishers	\$359.783	\$30.461
Real estate	\$211.643	\$177.041
Management of companies and enterprises	\$147.134	\$56.058
Other computer and peripheral equipment manufacturing	\$132.248	\$45.359
Electronic computer manufacturing	\$128.441	\$4,592.397
Animal - except poultry - slaughtering	\$123.800	\$2.961
Computer storage device manufacturing	\$109.629	\$6.553
All other electronic component manufacturing	\$88.938	\$4.294
Cattle ranching and farming	\$88.369	\$41.805
All other miscellaneous professional and technical services	\$79.899	\$13.008
Telecommunications	\$71.894	\$32.838
Pharmaceutical and medicine manufacturing	\$65.784	\$14.677
Software reproducing	\$64.098	\$0.179
Other support services	\$60.468	\$10.410
Plastics plumbing fixtures and all other plastics	\$53.732	\$6.975
Securities - commodity contracts - investments	\$51.155	\$32.420
Legal services	\$49.532	\$73.996
Insurance carriers	\$44.293	\$39.257
Paperboard container manufacturing	\$44.240	\$7.419

Table B4: Top 20 Commodity Imports by Institutions into Olmsted County 2003 and Current Local Production (millions)

Commodity	Imports	Local Production
Electronic computer manufacturing	\$221.56	\$4,592.397
Wholesale trade	\$108.768	\$304.144
Automobile and light truck manufacturing	\$105.878	\$1.368
Real estate	\$79.918	\$177.041
Insurance carriers	\$78.147	\$39.257
Telecommunications	\$67.323	\$32.838
Cut and sew apparel manufacturing	\$55.947	\$0.345
Pharmaceutical and medicine manufacturing	\$53.023	\$14.677
Colleges-universities-and junior colleges	\$41.196	\$2.399
Monetary authorities and depository credit	\$36.062	\$165.191
Funds - trusts- and other financial vehicles	\$35.400	\$7.696
Power generation and supply	\$35.181	\$29.524
Other computer peripheral equipment manufacturing	\$30.336	\$45.359
Hospitals	\$29.234	\$757.192
Custom computer programming services	\$28.996	\$180.502
Religious organizations	\$27.063	\$1.084
Securities-commodity contracts-investments	\$26.281	\$32.420
Air transportation	\$24.700	\$3.166
Other ambulatory health care services	\$23.539	\$1,118.625
Food and beverage stores	\$22.754	\$61.502