

Buying Locally in Johnson County, Iowa: An Import-Substitution Economic Impact Assessment

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Introduction

One of the ways to boost economic activity in a region is to increase the purchases that are made from local suppliers of goods and services. The more businesses and people in an area purchase from local suppliers, the better it is for the regional economy, provided, of course, that both quality and value are not compromised by making a local selection. This short report highlights the economic development potential of increasing purchases of goods and services from regional providers rather than from providers outside of the area of analysis. In this study I am assessing the regional commodity import characteristics and import-substitution potential of Johnson County, Iowa. The combined urbanized area of Iowa City, Coralville, North Liberty, along with the community of Solon are also assessed to differentiate the city-level values versus county-wide values.

The analysis relies on an input-output model (I-O) of the Johnson county economy. I-O models are detailed, county-level accountings of the transactions that occur among industries, institutions, and households. By tracking the industrial transactions, I can measure the effects of growth, decline, or a reconfiguration of critical variables in the local economy. In this case I am analyzing all of the commodities that are imported into the area, and I am asking a very straightforward question: What potentially happens to the local economy when you substitute 5 percent of your goods and commodity imports with goods and services produced locally?*

This report answers that question and is a community economics education service of the Department of Economics and the College of Agriculture at Iowa State University.

Basic Data and Adjustments

Table 1 demonstrates the dependence of the Johnson County economy on imported production inputs. This table lists the components of the \$8.44

* Imports are econometrically estimated based on the production characteristics of industries in the region of study, the consumption characteristics of households and institutions, and the distribution commodity suppliers in the region of study.

billion of industrial output in the region in 2004, the latest data available. Industrial output is analogous to sales, or more precisely, it is the market value of all goods and service produced in the region. In making those sales, the industries and governments in the region made \$3.49 billion in payments for production inputs and \$4.954 billion in payments to value added, \$3.174 billion of which were payments to labor (employees and sole proprietors).

Of its \$3.49 billion in production inputs, however, \$2.22 billion, or a full two-thirds, are estimated to have been purchased from suppliers from outside of the region. Those imports could have come from adjacent counties, the remainder the state, the remainder of the nation, or from other countries. No matter, if they didn't come from Johnson County, they are imports.

Table 1. Private Sector Industrial Accounts

Total Industrial Output	8,442.86
Imported Production Inputs	2,216.26
Locally-Supplied Production Inputs	1,272.30
Payments to Value Added	4,954.31
Employees Wages	3,174.16
Proprietor Incomes	305.74
Returns to Investors	1,221.25
Indirect Government Taxes and Charges	253.16

Amounts in \$ millions

There are two dimensions to the industrial imports and other spending that need to be mentioned here. First, the information in Table 1 reflects all industries in the region and therefore contains all agricultural production imports. As the region is an important agricultural producer and agricultural goods processor, the region-wide industrial imports statistics are influenced by farm-related industries. I assume, however, for this study, that agricultural land in the region is currently used efficiently and that no meaningful expansion in production is possible. So all oilseeds, grain farming, and livestock production imports have been removed from this assessment beginning with Table 3.

Second, and importantly, private sector purchases are not the only imports in the area. The regional economy is much larger than just its industries, which many people fail to realize. It is home to spending by households and institutions (governments, primarily) that receive income from sources from both outside and from within the area economy and are major consumers of regional goods and services. Those values are contained in Table 2.

According to this model of the regional economy, households and institutions imported an additional \$1.724 billion in goods and services from outside of the region. This brings the total imports into the region to \$3.94 billion.

Table 2. Total Import Purchases

Type of Import	Total Commodity Imports
Intermediate (Industry)	2,216.26
Household and Institutional	1,723.73
Total	3,939.99

Amounts in \$ millions

Were the region to realize an import substitution goal of 5 percent of that total product import value, it would stimulate, potentially, \$197 million in additional local sales. There is, however, an important catch: *Johnson County industries and households cannot make import-substituting regional purchases for goods and services in the short run if the industry that produces that commodity does not exist in the county economy.* And while it is possible to attract industries that do not exist in the region to produce import-substitutes, there are a host of specialized commodity imports that simply cannot, will not, or are otherwise highly unlikely to ever be produced in the region. As examples, the region imported \$171.3 million in refined petroleum products, \$121.8 million in automobiles and light truck manufactured goods that year (these are the annual values to the auto manufacturers, not car dealers), and \$81.54 million in diverse pharmaceuticals and medicines (all values are in producer prices, not retail). These are all imports from industries that do not exist in the region or in a form to meet import substitution needs. Oil refineries, automobile plants, or drug manufacturers are not likely to locate in the region simply to satisfy specific regional demand because regional demand and production thresholds are not sufficient enough to warrant a factory.

In order to make this estimation plausible, I need to determine which imported commodities could realistically be substituted by regional suppliers over a reasonable time horizon. Stated more directly: you can't import substitute if there is no local producer. That means that I had to match up the commodity imports with the list of industries that actually exist in the region.

Table 3 lists those values. Of the \$3.94 billion in total regional imports, \$2.51 billion, or 64 percent, are commodities for which a producing industry was in evidence in the regional economy (after excluding the aforementioned agricultural imports). Taking 5 percent of that last amount I get \$125.57 million in potential import substitutes in the region.

Table 3. Imports Produced Regionally by Type of Importing Sector

Imports	Intermediate	Household and Institutional	Total
Commodities Produced Regionally	1,363.17	1,148.31	2,511.48
Commodities not Produced Regionally	769.24	568.85	1,338.09
All Agricultural Commodity Imports	83.85	6.57	90.42
Total Commodity Imports	2,216.26	1,723.73	3,939.99

Amounts in \$ millions

The Impacts

Two separate input-output analyses were done: one for the intermediate imports – those that are demanded by industries in the region, and one for the household and institutional import demands. In each analysis I identified the top 20 commodity imports and used those 20 commodities to represent the potential economic impacts of all commodity substitutes. I proportionately adjusted each commodity's value so that the sum of the 20 chosen representative commodities for both sets of analysis represented our 5 percent total value, or \$125.57 million in import-substituted local sales.

Tables 4 through 6 detail the impacts. The format of the tables is identical: impacts are compiled first for Johnson County, and then an apportionment is made for the 4 represented cities combined. I first identify intermediate import substitutes (Table 4), household and institutional import substitutes (Table 5), and combined values (Table 6). In Table 4, the intermediate import substitutes, the apportioning factor for cities was the average of the number of firms in among them as a fraction of the total number of firms in the county and the amount of estimated retail and service sales in the cities as a fraction of the county total. The apportioning value for Table 5 was the average of the populations of cities divided by the population of Johnson County and the fraction of retail and service sales in cities compared to the county. Table 4 is weighted by business firms and total sales; Table 5 is weighted by population and total sales. Table 6 is simply the sum 4 and 5.

Some explanation of the kinds of economic values is in order. The first value is *output (or total industrial output)*. Output is analogous to gross sales.* *Labor income* is made up of the wages and salaries paid to workers and the normal returns to sole proprietors (farmers, shopkeepers, etc.).

* In the very important wholesale and retail sales categories, both important industries in this analysis, we calculate our impacts assuming "marginized" sales or "marginized" industrial output. Simply stated, the value of output in a region in the model is stated net of the cost of goods sold in these sectors leaving only payments to normal overhead and value added in the region as the value of output. Consequently, the output in these sectors in this modeling structure is much less than the amount that would have been declared by the firms as total sales.

Jobs represent the number of positions in an economy, not necessarily the number of workers as workers can have more than one job.

The tables also list four dimensions of economic impact. The *direct effects* refer to the import-substituting purchases (the 5 percent) that are made of the 20 representative industries in the model (there is a different set of representative industries for the intermediate estimates and for the household estimates). When I make import substituting purchases from these firms, they, in turn, require increments of inputs on their own. Those locally supplied inputs are called the *indirect effects*. When workers in the direct and the indirect industries receive their paychecks, they convert their labor incomes into household spending. This spending creates the *induced effects*. The sum of the direct, indirect, and induced effects is the *total economic effects* or economic impacts.

The table also lists *multipliers*. A multiplier is simply the ratio of the total economic effect or impact to the direct value – the total value divided by the direct value. An output multiplier of 1.30, for example, means that for every dollar’s worth of import substituted direct purchases in the region, an additional \$.30 in output is generated in the rest of the economy. A labor income multiplier of 1.40 means that for every dollar’s worth of labor income paid in the direct sector, an additional \$.40 in labor income is supported in the indirect and induced sectors of the regional economy. Finally, a jobs multiplier of 1.50 means that for every job in the direct sectors, 50/100^{ths} of a job is sustained in the remainder of the economy.

I first look at intermediate import substitutes in Table 4. Five percent of the regional total yielded \$68.2 million in potential direct import-substituting transactions. That would support \$20.7 million in direct incomes to 602 jobs. To produce those sales would require an additional \$15.3 million in locally-supplied inputs, paying 157 jobs \$4.6 million in labor income. As workers in the region converted their earnings into household spending, they would cause \$12.5 million in induced (or household) sales, yielding 154 more jobs and \$3.8 million in additional labor income to those induced workers. In all, import substitutes of intermediate goods and services could yield \$95.97 million in output in the area, \$29.1 million in labor incomes, and 914 jobs.

Table 4. Economic Impact of Intermediate Import Substitutes

Johnson County	Direct	Indirect	Induced	Total	Multiplier
Output*	68,158,354	15,340,003	12,471,681	95,970,038	1.41
Labor Income	20,681,524	4,600,848	3,778,771	29,061,143	1.41
Jobs	602.3	157.1	154.5	913.9	1.52
Cities	Direct	Indirect	Induced	Total	Multiplier
Output*	64,081,699	14,422,494	11,725,731	90,229,924	1.41
Labor Income	19,444,531	4,325,664	3,552,757	27,322,952	1.41
Jobs	566.3	147.7	145.3	859.2	1.52

* Retail and wholesale output represent margined values

Below the Johnson County values, I estimate the amounts that would accumulate to the combined city economies. In all, the economic impact to the cities would be \$90.2 million in combined output, and \$27.3 million in labor income to 859 jobs.

Table 5 gives the household and institutional import substitute values. Those entities would make \$57.42 million in direct, import-substituting purchases in the Johnson County area to achieve the 5 percent import substitution goal. In doing so they would support 413 direct sector jobs paying \$15.1 million in labor income. This change would require \$12.3 million in indirect inputs, supporting another 128 jobs and \$3.8 million in labor income in the supplying sectors. When workers spent their wages, they would add \$9.3 million in induced transactions into the economy, adding another 115 jobs and \$2.8 million in labor incomes. In total, this would generate an additional \$79.01 million in area-wide output, \$21.7 million in labor income, and 657 jobs. For the cities combined we get \$69.5 million in output, \$19.1 million in labor income, and 577.5 jobs.

Table 5. Economic Impact of Household and Institutional Import Substitutes

Johnson County	Direct	Indirect	Induced	Total	Multiplier
Output*	57,415,517	12,287,420	9,303,117	79,006,055	1.38
Labor Income	15,061,137	3,791,886	2,818,724	21,671,747	1.44
Jobs	413.0	128.4	115.2	656.6	1.59
Cities	Direct	Indirect	Induced	Total	Multiplier
Output*	50,496,820	10,806,759	8,182,071	69,485,650	1.38
Labor Income	13,246,237	3,334,955	2,479,062	19,060,253	1.44
Jobs	363.2	112.9	101.3	577.5	1.59

* Retail and wholesale output represent margined values

Table 6 combines the previous two tables. Were the region to fully realize a combined 5 percent import substitution goal in both industrial production and households and institutions, it would generate \$125.6 million in additional local direct industrial output, support almost 1,015 direct jobs making \$35.7 million in labor incomes. That enhanced local spending would spur another \$27.63 million in supplying sector industrial output, supporting 285.6 workers and \$8.4 million in incomes. Induced spending would increase by \$21.8 million in the region, and require another 270 jobs paying \$6.6 million in labor incomes. Total region-wide economic impacts would be \$174.98 million in output, \$50.7 million in labor incomes, and 1,570.5 jobs. Totals for the combined cities are \$159.72 million in output, \$46.4 million in labor incomes, and 1,437 jobs.

Table 6. Total Import Substitutes Economic Impacts

Johnson County	Direct	Indirect	Induced	Total	Multiplier
Output*	125,573,871	27,627,423	21,774,798	174,976,093	1.393
Labor Income	35,742,661	8,392,734	6,597,495	50,732,890	1.419
Jobs	1,015.3	285.5	269.7	1,570.5	1.547
Cities	Direct	Indirect	Induced	Total	Multiplier
Output*	114,578,519	25,229,253	19,907,802	159,715,575	1.394
Labor Income	32,690,767	7,660,620	6,031,818	46,383,205	1.419
Jobs	929.5	260.6	246.6	1,436.7	1.546

* Retail and wholesale output represent margined values

Discussion

These values represent the maximum amount of economic activity that could be expected to accrue to the region were the area to achieve the 5 percent import substitution goal given the current structure of the regional economy. Whether the 5 percent goal is realistic or not, however, is another matter.*

Businesses, institutions, and households increasingly make purchases from spatially diverse sources. These purchases may *or may not* be more efficient and cost effective. Changing behaviors to focus on local purchasing opportunities will necessarily require public education of both the opportunity for the purchases and the localized beneficial economic outcomes that might accrue. In particular, the message may require proponents to urge participants to actively trade-off actual or perceived efficiencies or conveniences for a higher level of regional economic activity, which has beneficial regional multipliers, even if they as industries or individuals might initially view themselves as being worse off, perhaps only marginally, for doing so.

This model is a simulation of how the regional economy is expected to react were the 5 percent goal achieved. If there is slack in the regional economy, as in excess production capacity or significant under-employment, income gains regionally ought to be realized, but some of the expected job gains might not as firms will produce more goods and services more efficiently. Similarly, and realistically, local purchases only make sense to individuals and businesses if they perceive that they are no worse off for the decision or if the trade-offs make sense to them both socially and economically. If local goods and services are more costly or are offered in

* The data in Table 4 through Table 6 represent a 5 percent import substitute assumption. These factors are fixed for the estimation year so adjustments can be made by factor adjustment. Were the region to have a goal of 2.5 percent import substitutes, for example, the values in those tables would merely be divided by two. Were it 10 percent, the values would be multiplied by two.

only limited selections, then the propensity to buy locally will diminish or not be realized in the first place. This model cannot adjust for these important considerations. The model is an accounting framework, not a behavioral model.

Notably, all categories of multipliers are generally moderate in this analysis. The reason is that linkages in the region contain access to a fairly wide range of industries as this is a metropolitan area. This model identified 196 industries in the region, compared to a statewide model that has 439 separate industrial categories. While there is a quite diverse mix of industries, the area still has a large amount of commodity imports. Enhanced local spending in this small metropolitan area does not yield the kind of economic impact benefits that would be the case in a much larger economy with a more diverse and rich set of industries, such as, for example, the Quad City area.

A buy local campaign can assist in boosting those linkages, but it will take time. That effort, in this particular county, would also be working with the quite robust urbanization and specialization forces that are already prominent in the area due to the area's considerable consolidation of retail trade. Unlike most medium sized trade centers in Iowa that are facing an uphill battle to retain their regional trade vibrancy, this region has seen its competitive share of statewide retail sales enhanced over the past decade.

Some people might mischaracterize this effort as merely an initiative designed to re-capture basic retail and services sales leakages, as they often appear to be the most visible sign to most people of commodity or service imports. First, regional retail and service sales leakages are not a major problem in the aggregate for the community owing to the strong concentration of consumer trade possibilities in the area. Second, consumers of this information need to be helped to be made aware that the scope of total imported commodities by industries, households, and institutions dwarfs simple retail sales leakages that local chambers of commerce or store merchants might lament. Much greater multipliers in a region usually accumulate when industries buy from one-another than if households simply buy from local retailers. This is especially true when industries are buying specialized commodity and service inputs from local suppliers, not just the margined wholesale goods. There are many categories of household purchases that are not "mere" sales, as well: high quality educational, legal, financial, and medical services are all categories of consumption that have strong linkage values with the regional economy.

This analysis considered two potentials: increased industrial purchases of locally supplied inputs, and increased household and institutional purchases of *all* goods and services that they import, not just retail sales. Retail sales substitutes are a relatively small fraction of the total. That said, retaining retail sales are important, and should not be discounted, but they are only part of an entire "buy local" campaign.

**Appendix: Top 25 Industrial Commodity Imports for Johnson County
– Dollar Amounts in Millions**

Petroleum refineries	103.607
Wholesale trade	97.078
Management of companies and enterprises	87.865
Real estate	82.739
Telecommunications	75.108
Paper and paperboard mills	64.515
Advertising and related services	52.578
Semiconductors and related device manufacturing	47.096
Plastics material and resin manufacturing	35.448
Nondepository credit intermediation and related a	33.819
Motor vehicle parts manufacturing	29.822
All other electronic component manufacturing	28.255
Securities- commodity contracts- investments	27.250
Management consulting services	27.080
Legal services	26.945
Truck transportation	26.557
Employment services	26.275
Paperboard container manufacturing	25.505
Monetary authorities and depository credit interme	24.345
Power generation and supply	23.613
Automotive equipment rental and leasing	21.951
Architectural and engineering services	21.836
Insurance carriers	21.580
Other computer peripheral equipment manufacturing	21.277
Pharmaceutical and medicine manufacturing	20.717

**Appendix: Top 25 Institutional Commodity Imports for Johnson
County – Dollar Amounts in Millions**

Automobile and light truck manufacturing	121.820
Wholesale trade	89.445
Petroleum refineries	67.704
Telecommunications	62.761
Pharmaceutical and medicine manufacturing	60.823
Real estate	56.936
Monetary authorities and depository credit interme	41.709
Cut and sew apparel manufacturing	41.261
Insurance carriers	38.798
Power generation and supply	38.469
Securities- commodity contracts- investments	30.800
Legal services	29.101
Natural gas distribution	28.514
Air transportation	27.878
Hospitals	22.513
Cable networks and program distribution	19.418
Software publishers	17.992
Food services and drinking places	17.060
Automotive equipment rental and leasing	16.194
Automotive repair and maintenance- except car wash	15.556
Other amusement- gambling- and recreation industri	15.459
Business support services	15.388
Noncomparable imports	14.791
Offices of physicians- dentists- and other health	14.756
Scientific research and development services	14.728
Soft drink and ice manufacturing	14.458