

Export Promotion/Import Replacement Strategies

Final Report

For

**Chicago Metropolitan Agency for Planning
(CMAP)**

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A note about this paper:

RCF Economic and Financial Consulting prepared this report with recommendations on this topic for consideration in the *GO TO 2040* plan. The intent is to assist CMAP as it incorporates policies, investments, and other actions to move us towards our regional vision. This report is meant to gather background information, clarify issues, conduct numerical analysis, and present potential recommendations for CMAP's consideration. This report contains the opinions of the authors, and does not represent CMAP policy.

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1. Introduction and Acknowledgements

This report is one in a series of reports sponsored by CMAP as part of the Go To 2040 project. This report examines the possibilities for export promotion and import substitution for the metropolitan economy. Major export industries are identified, and suggestions for export promotion are provided. Targets of opportunity for the replacement of imports used by local export firms in their production processes are also identified. However, a word of caution is appropriate. Both export promotion and import replacement are based on the idea that firms in the Chicago area can sell more of the goods and services that they offer. Customers for additional exports are located outside the metropolitan area, and import replacement involves selling more to customers located within the area. There may be very good reasons why these sales are not being made at this time; goods and services offered may not fit customer needs, and so on. Successful pursuit of this general strategy may require changes in the nature of the goods and services that are offered as well as changes in marketing plans and techniques. RCF recommends that, should a program of export promotion and/or import replacement be undertaken, it should be as part of a comprehensive economic development strategy, and not as an isolated policy.

Hewings, et al. found evidence of a “hollowing out” of the Chicago economy¹. The idea is that, because the costs of transportation and communication have declined, it is increasingly possible to have production stages in a value chain located in different places – when once they were vertically integrated in one metropolitan area or region. Establishments within a metropolitan area or state are trading more with establishments

¹ G. Hewings, M. Sonis, M. Guo, P. Israilevich, and G. Schindler, “The Hollowing Out Process in the Chicago Economy, 1975-2015,” *Geographical Analysis* 30 (1998), pp. 217-233.

in other locations and less with local establishments. This trend causes local multiplier effects to be smaller and feedback effects from other locations to be larger. For example, Hewings shows that interstate flows of commodities have grown faster than have domestic product during the 1993-2002 period². A continuation of this trend would suggest that there will be increasing opportunities to export intermediate goods and services from metropolitan Chicago, but that it may become increasingly difficult to substitute imports of intermediate inputs. An empirical finding related to this last point is that inter-zonal trade flows of goods and services within the Chicago metropolitan area are relatively small³. Inter-zonal flows of consumer expenditures and incomes earned by commuters are far larger.

An export promotion - import substitution strategy is followed by some major metropolitan areas. This strategy usually involves selection of a “target” sector of the economy for a comprehensive economic development program. One instructive example is biotechnology in Singapore, as described by Yusuf and Nabeshima in their book *Postindustrial East Asian Cities: Innovation for Growth* (Stanford University Press, 2006). Yusuf and Nabeshima suggest that target industries should be selected on the basis of seven criteria:

- Input requirements should conform to available supplies,
- The industry should produce exportable goods or services, with substantial potential for demand growth (i.e., exports to be promoted),
- The industry should be knowledge or technology intensive,

² G. Hewings, “On Some Conundra in Regional Science,” *Annals of Regional Science* 42 (2008), pp. 251-265. See also G. Hewings and J. Parr, “The Changing Structure of Trade and Interdependence in a Mature Economy: The U.S. Midwest,” in P. McCann, ed., *Technological Change and Mature Industrial Regions: Firms, Knowledge, and Policy* (Cheltenham, U.K.: Edward Elgar), 2008; G. Hewings and J. Parr, “Spatial

- Because of its technology intensity, the industry relies heavily on the skills of workers,
- The industry has substantial backward and forward linkages in the local economy,
- The industry has large employment potential, and
- The industry has proven business models to guide new firms and experienced firms that can serve as guides.

The biotechnology industry in Singapore meets these criteria. The local officials (the Singapore Economic Development Board) are developing an entire sector of the local economy, including biotechnology, pharmaceuticals, medical devices, health care services, and bioinformatics. Land was set aside for the sector near the National University of Singapore and its medical facilities. The idea is to promote this export sector, and to develop a cluster of related industries (i.e., import substitution, in the sense that the related industries provide intermediate inputs for other industries in the cluster). The overall plan includes efforts to attract star scientists and major pharmaceutical and biotechnology firms to Singapore, and also to market its existing health care facilities to its larger region in Asia. The strategy also includes planning for the needed workforce and supplementing private venture capital with public funds. The report “What Makes Regions Grow” provides additional discussion of alternative comprehensive economic development strategies.

This report could not have been completed without the cooperation of Professor Geoffrey Hewings and the staff of the Regional Economics Applications Laboratory

Interdependence in a Metropolitan Setting,” *Spatial Economic Analysis* 2 (2007), pp. 7-22.

³ G. Hewings and J. Parr, *op. cit.*

(REAL) at the University of Illinois at Urbana-Champaign. Professor Hewings and Dr. Donald Jones also provided valuable comments on an earlier draft of this report.

2. Executive Summary

The purpose of this report is to explore the possibilities for export promotion and import replacement as economic development strategies for metropolitan Chicago. The economic success of a metropolitan area depends upon the demands for its exports to purchasers outside the metropolitan area, and upon its ability to supply goods and services to its customers and to itself.

This report identifies the 13 the most important export industries in metropolitan Chicago, and then reports on simulation studies that indicate which of these industries have exports that have the greatest impact on the local Gross Regional Product at the margin. Appendix B provides details on these 13 sectors, including lists of some of the metropolitan area's leading firms in each. Six industries are identified as having the greatest local "multiplier" effect, and they are:

Chemicals and Allied Products (including Pharmaceuticals)

Industrial Machinery and Equipment

Computer and Other Electric Equipment

Wholesale Trade

Air Transportation

Finance and Insurance

It perhaps comes as no surprise that this list of industries reads like a "who's who" in the local economy. The report suggests that efforts to promote the exports of these industries might be considered.

The report then turns to the replacement of imports that are intermediate inputs into local production. The research concentrates on the 13 major export sectors, and

investigates whether local firms are failing to purchase major intermediate inputs from other local firms. The chief finding is that four of the major export industries purchase very little of the needed Professional and Management Services from local sources, and that a sizable increase in those purchases would have a large impact on the local Gross Regional Product. Other import substitution possibilities are identified as well. But a word of caution is in order. This report identified possible opportunities for import substitution, but there may be very good reasons for why those goods and services are imported; it may be very costly for them to be produced locally. Import substitution efforts have a very mixed record in less developed countries. One sensible rule is that the supplier industry must already exist and be thriving in the urban area. This report uses this rule to make suggestions for possible import substitution opportunities.

The report notes that the promotion of key export sectors will depend upon basic and advanced education and training facilities, creation of innovations, and transportation and other infrastructure. The report also suggests expansion of the Illinois Department of Commerce and Economic Opportunity International Trade Centers to include exports to domestic (inside the U.S.) customers, or the creation of a Chicago Export Bureau that might be modeled on the Chicago Convention and Tourism Bureau. Such a new Bureau might also be responsible for promoting the use of locally-supplied Professional and Management Services by local firms.

3. Existing Conditions

3.A. The Issue: Export Promotion and Import Replacement

3.A.1 Basic Theory of Exports and Imports for a Metropolitan Area

The economy of a metropolitan area is based on its ability to supply goods and services that are in demand by households, firms, and governmental bodies located outside the metropolitan area. A local economy is driven by the demand for its exports (to the rest of the U.S. and to the rest of world), and by the characteristics of its “supply side.” Demand for exports has a larger impact on a local economy if that local economy supplies a higher proportion of the value embodied in the good or service that is exported. This report examines the economy of metropolitan Chicago from both the demand and supply sides. What are the major export industries? How much “local content” is embodied in those exports?

A local economy also depends upon the extent to which it can provide goods and services for its own use. Does the local economy import most of what is consumed, or is local production able to supply most of local demand?

Export promotion consists of activities that increase the demand by households, firms, and governmental bodies outside the metropolitan area for goods and services produced locally. Import replacement policies are of two types: those that increase the local content of exports, and those that increase the purchases of locally-produced final goods and services by local households. The appendix to this report provides a numerical example of an input-output model that illustrates these points.

3.A.2 Exports from Metropolitan Chicago

Metropolitan Chicago supplies a wide range of exported goods and services. The

Chicago Regional Economic Impact Model (CREIM) provides estimates of exports by industry category for 2007 for the seven-county metropolitan area. This report relies on CREIM because it is the most detailed model available for the metropolitan area.

Professor Hewings commented that attempts to measure exports from a metropolitan area should be viewed with caution. It is possible that export and import flows are greater than reported in CREIM because it is difficult to measure the “cross-hauling” of similar goods and services. Table 1 shows the estimated value of exports for each industry. The table also shows the total output, employment for each industry, local value added for each industry (payments to local primary inputs labor, capital, and land). Table 1 also shows the NAICS code(s) for each CREIM sector.

Table 1
Exports Produced by Local Resources: CREIM Sectors

CREIM Industry/ (NAICS Code)	Exports	Total Demand	Employment	Local Value Added
1. Livestock & Other Ag. Products (111,112)	\$3,891 m.	\$6,213 m.	5,865	\$6,103 m.
2. Agriculture, Forestry, Fish. (113,114,115)	268	299	64,382	260
3. Mining (21)	167	2,521	4,888	1,430
4. Utilities (22)	20	7,767	18,906	6,753
5. Construction (23)	1,246	35,225	263,289	24,543
6. Food & Kindred Products (311)	8,976	26,417	41,930	18,197
7. Tobacco Products (312)	81	310	248	---
8. Apparel & Textiles (313,314,315)	867	921	8,001	552
9. Leather & Leather Products (316)	59	116	694	62
10. Lumber & Wood (321)	30	820	4,716	615

CREIM Industry/ (NAICS Code)	Exports	Total Demand	Employment	Local Value Added
11. Paper & Allied Products (322)	5,283	5,350	17,062	3,521
12. Printing & Publishing (323,511,516)	12,409	17,315	50,909	13,888
13. Petroleum & Coal Products (324)	1,443	20,347	4,759	16,464
14. Chemicals & Allied Products (325)	9,660	23,852	38,813	10,115
15. Rubber & Plastics (326)	3,621	8,825	32,640	6,148
16. Stone, Clay, Glass (327)	2,510	2,541	9,320	1,707
17. Primary Metals (331)	5,662	6,204	16,739	4,776
18. Fabricated Metals (332)	13,436	13,914	56,720	10,440
19. Industrial Machinery & Equipment (333)	5,141	9,742	55,827	6,584
20. Computers & Other Elec. Products (334,335)	10,498	20,184	77,066	13,748
21. Transportation Equipment (336)	5,102	6,728	16,074	4,632
22. Furniture (337)	64	1,894	8,706	1,386
23. Misc. Manuf. (339)	4,718	7,374	13,785	5,658
24. Wholesale Trade (42)	18,291	46,265	244,331	35,465
25. Retail Trade (44,45)	2,088	34,513	711,012	27,472
26. Air Transportation (481)	5,646	6,781	63,998	3,275
27. Railroad Transp. & Services (482,492,487,488)	3,598	11,441	37,655	9,054
28. Water Transp. (483)	36	197	1,938	---
29. Truck Transp. & Wareh. (484,493,562)	2,516	10,791	52,293	5,985
30. Transit (485)	458	1,227	16,093	809
31. Pipeline Transp. (486)	5	493	197	367
32. Information	11,097	22,873	38,156	16,975

CREIM Industry/ (NAICS Code)	Exports	Total Demand	Employment	Local Value Added
(515,517)				
33. Motion Picture & Sound (512)	120	1,622	19,727	885
34. Finance & Insurance (52,55,533)	32,787	71,855	466,674	27,535
35. Real Estate Leasing & Brokers (531)	18,321	39,857	92,757	32,513
36. Prof. & Mgmt. Services (54,518,561)	47,263	96,053	724,250	92,841
37. Educational Services (61)	2,400	7,778	125,179	5,808
38. Health Care (621,622,623)	2,110	34,179	398,474	25,460
39. Social Assistance (624)	0	3,131	92,984	2,068
40. Arts, Entertainment, Rec. (711,713)	563	6,187	62,445	4,700
41. Accommodation Services (721)	411	3,878	57,547	3,050
42. Food Services (722)	1,548	13,862	262,532	8,648
43. Repair & Maintenance (811)	633	7,457	78,949	6,138
44. Personal Services (812)	1,019	4,421	58,066	2,790
45. M'ship Org. & HH Workers (712,813,814)	1,830	6,693	148,064	5,126

The leading export industries are Professional and Management Services, Finance and Insurance, Real Estate Leasing and Broker Services, Wholesale Trade, Fabricated Metal Products, Printing and Publishing, and Computer and Other Electronic Products. We extract from Table 1 the industries that exported at least \$5 billion for more detailed analysis.

Manufacturing Exports

Metropolitan Chicago has seven manufacturing industries with a value of exports

that exceeds \$5 billion per year. These seven industries are a diverse group of nondurable and durable goods, as follows (listed with the percentage of total output that is exported outside the metropolitan area):

- 6. Food and Kindred Products 34.0% exported
- 12. Printing and Publishing 71.7%
- 14. Chemicals and Allied Products 40.5%
- 18. Fabricated Metals 96.6%
- 19. Industrial Machinery and Equipment 52.8%
- 20. Computer and Other Electrical Products 52.0%
- 21. Transportation Equipment 75.8%

As one might have expected, Food and Kindred Products exports a lower percentage of its total output than do the other industries – much of that output is consumed locally. Exports are at least 70% of the output of the Printing and Publishing, Fabricated Metals, and Transportation Equipment industries. Together these seven industries exported \$65.2 billion in output produced by local resources in 2007.

Data on manufacturing exports from the Chicago metropolitan area to foreign countries are provided by the U.S. Department of Commerce, Office of Trade and Industry Information. They define the metro area as including Gary, IN and Kenosha, WI, so their definition is broader than the seven-county metro area that is being studied in this report. Total goods exports to foreign countries were \$29.2 billion in 2007, and the leading export industries (with NAICS codes) are:

325, Chemicals and Allied Products	\$6.14 billion
334, Computer and Electronic Products	\$5.16 billion

333, Industrial Machinery	\$3.41 billion
336, Transportation Equipment	\$3.18 billion
335, Electrical Equipment, Appliances, Components	\$1.71 billion

These data are consistent with the data from CREIM listed above. NAICS industries 325, 333, and 336 are identical to CREIM sectors 14, 19, and 21, and NAICS industries 334 and 335 combined are CREIM sector 20. The data confirm that much of the manufacturing exports from the Chicago area have become “high tech” business.

Exports of Services

Six service sectors exported more than \$5 billion in services in 2007, including the top four export sectors for the metropolitan area. Together these sectors exported \$133.4 billion in output in 2007. These six are discussed briefly in order of the value of exports of output from local resources.

Professional and Management Services

The large sector employed 724,250 in 2007, and exported 49.2% of its total output of \$96.05 billion. Output per employee is \$132,666, and each employee on average produced \$65,280 in exports. Local value added is a very high 96.7% of total output. The industry consists of

- Legal services,
- Accounting services,
- Architectural and engineering services,
- Computer systems design services,
- Management, scientific, and technical consulting,
- Scientific research services,

- Advertising,
- Internet service providers,
- Administrative support services, including temporary help, and
- A few other services.

Finance and Insurance

There are 466,674 workers in this industry with output of \$71.86 billion, which is \$153,876 per worker. The industry exported 45.6% of its output, which is \$70,257 per worker. Local value added is 81.6 % of total output produced using local resources.

Real Estate Leasing and Brokerage

This industry consists of lessors of real estate, offices of real estate agents and brokers, and other activities related to real estate such as appraisers and property managers. This industry is a major export industry for the metropolitan area with \$18.3 billion in output. Almost half (46.0%) of its output is exported. This may be surprising, but Chicago is home to several major national real estate firms such as Equity Residential REIT. Employment in the industry is 92,757.

Wholesale Trade

Wholesale trade is big business in the metropolitan area with \$18.3 billion in exports. This amount represents 39.5% of the total value of output. This industry employed 244,331 in 2007.

Information

This industry consists of Broadcasting and Telecommunications (wired, wireless, satellite, cable, and so on). This is another major export industry, with \$11.1 billion in exports. The industry exports almost half (48.5%) of its total output.

Air Transportation

The last industry in the group of major service exporters is Air Transportation. This industry exports 83.1% of its output - a very high percentage. Exports of output were \$5.6 billion in 2006.

Export Promotion Policy

The Chicago Convention and Tourism Bureau is an organization devoted to the marketing and promotion of conventions and tourism in the Chicago area. This agency carries on important work that is widely regarded as successful. Conventions and tourism are, in effect, exports of services from the metropolitan area to visitors who largely are drawn from the rest of the U.S. Visitors spend money on hotels, restaurants, cabs, and so on, and pay admission fees to various attractions. Perhaps the work of the Chicago Convention and Tourism Bureau can serve as a model for other export promotion activities.

The Illinois Department of Commerce and Economic Opportunity (DCEO) operates the Office of Trade and Investment and a network of International Trade Centers and NAFTA Opportunity Centers in the state. It has a managing director and a professional staff of 11, seven of whom have the title of international trade specialist. There are two international trade specialists assigned to Asia, and one each to Europe and Russia, Mexico, The Americas, Middle East, and Africa. International Trade Centers in the metropolitan area are located at NORBIC (5353 W. Armstrong Ave., Chicago) and the College of DuPage (425 22nd St., Glen Ellyn). NORBIC also provides the NAFTA Opportunity Center for the metropolitan area. The web site for the Office of Trade and Investment states that the purpose of the program is to promote manufacturing exports to

foreign countries. It appears that this state program does not include efforts to promote exports to the rest of the U.S. or efforts to promote the export of services.

The work of the Office of Trade and Investment primarily is to provide information - information about Illinois products to foreign customers, information about foreign opportunities to Illinois manufacturers, and information about the steps necessary to engage in foreign trade. As noted above, the staff is organized by geography rather than by industry. This permits staff members to specialize in certain countries (each with its own set of laws and cultural norms) and to make marketing and information-gathering trips. One might question whether the Office also might include industry specialists who would possess detailed knowledge of products and processes. As noted above, RCF suggests that the Office might be expanded (and renamed) to promote exports of services and well as manufactures, and to target customers in the U.S. as well as abroad. If this suggestion is followed, it would seem that an expansion of staff should include industry specialists.

World Business Chicago is another prominent organization. WBC is a not-for-profit economic development corporation that "... fosters the Chicago region's global position as a thriving business location." The mission of WBC is as follows:

"WBC coordinates the city's business retention and attraction efforts, raises Chicago's profile as a prime business location, and serves as a resource for companies. The staff navigates the site selection process for businesses by providing economic and industry data, site location assistance, state and local

incentive information, and bringing together key parties in the public and private sectors to spur and accelerate economic growth.”⁴

WBC does not promote exports, but it is possible that its work may lead to replacement of imports.

3.A.3 Imports

Urban areas import large amounts of final goods and services, and also import inputs into the production of goods and services that are used locally or exported. Most industries purchase intermediate inputs from many industries. CREIM does not provide data on the imports of final goods and services. However, the model does indicate the amounts of local intermediate inputs used in the production of goods and services in all of the sectors listed above in Table 1. A comparison of these input coefficients with the similar input coefficients for the industry at the national level indicates whether the local industry imports a great deal or relatively small amounts of the key intermediate inputs.

The procedure used is to determine, for Chicago’s 13 major export industries, the most important intermediate inputs for these industries at the national level. An intermediate input is considered to be important if it contributes at least 5% to the total value of the output. The next step is to consult the input-output table in CREIM to determine whether locally-produced intermediate inputs are being used at a rate that is at least 70% of the national average figure.

For example, the local Food and Kindred Products industry purchases inputs from the following local industries:

Livestock and Other Agricultural Products	4.9%
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⁴ “About US: World Business Chicago,” <http://www.worldbusinesschicago.com/tabid/67/Default.aspx> (Accessed June 30, 2009).

Food and Kindred Products	11.0%
Rubber and Misc. Plastics	1.0%
Wholesale Trade	4.5%
Railroad Transportation	0.9%
Truck Transportation	1.7%
Finance and Insurance	2.0%
Professional and Management Services	1.9%

The industry also purchases very small amounts of inputs from all 37 sectors of the local economy.

Purchases of inputs from other firms in the Food and Kindred Products industry is the largest component of intermediate inputs. The intermediate input coefficient at the national level is 10.1%. The Food and Kindred Products industry in metropolitan Chicago purchases 11.0% of the value of its output from firms in the local industry. Therefore, in this case, the local Food and Kindred Products industry is purchasing its most important intermediate inputs from local sources at a rate that matches the national input-output coefficient. It is therefore not likely that there are significant amounts of imports of intermediate inputs to be “replaced” in this industry.

In contrast, Paper and Allied Products are major inputs (6.2%) into the national Printing and Publishing industry. However, the local Printing and Publishing industry purchases no (0.00%) of its paper and allied products from local sources. Can the importation of paper and allied products be changed? If it can be changed, what will be the effects on the local economy? Printing and Publishing industry also makes extensive use of inputs provided by other firms in the same industry and inputs of Professional and

Management Services (see Table 2 below). These are industries that exist on a large scale in the metropolitan area, and represent possible opportunities for import substitution, as explained below.

The results of this investigation of intermediate inputs for the seven manufacturing export industries is shown in Table 2, and Table 3 shows the results for the six service export industries.

Table 2
Major Intermediate Inputs for Chicago's Manufacturing Export Industries

Export Industry	Intermediate Input	U.S. Input Coefficient	Chicago Input Coefficient	Ratio: Chicago /US
6. Food Products	6. Food Prod.	.101	.110	1.09
12. Printing & Publ.	11. Paper	.062	.000	0.00 *
	12. Print. & Pub.	.084	.021	0.25 *
	36. Prof. Serv.	.108	.064	0.59 *
14. Chemicals	14. Chemicals	.238	.208	0.87
	24. Wholesale Tr.	.052	.055	1.06
	34. Finance & Ins.	.054	.049	0.91
18. Fabr. Metals	17. Prim. Metals	.206	.014	0.07
	18. Fabr. Metals	.101	.005	0.05 *
	24. Wholesale Tr.	.054	.049	0.91
19. Ind. Machinery	17. Prim. Metals	.112	.007	0.06
	18. Fabr. Metals	.090	.005	0.06 *
	19. Ind. Mach.	.078	.048	0.62 *
	24. Wholesale Tr.	.066	.067	1.02
20. Computer Equip.	20. Comp. Eq.	.165	.100	0.61 *
	24. Wholesale Tr.	.063	.037	0.59 *
	34. Fin. & Ins.	.070	0.72	0.97
	36. Prof. Serv.	.066	.031	0.47 *
21. Transp. Equip.	17. Prim. Metals	.072	.005	0.07
	21. Transp. Equip.	.241	.037	0.15 *

* Indicates possible target of opportunity for import replacement.

Table 2 reveals some important patterns for Chicago's manufacturing exporters. Two industries (Food Products and Chemicals and Allied Products) purchase

intermediate inputs for local sources that match the national input coefficients. However, purchases of at least one intermediate input from local sources fall short of the national norm for the other five industries. Consider each industry in turn.

The local Printing and Publishing industry purchases no paper from local sources, and purchases very little (25% of the national norm) from other local firms in the same industry. In addition, purchases of Professional Services from local sources are 59% of the national norm. The local Paper and Allied Products industry employed 17,062 people in 2007 and had a value of output produced using local resources of \$6.2 billion. As noted above, the local Printing and Publishing industry employed 50,909 in that year, and the huge local Professional Services industry supplies a wide range of services to business. The basic idea is that the local Printing and Publishing industry possibly presents a business opportunity for these three local sectors - Paper and Allied Products, Printing and Publishing itself, and Professional and Management Services..

The Fabricated Metals industry makes extensive use of inputs from Primary Metals and from other parts of the Fabricated Metals industry, but *very* little of these inputs are supplied to Chicago's local industry from local sources. Of course, Northwest Indiana is one of the nation's major sources for Primary Metals (and Chicago has lost most of its Primary Metals industry), so there may be little point in attempting to pursue and import-replacement strategy in this case. However, it is not clear why the local Fabricated Metals firms do not purchase inputs from each other. This appears to be a significant possibility for import substitution. In contrast, the local industry uses the local Wholesale Trade industry at the national norm.

Similarly, the local Industrial Machinery and Equipment industry purchases virtually no intermediate inputs from the local Primary Metals and Fabricated Metals industries. This appears to be another possible opportunity for local Fabricated Metals. Furthermore, the local Industry Machinery and Equipment industry makes purchases from itself that fall below the national norm. As with other industries, purchases of services from the local Wholesale Trade industry match the national norm.

Computer and Other Electric Products represent another possible target of opportunity for local firms – in this case for itself and for Finance and Insurance and Professional Services. The local input coefficients are 47% to 61% of the national norm.

Lastly, as is the case for other industries, the local Transportation Equipment industry purchases very little from the local Primary Metals industry. The possible target of opportunity is the purchase of intermediate inputs from firms in the same local industry. Are local firms missing an opportunity to supply parts and other components?

The corresponding analysis for the six service export industries shown in Table 3 indicates that there may be targets of opportunity for the local Professional and Management Services industry to provide its services to the local Air Transportation and Information industries. Purchases of local services by the local Information industry from itself and the Finance and Insurance industry also fall short of the national norm. Perhaps the most surprising result is the lack of purchases of the local Professional and Management Services industry from other local firms in the same industry. The local input coefficient is only 11% of the national norm.

Table 3
Major Intermediate Inputs for Chicago’s Service Export Industries

Export Industry	Intermediate Input	U.S. Input Coefficient	Chicago Input Coefficient	Ratio: Chicago/US
24. Wholesale Trade	34. Finance & Ins.	.056	.047	0.84
	36. Prof. Serv.	.071	.052	0.73
26. Air Transp.	13. Petroleum	.195	.248	1.27
	27. Railroad	.075	.079	1.05
	36. Prof. Serv.	.098	.028	0.28 *
32. Information	32. Information	.217	.104	0.48 *
	34. Finance & Ins.	.061	.029	0.48 *
	36. Prof. Serv.	.105	.049	0.47 *
34. Finance & Ins.	34. Finance & Ins.	.240	.176	0.73
	36. Prof. Serv.	.073	.188	2.57
35. Real Estate	34. Finance & Ins.	.057	.040	0.70
36. Prof. Services	36. Prof. Serv.	.131	.015	0.11 *

* Indicates possible target of opportunity.

Import Replacement Policy

Does the metropolitan area have any programs that target import replacement in the sense it is discussed in the previous section? RCF finds that the simple answer is “no.” RCF is not aware of any efforts to encourage local firms to purchase inputs from other local firms. World Business Chicago concentrates on attracting firms to the city of Chicago, but there appears to be no particular emphasis on attracting firms that would replace imported intermediate inputs. Indeed, business attraction is difficult enough without adding other objectives to the program. RCF suggests that a missing element that may be productive is encouraging local firms to purchase inputs from other local firms (and for local firms to investigate whether sales can be made to other local firms).

3.B. Challenges and Opportunities for Export Promotion and Import Replacement

3.B.1 Export Promotion: Beyond Promoting Manufacturing Exports to Foreign Countries

A basic fact is that at least 75% of exports from the Chicago metropolitan area are to other locations in the U.S.⁵ Professor Hewings has shown that interregional trade in the US has expanded rapidly, and that the Chicago area has benefited from this trend.⁶ The other states of the Midwest are the Chicago area's largest trading partners, so the economic future of the metropolitan area is tied up with the economic future of the Midwest. As noted above, the State of Illinois has an agency that promotes the exports of local manufactured products to foreign countries. This program assists firms with the complexities of doing business in foreign countries, so a useful service is being provided. Presumably the State of Illinois has no program to promote exports to the rest of the U.S. because it is thought that the marketing efforts of local firms are doing what can be done. Clearly the design and implementation of a program to promote exports of both goods and services to the rest of the U.S. (and of services to foreign countries as well) represents a large challenge, but it also may be a significant opportunity that has been missed. A possible follow-up to this research would be to investigate how other metropolitan areas tackle this issue. A local example is the Chicago Convention and Tourism Bureau, an agency that promotes an "export," namely services to conventioners and tourists.

The purpose of this section is to present empirical estimates of the impact on the local economy of expanding exports in the 13 export industries identified in the previous section of the report. This investigation provides one basis for "targeting" export

⁵ The U.S. Dept. of Commerce, Office of Trade and Industry Information, reports that total exports of goods from the larger metropolitan area (including Gary, IN and Kenosha, WI) were \$29.2 billion in 2006. Total exports of goods from the smaller 7-county Chicago metro area were \$95.2 billion in 2007, according to data provided as part of CREIM.

⁶ G. Hewings, "On Some Conundra in Regional Science," *Annals of Regional Science* 42 (2008), pp. 251-265.

marketing and other efforts to obtain the largest effect. CREIM is used to simulate the effect of a \$1 billion increase in export sales for each industry. The increase studied is an increase in the sales of that industry to purchasers outside the seven-county metro area – which is different from a \$1 billion increase in exports produced by local resources. The effects on Gross Regional Product (GRP) are shown in Table 4. GRP is the value of output produced by the local primary inputs – labor, capital and land. It is the best overall measure of the value of output. GRP for the metropolitan is estimated to have been \$295.24 billion in 2007. Total employment in that year was 4.85 million, so GRP per employed person was \$60,875. On average an increase in GRP of \$1 billion would mean that 16,430 more people are employed.

Table 4
Impact of One Billion Dollar Increase in Exports
On Gross Regional Product

Export Industry	Increase in Gross Regional Product	Percentage Change in GRP
Manufacturing Industries		
6. Food & Kindred Products	\$426 m.	0.144
12. Printing & Publishing	\$538 m.	0.182
14. Chemicals & Allied Products	\$790 m.	0.268
18. Fabricated Metals	\$672 m.	0.228
19. Industrial Machinery & Equipment	\$1,072 m.	0.363
20. Computer & Other Elec. Products	\$858 m.	0.291
21. Transportation Equipment	\$646 m.	0.219
Service Sectors		
24. Wholesale Trade	\$887 m.	0.300
26. Air Transportation	\$1,067 m.	0.361
32. Information	\$485 m.	0.164
34. Finance and Insurance	\$1,005 m.	0.330
35. Real Estate	\$437 m.	0.148
36. Prof. and Management Services	\$432 m.	0.147

Three industries stand out in this exercise in that a \$1 billion increase in export sales generates more than a \$1 billion increase in GRP: Industrial Machinery and

Equipment, Air Transportation, and Finance and Insurance. The other industries that generate about \$800 million or more increase in GRP are Chemicals and Allied Products, Computer and Other Electric Products, and Wholesale Trade. Consider these industries in turn.

The Industrial Machinery and Equipment industry, along with the Computer and Electric Products industry, comprise a cluster of industries that specializes in complex gear needed in the modern high-tech economy. (Obviously Motorola is included in the Computer and Electric Products industry.) These two industries employed 133,000 people in 2007 (Table 1). As shown above, these two industries do not purchase intermediate inputs from each other to a large extent, but it is possible that they share aspects of the primary inputs – principally skilled labor. A more detailed list of the component parts of these industries is as follows:

19. Industrial Machinery and Equipment

Agriculture, construction, and mining equipment

Industrial machinery

Commercial and service industry machinery

HVAC and commercial refrigeration equipment

Metalworking machinery

Engine, turbine, and power transmission equipment

Other (pumps, compressors, power hand tools, etc.)

20. Computer and Other Electric Products

Computer and peripheral equipment

Audio, video, and communications equipment

Semiconductor and other electronic components

Electronic instruments

Manufacturing and reproducing magnetic and optical media

Electric lighting equipment

Household appliances

Electrical equipment (power distribution, switchboards, relay)

Other electrical equipment (storage battery, cable and wire, etc.)

Air Transportation is big business in the metropolitan area, and the modernization of Midway Airport, coupled with the major expansion and modernization of O'Hare Airport, provides the airport infrastructure to maintain and, in the longer run, expand this local industry. O'Hare Airport, with its direct flights to most destinations, also plays a critical part in making Chicago emerge as a world-class city. The importance of this industry to the local economy is amplified by the finding that an expansion of its sales to purchasers outside the metropolitan area will have a large impact on local GRP.

Chicago is a world leader in certain aspects of Finance and Insurance – in particular the futures and options markets and in insurance services, and this very large sector (employment of 460,000) is the second-largest export sector in the Chicago economy. It is a big, important sector with a large impact on the local economy at the margin.

Chemical and Allied Products include pharmaceutical products, a sector that has a large presence in the Chicago area. The components of the industry are:

- Basic chemical manufacturing
- Resin, rubber, and artificial fibers

- Agricultural chemicals
- Pharmaceutical and medicine
- Paint, coating, and adhesive
- Soap, cleaning compound, and toiletry
- Other (ink, and so on).

The report on Innovation and Industry Clusters emphasizes the importance of the health care cluster, including pharmaceuticals, to the local economy. The finding that the exports of this industry have a large impact on local GRP highlights its importance.

Chicago's status as a center for Wholesale Trade is related to its position in the national transportation system. The future of this sector depends upon maintenance of and improvement in the quality of Chicago's freight facilities (air, rail, and truck). The report on Infrastructure, and other reports that are part of the Go To 2040 project, discuss this matter in depth.

This section has examined the results of the simulated effects of an increase in exports on local GRP for the 13 largest export industries – one measure of the benefit side of export promotion. Six of those industries are highlighted, but this does not mean that the other 7 industries are not good targets for export promotion activities. An export promotion strategy must consider both costs and benefits.

3.B.2. Import Replacement: Modification of the Inter-Industry Matrix

The data on inter-industry purchases in Tables 2 and 3 above led to the identification of selected targets of opportunity for import replacement. Those possible targets are:

Export Industry	Supplier Industry
Manufacturing	
12. Printing and publishing	11. Paper & allied products
	12. Printing and publishing
	36. Prof. and mgmt. services
18. Fabricated metals	18. Fabricated metals
19. Industrial mach. & equip.	17. Fabricated metals
	19. Industrial mach. & equip.
20. Computer & other elec.	20. Computer & other elec.
	34. Finance & ins.
	36. Prof. & mgmt. services
21. Transp. equipment	21. Transp. equipment
Services	
26. Air transportation	36. Prof. & mgmt. services
32. Information	32. Information
	34. Finance & ins.
	36. Prof. & mgmt. services
36. Prof. & mgmt. services	36. Prof. & mgmt. services

This list forms the basis of a series of CREIM simulations. Interindustry input coefficients are increased to the national coefficients for this list of supplier industries, and the increase in GRP is computed. A full enumeration of these experiments is shown in Table 5.

Table 5
Import Substitution Simulation Results

Export Industry	Supplier Industry	Input Coefficient Change	Increase In GRP	Percentage Change in GRP
12. Print. & Pub.	11. Paper 12. Print & Pub. 36. Prof. Serv.	.000 to .062 .021 to .084 .064 to .108	\$1,937 m.	0.66%
18. Fab. Metals	18. Fab. Metals	.005 to .010	\$1,123 m.	0.38%
19. Ind. Mach.	18. Fab. Metals 19. Ind. Mach.	.005 to .101 .048 to .078	\$1,074 m.	0.36%
20. Computer & Elec.	20. Comp. & Elec. 34. Fin. & Ins. 36. Prof. Serv.	.100 to .165 .037 to .063 .031 to .066	\$2,188 m.	0.74%
21. Transp. Equip.	21. Transp. Equip.	.037 to .241	\$1,183 m.	0.40%
26. Air Transp.	36. Prof. Serv.	.029 to .098	\$241 m.	0.08%
32. Information	32. Information 34. Fin. & Ins. 36. Prof. Serv.	.104 to .217 .029 to .061 .049 to .105	\$3,066 m.	1.04%
36. Prof. Serv.	36. Prof. Serv.	.015 to .131	\$5,730 m.	1.94%

The changes in input coefficients listed in Table 5 can be regarded as “large” changes, and are used to illustrate the maximum potential for import substitution of this kind. The changes used generate increases in GRP that range from 0.08% (in the case of Air Transportation) to 1.94% (in the case of Professional and Management Services). Except for Air Transportation, the import substitution experiments generate at least \$1 billion in additional Gross Regional Product.

As noted above, Professional and Management Services appear as a supplier industry with import replacement potential for 4 out of the 8 export industries examined. Fabricated Metals and Finance and Insurance appear twice each. These three are key sectors in the local economy, and these results suggest that the possibility of promoting them as suppliers to local export industries might be a strategic economic development priority.

4. Indicators, Goals and Objectives, and Strategies

4.A. Indicators of Exports

The Regional Economics Applications Laboratory (REAL) of the University of Illinois at Urbana-Champaign updates its estimates of exports by sector annually, and REAL also tracks Gross Regional Product and employment by industry sector. REAL does not track imports into the metropolitan area.

4.B. Goals

A possible goal is to increase exports in those large export industries where the impact on GRP is greatest. The goals might be to increase exports in the following industries by \$1 billion beyond the amount that otherwise would occur:

- 14. Chemicals and allied products
- 19. Industrial machinery and equipment
- 20. Computer and other electric products
- 24. Wholesale trade
- 26. Air transportation
- 34. Finance and insurance

A goal for import replacement might be to concentrate on the local Professional and Management Services sector as a supplier to various local industries – Printing and Publishing, Computer and Electric Products, Air Transportation, Information, and Professional and Management Services itself. A survey might be conducted to determine the amounts of these services purchased by local firms in these industries, and then a numerical goal might be set for an increase in these purchases. Other targets of opportunity exist as shown in Table 5.

4.C. Strategies

The strategies that might be followed to promote exports in the six industries have similarities and differences. All six of the industries rely on highly skilled workers, so basic and advanced education and training infrastructure will be needed. CMAP is studying this issue, and this list of export industries can be used to guide formulation of strategy in this arena. All six industries also rely on innovation to be competitive. Innovation is the subject of another report that is being prepared by RCF. The nature of the innovation process varies, so different specific policies will be needed. Further, clearly the Wholesale Trade and Air Transportation industries rely on the transportation infrastructure, which is another topic of intense study by CMAP.

Beyond these basic factors, perhaps the State of Illinois could consider expansion of the DCEO International Trade Centers program to include promotion of the export of services and promotion of all exports to the rest of the U.S. Alternatively, the metropolitan area might consider the creation of a Chicago Export Bureau that could be modeled after the Chicago Convention and Tourism Bureau. This new agency would market the metropolitan area to the rest of the nation, with particular emphasis on a shorter list of target industries such as the six export industries listed above.

The expanded DCEO program and/or the Chicago Export Bureau could also be responsible for studying and promoting the use of Professional and Management Services by local firms. Staff work will be needed to determine viable methods for promoting import replacement. RCF views as a tentative recommendation to embark on import replacement efforts, but the simulation studies suggest a large possible payoff.

Export promotion is big business in the U.S. and around the world. Every state in the nation has a program of export promotion to foreign countries, and the U.S. has several major programs as well (Departments of Commerce and Agriculture). These programs often are criticized for not having clear strategies and explicit goals. However, detailed study of the DCEO program (and other programs) is beyond the scope of this report. Instead, RCF suggests that CMAP might initiate a discussion of ways and means of promoting exports from the metropolitan area to the rest of the nation as part of a more comprehensive economic development strategy. RCF outlines approaches to a more comprehensive economic development strategy in the report titled “What Makes Regions Grow,” and makes suggestions for making the Chicago region more innovative in the report “The Innovation Strategy.” An export promotion strategy might, for example, target certain sectors of the local economy that have the potential to expand their markets - based on recent performance and demand projections. This report has identified some sectors in the local economy that have this potential. The next steps are to set up a program to work with firms in these sectors to find out what assistance they would need to expand. It is known generally that one-on-one counseling is the most effective approach, although conferences and seminars are cost-effective methods for exposing large numbers of firms to the idea of finding new markets. A report commissioned by the U.S. Small Business Administration recommends that states charge fees for one-on-one services. In any event, the nature of the export promotion program should depend upon the objectives of the program.

Appendix A

This appendix presents two basic economic models that form the basis of this report; a basic Keynesian multiplier model (with imports) and a simple input-output model.

Keynesian Model

The Keynesian model is based on the definition of regional income and final output, written

$$(1) \quad Y = C + I + (X - M),$$

where Y is total local income, C is total consumption spending by the local population, I is total investment spending by local firms, X is exports, and M is imports. Total output equals the amount spent on consumption by local consumers, plus the amount spent on investment by local firms, plus the amount spent on exports from the local economy by buyers located elsewhere, and minus the amount spent on imports. Imports are subtracted because consumption is the *total* amount spent by local households, including imports. (It is assumed for simplicity that investment spending is all on locally produced goods and services.) The model includes two behavioral equations, the consumption function and the import function. These are written

$$(2) \quad C = a + bY$$

and (3) $M = c + dY.$

These equations embody the idea that both types of spending depend upon local income. These two equations are substituted into the income equation, and then the equation is solved for equilibrium income, as follows.

$$(4) \quad Y = (a + bY) + I + X - (c + dY)$$

$$Y - bY + dY = (a-c) + I + X$$

$$Y(1 - b + d) = (a-c) + I + X, \text{ so}$$

$$(5) \quad Y = [(a-c) + I + X]/(1 - b + d).$$

This equation has two basic implications that are important for this report.

1. Local income is a positive function of exports (X). An increase in exports of one unit will increase local income (Y) by

$$(6) \quad 1/(1 - b + d).$$

Suppose the $b = .75$ and $d = .25$. These assumptions mean that households spend \$0.75 of each additional dollar of income, and that \$0.25 of that spending is on imports from outside the metro area. In other words, \$0.50 is spent on locally-produced goods and services. Given these figures, the multiplier effect of an increase in exports equals $1/(0.5) = 2$.

2. Local income is lower the greater is spending on imports. Local income is smaller if c (the constant term in the import equation) or d (the coefficient on income in the import equation) is larger. For instance, in the previous numerical example, if d increases from 0.25 to 0.30, the multiplier effect of an increase in exports declines from 2 to $1/(0.55) = 1.82$.

In short, the total income of a local economy depends upon its ability to export and upon its ability to supply itself with goods and services.

Input-Output Model

The research contained in this report makes use of the input-output model for the economy of the Chicago metropolitan area developed by the Regional Economic Applications Laboratory at the University of Illinois at Urbana-Champaign. This section

is a brief introduction to input-output models. The model is called input-output because it explicitly includes all of the intermediate goods and services that are used in the production of final goods and services. The Keynesian model discussed above is a model of *value added* only, so it leaves out much of the detail of the economy.

The basic data for the input-output model is a transactions table, a simplified version of which is shown in Table 6. This table of transactions has been drawn up to resemble an urban economy (but one without a government), so the example is somewhat realistic. The local economy consists of four sectors; manufacturing, services, trade, and households. Across the top of the table the columns carry the labels of the sectors to which output is sold. Output is sold to the four local sectors, and there are exports to buyers outside the urban area. Down the left-hand side of the table are listed the sectors that supply inputs to the production activity that is carried on in the urban area.

Table 6
Input-Output Transactions Table

Inputs Supplied By	Output Sold to	Output Sold to	Output Sold to	Final Demand	Final Demand	Gross Output
	Manuf.	Services	Trade	Households	Exports	
Manufacturing	6	4	10	0	20	40
Services	5	8	2	25	10	50
Trade	0	0	0	30	0	30
Local Labor, Capital, Land	14	33	8	0	0	55
Imports	15	5	10	0	--	30
Total Inputs	40	50	30	55	30	

The manufacturing, services, and trade sectors are listed as suppliers of intermediate inputs. The other inputs used in local production include the services of labor, capital, and land. These inputs create the value added by the local economy. We assume that all of these primary inputs are owned by local households. This means that

the income earned by these basic factors of production will accrue entirely to the local economy. The last input used in local production is imports from outside the urban area, and are shown as the fifth line in Table 6. Manufacturers produce a wide variety of goods; a good deal of local manufacturing is exported, and some is purchased by other local manufacturing, service, and trade firms. It is assumed that manufacturers do not sell directly to local households; instead manufactured products are sold to households by firms in the trade sector. The service sector in an urban area is a very large and diverse collection of activities as discussed in the body of this report. Services are both purchased locally and exported.

Local households supply the labor, capital, and land used by the three production sectors. The production of services requires a great deal of labor, and some and capital as well. Manufacturing uses labor and factories, which require land and capital. The trade sector purchases goods from local suppliers and from firms located outside the urban area, and requires a relatively small amount of local labor, capital, and land compared to total sales volume. Goods and services that are imported are presumed to be imported by firms, and households then purchase those imports from local service and trade firms. The other imports are used as intermediate inputs into local production.

The numbers in each column represent the dollar amounts of the inputs used in the sector shown at the top of the column. For example, manufacturing in the urban area used \$6 worth of manufactured goods made locally, \$5 in local services, \$14 in local labor, capital, and land, and \$15 in imports. The total value of inputs in local manufacturing is therefore \$40. Consider the column labeled households. This column does not represent “inputs” into a production process, but rather it lists final consumption

activity. Households bought nothing from local manufacturers (as mentioned above), and purchased \$25 in services and spend \$30 with the local trade sector. In this model there is no saving; households spend all of their incomes, although the model could be expanded to include saving and investment. The column for exports shows the amounts sold to customers outside the urban area by the manufacturing and service sectors. The final column is called gross output, which is the total dollar value of sales for a sector. For example, the local manufacturing sector had sales of \$40. This is not the value added (which was \$14), but the value of sales. The entry of \$40 is the sum of the figures in the first row, the row that shows the value of sales by local manufacturers to the various sectors (including itself). The \$40 is also equal to the total value of inputs purchased by the local manufacturing sector. Total purchases of inputs equal total sales because profits are included in the payments to local households.

The last column also list a “gross output” for households. This figure of \$55 is really the total income earned by households from the sale of the services of labor, capital, and land. Total income earned by households is also equal to the total value added in the local economy, which is the Gross Regional Product. Finally, total exports were \$30, which equals the total imports shown on the fifth row. The fourth and fifth columns together constitute the final demands for goods and services.

The body of this report refers to input coefficients. These refer to the intermediate inputs as proportions of gross output. For example, the manufacturing sector purchased \$6 of inputs from itself, so that input coefficient is $6/40 = 0.15$. The other input coefficients for manufacturing are 0.125 for services, 0.0 for trade, and 0.375 for imports. Value added is 0.35 of the total gross output in manufacturing. The import

substitution experiments in this report involve increasing one or more of these coefficients – and reducing the input coefficient of imports by an equal amount.

Appendix B: Export Industries and Firms

This appendix provides details about the leading export industries for metropolitan Chicago as listed in Table 4 above. The following table lists the component industries in each of the leading export industries, and provides some examples of firms in those industries. The Crain's Chicago Business web site has extensive up-to-date lists of firms in the Chicago metropolitan area with some basic information on each company. Many of these examples are drawn from this source.

Export Industry	Component Industries	Firms
Food & Kindred Products	Flour milling Soybean processing Breakfast cereal mfg. Confectionery mfg. Frozed food mfg. Fluid milk mfg. Cheese mfg. Animal slaughtering Poultry processing Bread & bakery products Cookie, cracker & pasta Tortilla mfg. Snack food mfg. Coffee & tea mfg. Flavoring Seasoning	Kraft Foods Sara Lee Corn Products Internat. Fortune Brands Treehouse Foods John B. Sanfilippo & Son Tootsie Roll Lifeway Foods
Printing and Publishing	Printing Support activities for printing Newspaper publisher Periodical publisher Book publisher Director publisher Internet publishing and broadcasting	Tribune Co. Sun Times RR Donnelley United Stationers

Export Industry	Component Industries	Firms
Chemicals & Allied Products	Basic chemical mfg. Petrochemicals Alkalies Carbon black Other inorganic chemicals Other organic chemicals Plastics Synthetic rubber Synthetic fibers Fertilizer Pesticide & other ag. chem Pharmaceutical and medicine mfg. Paint, coating, adhesives Soap, cleaning Printing ink	Baxter International Abbott Laboratories WW Grainger Nalco CF Industries Hospira Stepan Co. Ventas Akorn Acura Pharmaceuticals Nanophase Technology
Fabricated Metals	Forging and stamping Cutlery & hand tools Architectural & structural metals Boiler, tank & shipping containers Ammunition Arms, ordinance Hardware Spring and wire Machine shops Screw, nut & bolt Coating, engraving Valve & fittings Plumbing fixtures Ball bearings Fabricated pipe	A. M. Castle Coleman Cable Chicago Rivet & Machine Ace Hardware Ryerson, Inc.

Export Industry	Component Industries	Firms
Industrial Machinery and Equipment	Machinery; farm, lawn & garden, construction, mining Industrial machinery Vending machinery Optical instruments, lens Photographic & photocopying machinery HVAC equipment Metalworking machinery Engine, turbine & power transmission equipment Pumping equipment Air & gas compressors Material handing equip. Packaging machinery Industrial furnace & ovens	Illinois Tool Works Idex John Bean Technologies Zebra Technologies Middleby Corp. MFRI Rubicon Technology
Computer & Other Electric Products	Computer & peripherals Audio, video & communication equip. Semiconductors Printed circuits Electronic instruments Magnetic and optical recording media mfg.	Motorola Anixter Molex Federal Signal Richardson Electronics Methode Electronics Wells-Gardner Panduit Littelfuse Cabot Microelectronics Westell Cobra Telular
Transportation Equipment	Motor vehicle Motor vehicle parts Aerospace products Motorcycle Ship building & repair Military armored vehicle	Navistar Boeing Tenneco Anixter LKQ Crop. Sauer Danfross Northstar Electro-Motive Diesel

Export Industry	Component Industries	Firms
Wholesale Trade	Wholesale trade	Lawson Products ACCO Brands United Stationers AAR Follett Corp.
Air Transportation	Air transportation	United Airlines (UAL) American Airlines, etc.
Information	Radio & TV broadcasting Cable networks and program distribution Telecommunications	Tribune Co. Telephone and Data Systems (TDS) iPCS
Finance and Insurance	Securities, commodity contracts, investments Insurance carriers Funds, trusts & other financial vehicles Management of companies	Allstate CNA Aon CME Group Northern Trust Unitrin Morningstar Discover Financial Serv. Old Republic GATX Arthur J. Gallagher MB Finance Wintrust Financial
Real Estate	Real estate rental and leasing	Equity Residential General Growth Properties CB Richard Ellis Grubb & Ellis Jones, Lang, LaSalle Inland Real Estate Group First Industrial Realty Trust Ventas

Export Industry	Component Industries	Firms
Professional and Management Services	Internet service providers Data processing Legal services Accounting services Architectural, engineering services Specialized design services Management, scientific, and technical consulting services Scientific research and development services Advertising	Law firms (Crain's has extensive list) Accounting firms (Crain's has extensive list) McKinsey Consulting, Chicago office Nalco Hewitt Associates Tellabs Navigant Consulting Huron Consulting Group Heidrick & Struggles ATC Technology Corp SPSS Grant Thornton A. T. Kearney Edelman Public Relations