

Exports in the Great Lakes: How Great Lakes Metros Can Build on Exports and Boost Competitiveness

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“Raising exports holds out the promise of creating thousands of new jobs in Great Lakes metros that desperately need them. If the Great Lakes metros can create and then relentlessly recreate the products and services the world demands, more of their people can enjoy the benefits of a globalized economy, rather than suffering from its rigors.”

Findings

Using newly developed information from the Brookings report “Export Nation,” this analysis of export activity in the 21 largest metros of the Great Lakes region for the years 2003 to 2008 reveals that:

- **Exports support 1.95 million jobs in the largest metropolitan areas in the Great Lakes.** Even after decades of decline in manufacturing employment, export industries (primarily manufacturing) still employ millions of people in the region, ranging from 398,000 in Chicago, to 240,000 in Detroit, to 20,000 in Des Moines, as of 2008.
- **Great Lakes metros have some of the highest dollar volumes of exports and the greatest reliance on exports of any of the large metropolitan areas in the nation.** Chicago and Detroit rank third and ninth, respectively, in total dollar export volume among top 100 metropolitan areas, and Minneapolis, St. Louis, and Indianapolis all rank in the top 20. Great Lakes metros also tend to export a greater proportion of their economic output than most large metropolitan areas.
- **In general, Great Lakes metros with the highest levels of manufacturing employment are less innovative than their manufacturing oriented or export intensive peers.** Nationally, metros that are manufacturing oriented or export intensive (or both) tend to create patents at much higher rates than other metros. But most Great Lakes metros underperform on innovation compared to their national peers, despite high levels of manufacturing employment and generally high export intensity. Only three of the 15 most manufacturing-intensive metros in the region, Detroit, Minneapolis, and Rochester, post above average patenting rates.
- **The region’s metros lag the nation’s other large metros in terms of service exports and service export growth.** Only Chicago and Minneapolis export more services as a share of total output than do the nation’s top 100 metros as a whole, and only four Great Lakes metros (Syracuse, Buffalo, Des Moines, and Columbus) outpaced other large metros in the growth of their service exports. Despite this lackluster growth performance relative to other metros, inflation-adjusted service exports grew faster than output in 20 of the 21 Great Lakes metros from 2003 to 2008 (Pittsburgh was the only exception).
- **Considerable growth in global customers for products and services produced in the Great Lakes metros will come from the large emerging markets of Brazil, India, and China.** Most Great Lakes metropolitan areas (12 out of 21) send 8.6 percent or more of their export value to Brazil, India, and China (the BIC countries), meaning that they meet or exceed the average large metro export share going to the BIC nations. Some Great Lakes metros, such as Youngstown, Des Moines, and Columbus, have seen huge jumps in the value of their exports to BIC countries over the last five years.

A legacy of success in exports does not guarantee future dominance, a lesson that Great Lakes metros should have learned through rough experience. But raising exports holds out the promise of creating thousands of new jobs in Great Lakes metros that desperately need them. For that reason, metropolitan leaders and their federal, state, and private sector partners must be aggressive and creative in determining what new or re-imagined goods and services the world demands from them, and equally dedicated to expanding their global reach.

Introduction

In the beginning of 2010, with the U.S. economy struggling to produce output or jobs, President Obama devoted a portion of his State of the Union Address to “fixing the problems that are hampering our growth.” One of these problems, according to the President, was a lack of exports. The President linked an increase in exports to an increase in jobs, and pledged to double exports over the next five years.²

Doubling exports, whether or not it happens in the next five years, would be a huge boon to most of the Great Lakes region’s largest metropolitan areas, bringing them thousands of good jobs and building on their existing strengths in the world economy. This report focuses attention on the benefits of exporting, and highlights the existing and emerging strengths, and some weaknesses, of Great Lakes metros in global trade.

It may seem counterintuitive to posit trade as one of the ways that these metros can emerge from the recession and the doldrums of economic decline that have plagued most of them. The region is accustomed to seeing itself on the losing end of globalization, as manufacturing has moved abroad, imported goods have increased their market share, and trade barriers and currency manipulations impede the entry of U.S.-made goods into foreign markets.

But exports bring tremendous benefits to companies, regions and the nation as a whole. Metros in the Great Lakes region already have depth in exports, giving them crucial international connections. They have a foothold in the emerging markets of Brazil, India, and China, making and exporting products that are in high demand in these fast-growing nations. A few of the Great Lakes metros have very high rates of innovation, which is both a knock-off result of international competition and an important source of competitiveness for those companies as they seek to produce new and better goods and services for a world-wide market. The Great Lakes metros could be well-positioned to benefit from the current national focus on doubling exports and from targeted metropolitan efforts to expand their foreign markets for goods and services.

To take advantage of their global connections and a new federal focus on exports, however, the region’s metropolitan areas, particularly those that have focused on auto manufacturing, will have to rethink what products they produce for the global market. They will have to be more innovative, both in determining what new products and services to export and in retooling their existing exports to capture a larger share of global demand. While bolstering exports will not replace the tens of thousands of manufacturing jobs that have disappeared in the last few decades, the export of goods and services is likely to be an important source of job growth for the region in the future.

Why Export?

For more than 200 years, economists have linked trade with economic growth.³ Trade drives growth for several reasons. First, exporting forces companies to stay on the cutting edge of competition and exposes them to international best practices. Even if companies initially struggle in foreign markets, there is evidence that this intense competition forces them to improve over time. For example, Taiwanese exporting firms are more likely to invest in R&D and to witness faster productivity growth.⁴

Second, trade allows companies to spread the costs of developing a particular product over a much larger number of consumers. Many products with large upfront costs (like Hollywood movies, pharmaceuticals, solar technologies, and computer processing microchips) simply could never be profitable if not for vast international markets, which allow producers to cut down on the costs of producing a single product.⁵ In the Great Lakes metros, concentrations of workers in research and development, design, marketing, and management also support, and are supported by, global product sales.

Just as important as the firm-level benefits are the benefits to individual workers from

export industries. Export-related jobs offer good pay to workers at all levels of education, including those without college degrees. Manufacturing jobs pay better than average, and even within the same industry, firms that produce more for export markets pay more even after adjusting for the effects of firm size and capital intensity.⁶ Other research finds that in the 1990s wages were roughly 11 percent higher for exporting companies, adjusting for industry and state location. This was true for both production and non-production workers, which implies that workers with low education attainment also benefit from higher wages if their company exports.⁷ Since export industries have more low-skilled workers than high-skilled workers, increasing exports would tend to decrease wage inequality between skill groups.

Now is a particularly critical time for Great Lakes areas to be smart about their export strategies. There is new national attention to increasing the volume of U.S. exports. In his 2010 State of the Union Address, President Obama called for a doubling of U.S. exports in the next five years. Administration officials have also cited greater exports as a way to bolster the condition of the hard-hit manufacturing communities in the U.S.⁸

As Lawrence Summers, the head of the National Economic Council, noted in a speech on the prospects of manufacturing communities in the next economy, “Ninety-five percent of the world’s customers are outside our borders.” Great Lakes metros must sell to these customers to make up for slackened demand in the U.S. and of course to take advantage of fast-growing markets. With rapid urbanization and growth in emerging economies, developing countries will drive the growth of the world’s consumption in the future. The United Nations forecasts that 70 percent of the world’s population will be urbanized by 2050.⁹ This urbanized population will increasingly have more purchasing power and demand more specialized goods and services.

Indeed, despite the difficulties wrought by the recession, as the global economy begins to recover there are promising signs that export growth is returning to its pre-recession trajectory. While national GDP grew at 2.9 percent from the first quarter of 2009 to the first quarter of 2010, the BEA reports that exports grew at 15.7 percent, with goods exports expanding by a remarkable 20.7 percent.

There are, therefore, many reasons for the Great Lakes metros to pursue an export growth strategy to increase jobs, incomes, and prosperity. Many Great Lakes metros are well-positioned to do so for the reasons described in the findings below.

Findings¹⁰

Using newly developed information from the Brookings report “Export Nation,” this analysis of export activity in the 21 largest metros of the Great Lakes region for the years 2003 to 2008 reveals that:

- **Exports support 1.95 million jobs in the largest metropolitan areas in the Great Lakes.** Even after crushing levels of job losses in manufacturing and related industries, export industries (which are dominated by manufacturing), still are responsible for 1.95 million jobs in the Great Lakes’ largest metropolitan areas, as table 1 shows.

Eighteen out of the 21 Great Lakes largest metros have a higher share of their jobs coming from exports than do the nation’s largest metros as a whole. As of 2008, one out of every eight jobs in Youngstown and Detroit was tied to exports; in Grand Rapids, the share was almost one out of every seven.

Export-related employment consists not only in jobs in companies that sell abroad, but also in firms that are part of the supply chain of the exporting companies. For example, the export-related jobs in transportation equipment are jobs in companies that produce cars, aircraft, and related components for sale abroad and jobs in the domestic firms that sell parts to these companies.

Table 1. Nearly one in 10 jobs in the Great Lakes' large metros relies on exports

Rank	Metro	Export jobs as share of employment	Export jobs (2008)	Industry with the most export-related jobs	Industry's share of export-related jobs
4	Grand Rapids-Wyoming, MI	13.8%	53,925	Transportation Equipment Manufacturing	26.7%
6	Youngstown-Warren-Boardman, OH-PA	12.5%	30,097	Primary Metal Manufacturing	28.1%
7	Detroit-Warren-Livonia, MI	12.5%	239,910	Transportation Equipment Manufacturing	47.1%
10	Milwaukee-Waukesha-West Allis, WI	11.6%	100,440	Machinery Manufacturing	24.6%
11	Rochester, NY	11.5%	60,332	Machinery Manufacturing	25.2%
14	Dayton, OH	10.8%	44,133	Transportation Equipment Manufacturing	24.0%
17	Toledo, OH	10.6%	34,597	Transportation Equipment Manufacturing	33.0%
20	Cleveland-Elyria-Mentor, OH	10.3%	110,747	Machinery Manufacturing	17.3%
22	Minneapolis-St. Paul-Bloomington, MN-WI	9.9%	179,973	Computer and Electronic Product Manufacturing	28.2%
24	Cincinnati-Middletown, OH-KY-IN	9.7%	103,546	Transportation Equipment Manufacturing	21.7%
29	Akron, OH	9.5%	32,654	Machinery Manufacturing	17.9%
30	Louisville-Jefferson County, KY-IN	9.5%	60,447	Transportation Equipment Manufacturing	21.8%
33	Syracuse, NY	9.3%	30,470	Computer and Electronic Product Manufacturing	24.0%
36	Indianapolis-Carmel, IN	9.2%	85,158	Transportation Equipment Manufacturing	21.3%
41	St. Louis, MO-IL	8.8%	121,865	Transportation Equipment Manufacturing	21.5%
43	Chicago-Naperville-Joliet, IL-IN-WI	8.7%	397,924	Machinery Manufacturing	13.0%
45	Buffalo-Niagara Falls, NY	8.6%	47,962	Transportation Equipment Manufacturing	14.6%
49	Madison, WI	8.4%	30,362	Agriculture	14.1%
56	Columbus, OH	8.0%	76,282	Transportation Equipment Manufacturing	23.7%
57	Pittsburgh, PA	7.8%	90,547	Primary Metal Manufacturing	13.7%
79	Des Moines-West Des Moines, IA	6.1%	20,533	Machinery Manufacturing	18.1%
	Great Lakes metros	9.7%	1,951,903		
	Top 100 metros	8.1%	7,688,744		
	United States	8.3%	11,854,350		

As noted above, these export-related jobs tend to pay well. New Brookings research has found that for every \$1 billion dollar increase in the exports of the industry in which they work, workers in the exporting industries located in the top 100 metro areas earn roughly one to two percent higher wages. Even workers without high school diplomas who work in export industries earn this premium. This result does not depend on worker characteristics, occupation, or the characteristics of the metropolitan area. The explanation for the premium seems to be that working in a metro exporting industry makes workers more productive. Other studies have suggested that exporting firms are more innovative, which may explain why they can afford to pay higher wages.¹¹

In addition to higher wages, exports also translate into more job opportunities. There is a very strong correlation between export increases and job increases, even adjusting for GMP (gross metropolitan product). This is a critical fact in our so-far jobless recovery. Even in Great Lakes metros where GMP has risen (as in Columbus, Indianapolis, Madison, and St. Louis), there has not been an increase in the number of jobs.¹² The relationship between export growth and job growth is much tighter than the relationship

between GMP growth and job growth. Changes in exports may not be the primary cause of job gains—the obverse might be at least partly true if more jobs lead to more exports. But from the perspective of metropolitan areas, it really doesn't matter. Jobs and exports clearly go together. The bottom line is that 5,800 jobs supported every \$1 billion in 2008 exports for the average metropolitan area.

• **Great Lakes metros have some of the highest volumes of exports, and the greatest reliance on exports, of any of the large metropolitan areas in the nation.**

Chicago and Detroit rank third and ninth, respectively, in total export volume among top 100 metropolitan areas, and Minneapolis, St. Louis, and Indianapolis all rank in the top 20. Great Lakes metros also tend to get more of their GMP from exports than most large metropolitan areas. Youngstown, Toledo, Indianapolis, Grand Rapids, Detroit, Dayton, and Milwaukee are all among the twenty most export-intensive metropolitan economies in the nation. (See table 2). Moreover, exports helped prop up economic growth throughout the

Table 2. The large Great Lakes metros tend to be more export intensive than the nation

Rank export intensity	Metro	Exports as a percentage of GMP (export intensity)	Total exports (bln)	Industry contributing the most to exports	Industry's share of exports
6	Youngstown-Warren-Boardman, OH-PA	18.0%	\$3.64	Primary Metal Manufacturing	37.4%
8	Toledo, OH	15.8%	\$4.28	Transportation Equipment Manufacturing	33.8%
9	Indianapolis-Carmel, IN	15.2%	\$12.79	Chemical Manufacturing	37.3%
10	Grand Rapids-Wyoming, MI	15.1%	\$5.27	Transportation Equipment Manufacturing	31.8%
12	Detroit-Warren-Livonia, MI	14.7%	\$26.91	Transportation Equipment Manufacturing	47.6%
16	Dayton, OH	13.8%	\$4.71	Transportation Equipment Manufacturing	28.5%
17	Milwaukee-Waukesha-West Allis, WI	13.8%	\$10.25	Machinery Manufacturing	21.9%
21	Cleveland-Elyria-Mentor, OH	13.1%	\$12.70	Transportation Equipment Manufacturing	14.9%
24	Cincinnati-Middletown, OH-KY-IN	12.9%	\$11.82	Transportation Equipment Manufacturing	23.5%
27	Louisville-Jefferson County, KY-IN	12.6%	\$6.65	Transportation Equipment Manufacturing	21.1%
28	Akron, OH	12.5%	\$3.64	Transportation Equipment Manufacturing	17.2%
34	Rochester, NY	12.1%	\$6.72	Machinery Manufacturing	23.8%
35	St. Louis, MO-IL	12.1%	\$14.64	Transportation Equipment Manufacturing	18.9%
38	Buffalo-Niagara Falls, NY	11.6%	\$7.18	Chemical Manufacturing	24.6%
45	Chicago-Naperville-Joliet, IL-IN-WI	10.9%	\$52.88	Machinery Manufacturing	13.3%
47	Minneapolis-St. Paul-Bloomington, MN-WI	10.7%	\$18.99	Machinery Manufacturing	13.3%
53	Columbus, OH	10.3%	\$8.72	Transportation Equipment Manufacturing	26.2%
57	Syracuse, NY	10.0%	\$3.59	Machinery Manufacturing	10.5%
62	Madison, WI	9.7%	\$3.00	Chemical Manufacturing	14.1%
68	Pittsburgh, PA	9.2%	\$10.13	Machinery Manufacturing	12.7%
76	Des Moines-West Des Moines, IA	8.5%	\$2.58	Machinery Manufacturing	24.1%
	Great Lakes metros	12.0%	\$231.08		
	Top 100 metros	10.3%	\$1,036.88		
	United States	11.4%	\$1,609.41		

region. For all of the large Great Lakes metros except Pittsburgh, real exports grew faster than real GMP from 2003 to 2008, meaning that many companies benefitted from growing international demand. For the average Great Lakes metro, GMP growth was just 1.1 percent each year, but export growth was 6.1 percent.

The most export-intensive Great Lakes metros currently have some of the nation's highest unemployment rates and largest declines in GMP from their pre-recession peaks (Indianapolis is an intriguing exception). Clearly, having a strong export orientation in 2008 did not, by itself, insulate a metro economy from serious shocks in the Great Recession.¹³

The region's most important export industry, transportation equipment manufacturing, saw exports drop 7.9 percent from 2007 to 2009. This hurt Detroit in particular, though the declines were coming even before the recession. The value of transportation equipment exports from Detroit free-fell by more than \$2 billion from 2003 to 2008. This drop led to zero net growth in exports over the five-year period studied, as large gains in petroleum and coal manufacturing, business services like architecture and royalties, and tourism were not enough to offset these massive losses. Significant exports of transportation equipment to Brazil kept the numbers from being worse. Dayton and Buffalo were also hit hard by declines in transportation exports.

In other cases, metro areas' major exports come from mature industries that are responding to international competition just as economic theory and research suggests that they will: they are restructuring, become vastly more productive and efficient, and, in turn, less job-intensive. Youngstown's main export category of primary metal manufacturing (in this case steel making) was the biggest contributor to the area's overall export growth from 2003 to 2008. But as productivity in the steel industry has skyrocketed, labor needs have plummeted. As the Bureau of Labor Statistics notes, "Over the past 25-30 years, steel producers have, in some cases, reduced the number of work-hours required to produce a ton of steel by 90 percent." BLS predicts employment in the steel industry will continue to drop, shrinking by 12 percent between 2008 and 2018.¹⁴

It is the nature of global competition to force more innovation, and more productivity, which means, over the long run, fewer traditional production jobs in a particular industry, even when the industry itself remains relatively strong. But innovation also can open up opportunities for new kinds of jobs in new, advanced product lines and related services. The challenge for most Great Lakes metros with economies dependent on manufacturing is to use their old strengths as a springboard to new products, processes, and services; and then to relentlessly pursue the inevitable next generation of products, processes, and services.

▪ **In general, Great Lakes metros with the highest levels of manufacturing employment are less innovative than their manufacturing oriented or export intensive peers.** Nationally, metros that are manufacturing oriented or export intensive (or both) tend to create patents at much higher rates than other metros. The average large metropolitan area had a patent rate of 3.6 granted patents per thousand workers from 2001 to 2008, while the 37 large U.S. metros with more than 10 percent of their workforce employed in manufacturing had a patent rate of 5.15 granted patents per thousand workers.¹⁵

But most Great Lakes metros underperform on innovation, given their high degree of manufacturing employment. Out of 15 manufacturing-intensive metros in the region (those with more than 10 percent of their workers employed in manufacturing), only Detroit, Minneapolis, and Rochester exceeded the 5.15 patents-per-thousand-workers average of manufacturing-intensive metros. And only six of the Great Lakes metros had patent rates above the average for large metropolitan areas, regardless of their degree of manufacturing intensity, as table 3 shows.

In most metros, the positive relationship between innovation and exporting cannot be attributed solely to manufacturing; even among metros with the same share of workers employed in manufacturing, metropolitan areas that are more export-oriented have higher patent rates than less export-oriented metropolitan areas. This is consistent with academic research showing that firms are more likely to become exporters after

Table 3. Many Great Lakes metros are less innovative than their manufacturing and export intensities would imply

Rank patents per 1,000 workers	Metro	Patents per 1,000 workers	Share of workforce in manufacturing	Export intensity
5	Rochester, NY	11.83	13.3%	12.1%
12	Minneapolis-St. Paul-Bloomington, MN-WI	6.89	10.8%	10.7%
16	Detroit-Warren-Livonia, MI	5.88	12.3%	14.7%
23	Akron, OH	4.57	12.9%	12.5%
26	Madison, WI	4.02	8.8%	9.7%
27	Cincinnati-Middletown, OH-KY-IN	3.88	11.2%	12.9%
33	Milwaukee-Waukesha-West Allis, WI	3.05	15.2%	13.8%
36	Chicago-Joliet-Naperville, IL-IN-WI	2.85	10.3%	10.9%
38	Cleveland-Elyria-Mentor, OH	2.82	12.9%	13.1%
41	Pittsburgh, PA	2.66	8.5%	9.2%
43	Indianapolis-Carmel, IN	2.52	10.2%	15.2%
44	Syracuse, NY	2.45	9.6%	10.0%
45	Buffalo-Niagara Falls, NY	2.43	10.4%	11.6%
47	Des Moines-West Des Moines, IA	2.32	5.9%	8.5%
50	St. Louis, MO-IL	2.28	9.3%	12.1%
54	Grand Rapids-Wyoming, MI	2.01	17.4%	15.1%
56	Dayton, OH	1.88	11.8%	13.8%
57	Columbus, OH	1.84	7.8%	10.3%
60	Toledo, OH	1.74	13.6%	15.8%
75	Youngstown-Warren-Boardman, OH-PA	1.09	14.5%	18.0%
79	Louisville-Jefferson County, KY-IN	0.99	11.5%	12.6%
	Great Lakes metros average	3.33	12.6%	12.5%
	Top 100 metros average	3.59	8.9%	10.9%

they innovate, as the intensity of global competition prevents non-innovating firms from breaking out of local markets.¹⁶

In the Great Lakes, however, export intensity and manufacturing intensity are not necessarily leading to, or driven by, more innovation. This suggests that the region needs to ramp up its innovations within the manufacturing sector to fully realize the promise of a global-oriented export economy. “Innovate or die” is not just a mantra for Silicon Valley and other high-tech economies – it applies with equal or greater force to manufacturing.

The Great Lakes’ struggling metros will have to innovate in their existing product lines, following in the footsteps of places that have moved from rubber to polymers, or auto glass to solar technology. They will have to repurpose their manufacturing know-how to build new kinds of products, such as wind turbines or clean energy products. And they will have to exploit their existing assets in new ways, such as recognizing education as a major export industry. (“Selling” an education at Ohio State or Marquette University or Wayne

New Products, New Markets for Two Great Lakes Manufacturers

Cascade Engineering, based in Grand Rapids, Michigan, traditionally made plastic injected molded parts for the auto and furniture industries, like many firms in west Michigan. Recently, the firm has grown by moving aggressively into precision wind-turbines, recyclable plastics, and by turning increasingly towards global markets. It recently embarked on the development, production, and sale in the developing world of a lightweight water filtering product. The Biosand water filter is a plastic-injection molded, non-electric device, less than 10 pounds that can provide up to 75 gallons of safe drinking water a day.

Quality Electrodynamics, a medical device manufacturer that employs 60 workers in Cleveland recently made the Forbes magazine list of 20 most promising companies in the U.S. The company works closely with Case Western and University Hospitals. It released five new products last year and plans to release two more products – improved versions of coils used in medical equipment – that are sold principally in emerging markets around the world. QED is just one of nearly 50 medical imaging companies with about 3,000 employees in the Greater Cleveland area according to BioEnterprise, an organization that supports healthcare and bioscience companies. The medical imaging markets in China possess high potential for double digit growth rate over the next four years, analysts report, which means growing opportunity for Northeast Ohio's medical imaging firms.

Sources: "Cascade Engineering and Windquest Group launch HydrAid Biosand water filter for developing world," *Working With Water* (<http://www.workingwithwater.net/view/6531/cascade-engineering-and-windquest-group-launch-hydrAid-biosand-water-filter-for-developing-world>) and *Cascade Engineering: Markets & Products* (<http://www.cascadeng.com/markets/water/>)

Conversation with Baiju Shah, BioEnterprise

China Medical Imaging Markets, Market Research (<http://www.marketresearch.com/product/display.asp?productid=1130347>)

State to a foreign student counts as a service export.)

- **The region's metros lag behind the nation's other large metros in terms of service exports and service export growth.** Only Chicago and Minneapolis export more services as a share of total output than do the nation's top 100 metros as a whole. (See table 4.) Only four Great Lakes metros (Syracuse, Buffalo, Des Moines, and Columbus) outpaced other large metros in the growth of their service exports. Despite this lackluster growth performance relative to other metros, inflation adjusted service exports grew faster than GMP in 20 of the 21 Great Lakes metros from 2003 to 2008 (Pittsburgh was the only exception).

Long-term trends suggest that services are a better bet for export growth for advanced

Table 4. Services Exports, Great Lakes Metropolitan Areas

Rank	services export intensity	Metro	Services export intensity	Services export growth (2003-2008)
15		Chicago-Naperville-Joliet, IL-IN-WI	4.2%	36.1%
22		Minneapolis-St. Paul-Bloomington, MN-WI	3.9%	32.5%
28		Detroit-Warren-Livonia, MI	3.7%	27.1%
30		Buffalo-Niagara Falls, NY	3.7%	55.8%
32		Columbus, OH	3.7%	55.0%
34		St. Louis, MO-IL	3.6%	28.0%
35		Indianapolis-Carmel, IN	3.6%	31.6%
41		Rochester, NY	3.5%	39.6%
50		Syracuse, NY	3.4%	45.7%
57		Des Moines-West Des Moines, IA	3.3%	55.8%
59		Louisville-Jefferson County, KY-IN	3.2%	37.0%
60		Pittsburgh, PA	3.2%	14.3%
65		Cincinnati-Middletown, OH-KY-IN	3.1%	28.0%
68		Dayton, OH	3.1%	41.3%
69		Cleveland-Elyria-Mentor, OH	3.1%	36.3%
77		Milwaukee-Waukesha-West Allis, WI	2.9%	34.8%
80		Madison, WI	2.9%	41.2%
81		Akron, OH	2.9%	38.0%
86		Toledo, OH	2.8%	29.4%
88		Grand Rapids-Wyoming, MI	2.7%	28.0%
90		Youngstown-Warren-Boardman, OH-PA	2.7%	39.6%
		Great Lakes metros	3.6%	34.2%
		Top 100 metros	3.8%	43.5%
		United States	3.7%	49.2%

economies than traditional manufacturing. The United States has been losing ground in terms of its share of global goods exports, as one would expect given the rapid economic growth of many developing countries. Over the last five years, products made in China, India, Brazil, and the Middle Eastern countries have made up an increasing share of world goods exports. The United States, though, is the global leader in service exports, selling \$525.8 billion worth to foreign residents in 2008.¹⁷ This represented 13.8 percent of global commercial service exports, making the United States by far the world's dominant service exporter.¹⁸

In the U.S. as a whole, service exports held up relatively well from 2007 to 2009, expanding annually by 0.9 percent compared to 0.6 percent GDP growth. Strong performance in exports of business, professional, and technical services offset poor performance in travel related service exports. This means that metros that are more service export oriented were partly sheltered from the worst of the recession, especially if their service exports are not tourism related. Rochester and Buffalo score particularly high on non-tourism service exports as a share of their economies, while Youngstown and Toledo are low service exporters with or without tourism.

The most promising way to boost service exports is to boost education attainment. Some of the fastest growing exports are in service industries that require a highly educated workforce, including various business, professional, and technical services (such as engineering and architectural services, installation, repair, legal, and medical services), financial services, and telecommunications, all of which grew faster than 15 percent per year from 2003 to 2008 in real dollars. Exports in royalties from intellectual property (such as patents and trademarks) expanded at over 13 percent each year.¹⁹

Accordingly, seven out of the ten Great Lakes metros with the highest shares of services exports also are among the ten Great Lakes metros with the highest percentage of the population age 25 and older with a bachelor's degree.²⁰ Similarly, of the ten metros that are weakest in service exports, six have the region's lowest bachelor's degree attainment levels. This correlation is imperfect: Madison has the highest percentage of college graduates of any of the region's metros, and it is near the bottom in terms of service exports, while Detroit and Buffalo have a far lower percentage of resident college graduates, but are quite strong in their share of service exports.

Given the growing importance of service exports to the U.S. economy as a whole, U.S. dominance in service exports, and the fact that the number of service jobs was growing (at least prior to the recession) in most Great Lakes metros even as these communities shed manufacturing jobs, Great Lakes metros should aggressively seek to expand their services export sector.²¹

▪ **Considerable growth in global customers for products and services produced in the Great Lakes metros will come from the large emerging markets of Brazil, India, and China.** Most Great Lakes metropolitan areas (12 out of 21) send 8.6 percent or more of their export value to Brazil, India and China (the BIC countries), meeting or exceeding the average large metro rate. Some Great Lakes metros, such as Youngstown, Des Moines, and Columbus, have seen huge jumps in the value of their exports to BIC countries over the last five years. Others, such as Detroit, Grand Rapids, Rochester, Pittsburgh, and Dayton, have seen only modest gains compared to the largest 100 metros.

With rapid urbanization, which increases consumer demand by increasing the specialization of occupations, developing countries will drive the growth of the world's consumption in the future, and Brazil, India, and China (the BIC countries) will play a major role in this trend. The International Monetary Fund estimates that the BIC countries combined will be more than a quarter of the world economy by 2015.²²

U.S. exports of chemicals almost doubled, computer and electronics more than doubled, and transportation equipment sales to the BICs almost tripled from 2003 to 2008. These are among the categories of goods that Great Lakes metropolitan areas produce and send to the BIC nations, so they are well- positioned to take advantage of additional growth in

Key Service Exports

In the latest rankings compiled by Shanghai Jiao Tong University, 16 of the top 100 universities in the world are in the Great Lakes Region, more than any other comparable geography. These universities, their affiliated medical centers, and world-class independent medical complexes (such as the Cleveland Clinic) are export leaders, educating and providing a growing share of high-value health and medical services to customers from around the world. In 2008-2009 the colleges and universities in the 21 largest Great Lakes metros educated over 84,000 foreign students, who spent approximately \$2.3 billion in tuition and living expenses. The Cleveland Clinic, and University of Michigan Hospitals attract thousands of foreign residents for specialized treatment every year. Just as importantly, these institutions' research, partnerships and direct services abroad build invaluable cultural knowledge, and commercial and personal relationships that facilitate global commerce.

Sources: Academic Ranking of World Universities (ARWU), 2009 (<http://www.arwu.org/ARWU2009.jsp>)

Brookings Institution analysis of 2008 International Institute for Education (IIE) and BEA data

International Patients, Cleveland Clinic (<https://www.clevelandclinic.org/heartcenter/pub/appointment/internationalpatients.asp?firstCat=88&secondCat=461>)

Table 5. Emerging markets present opportunities for entry and expansion

Rank BICs share of exports	Metro	BICs share of exports	Growth in exports to BICs (2003- 2008)	Industry contributing most to metro exports to BICs	Industry's share of exports to BICs
8	Madison, WI	9.8%	116.4%	Chemical Manufacturing	17.9%
10	Indianapolis-Carmel, IN	9.6%	104.4%	Chemical Manufacturing	47.8%
18	Buffalo-Niagara Falls, NY	9.2%	124.7%	Chemical Manufacturing	33.1%
26	Rochester, NY	9.0%	78.6%	Machinery Manufacturing	26.4%
28	Syracuse, NY	9.0%	113.8%	Chemical Manufacturing	14.0%
35	Akron, OH	8.8%	105.8%	Chemical Manufacturing	19.1%
44	St. Louis, MO-IL	8.7%	88.2%	Chemical Manufacturing	20.2%
46	Des Moines-West Des Moines, IA	8.7%	135.1%	Machinery Manufacturing	27.6%
47	Milwaukee-Waukesha-West Allis, WI	8.7%	119.4%	Machinery Manufacturing	25.1%
49	Pittsburgh, PA	8.7%	59.1%	Chemical Manufacturing	15.7%
54	Cincinnati-Middletown, OH-KY-IN	8.6%	120.1%	Transportation Equipment Manufacturing	23.2%
55	Cleveland-Elyria-Mentor, OH	8.6%	99.4%	Chemical Manufacturing	18.6%
59	Dayton, OH	8.5%	95.0%	Transportation Equipment Manufacturing	28.5%
60	Columbus, OH	8.5%	136.2%	Transportation Equipment Manufacturing	26.2%
61	Louisville-Jefferson County, KY-IN	8.5%	101.8%	Transportation Equipment Manufacturing	21.0%
63	Grand Rapids-Wyoming, MI	8.5%	74.7%	Transportation Equipment Manufacturing	31.9%
67	Minneapolis-St. Paul-Bloomington, MN-WI	8.4%	106.2%	Computer and Electronic Product Manufacturing	16.0%
71	Youngstown-Warren-Boardman, OH-PA	8.4%	124.1%	Primary Metal Manufacturing	37.4%
73	Chicago-Naperville-Joliet, IL-IN-WI	8.4%	117.2%	Chemical Manufacturing	17.2%
82	Toledo, OH	8.2%	101.4%	Transportation Equipment Manufacturing	35.1%
84	Detroit-Warren-Livonia, MI	8.2%	69.5%	Transportation Equipment Manufacturing	49.6%
	Great Lakes metros	8.6%	100.6%		
	Top 100 metros	8.6%	122.7%		

these markets. (See table 5.)

Chicago, Pittsburgh, and Rochester all count China as one of the five most important markets for their main export industry of machinery manufacturing, and China is the fourth most critical destination for Youngstown's dominant steel export industry.

Policy Implications

The federal government has a significant role to play in bolstering U.S. exports through setting trade and currency policies. The value of the dollar compared to other currencies is a critical factor in the success of U.S. exports. All of the metropolitan and state recommendations below need to be backed by a fundamental federal commitment to fair currency valuation.

States also have work to do in developing their own export strategies, driven by performance indicators and data that pinpoints promising new export sectors and explains why current levels of exports might be lagging. As a first step, states should make the budget and size of their own export promotion programs readily available, and focus on collecting data by location of production. More detailed recommendations for state and federal officials can be found in the full version of the Export Nation report on which this brief is based, available at <http://www.brookings.edu/metro/exports>.

Metropolitan areas, though, cannot wait for the federal and state governments. They have to take steps on their own to understand their export strengths and bolster their competitiveness. While Export Nation lays out an array of ideas for individual metros, this report will focus on just one, a metropolitan export initiative.

Each Great Lakes metro (like each metro in the U.S.) should develop its own initiative to boost metropolitan exports. This undertaking could be led by the local economic development entity, the chamber of commerce, or other group, but would draw on the resources and expertise of the public and private sectors. The effort should start by creating a clearinghouse for data collection and analysis on exports, using surveys, publicly available data, and research like that in Export Nation to achieve a clear understanding of the metro area's strengths and its current and potential export markets. Great Lakes metros should make sure that their export initiatives reach out to universities and firms that provide business, professional, and technical services.

A metropolitan export initiative should complement efforts to identify and strengthen metropolitan industry clusters. The groups that participate in the export strategy should partner with or otherwise support private sector and non-profit sector organizations that provide cluster support services, such as industry-specific training, market intelligence, and loans.²³ They could also encourage existing clusters to create an export strategy as part of their development plan and to learn from the export-boosting strategies deployed by groups like the Bay Area Council Economic Institute and the Trade Development Alliance of Greater Seattle.

A metropolitan-wide undertaking to increase exports would be a new approach to economic development, one better suited to 21st century imperatives than the desperate and self-defeating smokestack chasing efforts that metropolitan areas too often engage in. Mayors and metro leaders should understand that the competition is not between U.S. places, and certainly not between jurisdictions within a single metropolitan area, but with metro areas abroad. Instead of pursuing economic development strategies focused on luring new businesses into their metros, mayors and other metro leaders should help existing local firms take advantage of new opportunities in international markets.

Conclusion

The metropolitan areas of the Great Lakes region are among the most globally engaged metros in the country. They produce goods and offer services that are in demand around the world, particularly in rapidly emerging markets like Brazil, India, and China. A national effort to double exports in the next five years holds great promise for these metros that are already fairly export-oriented. But this opportunity may be squandered if Great Lakes metros do not focus intensely on innovation, both in terms of expanding the range of products and services that they offer and in their specific product and service lines. A legacy of success in exports does not guarantee future dominance, a lesson that Great Lakes metros should have learned through rough experience.

But raising exports holds out the promise of creating thousands of new jobs in Great Lakes metros that desperately need them. If the Great Lakes metros can create and then relentlessly recreate the products and services the world demands, more of their people can enjoy the benefits of a globalized economy, rather than suffering from its rigors.

APPENDIX

Methodology

Before this report, if one wanted to measure exports from metropolitan areas, the only public resource was the International Trade Administration's metropolitan exports series, which is based on the Census Bureau's origin of movement exports data. There are two problems with this dataset. First, it excludes services, which account for roughly one third of US exports. Second, as the ITA points out on its website, its data do not necessarily reflect where goods are produced; rather, the "origin of movement" is likely to often reflect where the goods are shipped from before reaching their final port of exit.

To generate estimates of metropolitan exports, the general technique used for this paper was to allocate U.S. exports in individual industries to metropolitan areas based on the metropolitan areas' share of national value added in each of those industries. This approach assumes that if Indianapolis produces 10 percent of the national value added in chemical manufacturing, then this metro area also exports 10 percent of U.S. chemical manufactures. In the case of trading partners, this method apportions U.S. exports in a particular industry sold to a particular country to each of the 100 largest metro areas proportional to the metro's share of national output in that same industry. So, in the hypothetical Indianapolis example, if the U.S. exported \$200 million to Turkey in chemical manufacturing in 2008, and Indianapolis accounted for 10 percent of U.S. value added in that industry, Indianapolis would be credited with exporting \$20 million (i.e. 10 percent) to Turkey in chemical manufacturing. Thus, a metro's rank for share of exports in a particular industry to a particular U.S. trading partner is the same as that metro's overall ranking in exports in that industry.

As discussed in greater detail in *Export Nation*, there are three pieces of evidence that the Brookings exports data estimate more accurately the true value of exports produced in metropolitan areas than the ITA data. First, metropolitan areas in states that border Mexico or Canada are accredited with significantly more exports per dollar of GMP using the ITA data than they are with the Brookings data, and the share of employment in manufacturing is unrelated to export orientation using the ITA data but significantly related to export orientation using the Brookings data. Second, the ITA data contradicts information from the Department of Transportation's Commodity Flows Survey on shipments of goods out of metros, with which the Brookings data are consistent. And third, for 15 out of the 100 metros studied here the ITA data tabulates goods exports that exceed in value all goods produced in the metropolitan areas; this never happens with the Brookings data.

The sources of data used by Brookings to generate the exports series were the USITC, the BEA, Moody's Economy.com, the IIE, and the IRS. The export data for each of the 100 largest metropolitan areas is available at <http://www.brookings.edu/metro/exports>.

Endnotes

- 1 This brief relies on new data and analysis performed for and explained in more detail in *Export Nation: How U.S. Metros will Lead National Export Growth and Boost Competitiveness*, by Emilia Istrate and Jonathan Rothwell. While that paper describes the export strengths of the top 100 U.S. metropolitan areas as a whole, this report focuses on the 21 metropolitan areas in the Great Lakes region: Akron, Buffalo, Chicago, Cincinnati, Cleveland, Columbus, Dayton, Des Moines, Detroit, Grand Rapids, Indianapolis, Louisville, Madison, Milwaukee, Minneapolis, Pittsburgh, Rochester, St. Louis, Syracuse, Toledo, and Youngstown. A detailed profile of the exports of each of these metropolitan areas can be found at <http://www.brookings.edu/metro/exports>. Kenan Fikri and Dan Weaver provided crucial and gracious research assistance.
- 2 President Obama, Address before a joint session of the Congress on the state of the union, January 27, 2010
- 3 Jeffrey Frankel and David Romer, "Does trade cause growth?" *American Economic Review* (89) (1999): 379–399; Romain Wacziarg and Karen Horn Welch, "Trade Liberalization and Growth: New Evidence," *The World Bank Economic Review* 22 (2) (2008): 187-231; Simon Kuznets, *Modern Economic Growth* (New Haven: Yale University, 1966).
- 4 Bee-Yan Aw, Mark J. Roberts, Tor Winston, "Export Market Participation, Investments in R&D and Worker Training, and the Evolution of Firm Productivity" *World Economy*, 30 (1) (2007): 83-104.
- 5 To elaborate on the point, in his famous treatise on economic development, Adam Smith argued that a nail maker in a village in Scotland would have the capacity to make 300,000 nails in a year, if this was his primary activity. But there is no market for that many nails in his village, so he can only sell 1,000 nails in a year and must split his time in other fields of smithery. He has no incentive to increase the productivity of his nail making business because he can't trade with enough people. Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* (London: Methuen & Co., Ltd, 1904/1776).
- 6 Alexander Mas, "Testimony Before the Senate Committee on Finance" Hearing on Exports' Place on the Path to Recovery (December 2, 2009), available at <http://finance.senate.gov/imo/media/doc/120909amtest1.pdf>
- 7 Andrew B. Bernard and Bradford J. Jensen, "Exceptional Exporter Performance: Cause, Effect, or Both?" *Journal of International Economics*, 47 (1) (1999): 1-25.
- 8 Lawrence Summers, "Auto Communities and the Next Economy," remarks delivered at the Partnerships in Innovation Conference, May 18, 2010, available at <http://www.whitehouse.gov/administration/eop/nec/speeches/auto-communities-next-economy>
- 9 UN Department of Economic and Social Affairs, *Global Urbanization Rate from 1950 to 2050*.
- 10 To generate estimates of metropolitan exports, the general technique was to allocate U.S. domestic exports for individual industries to metropolitan areas based on the metropolitan areas' share of national value added for each of those industries. The level of export-related jobs was estimated based on the contribution of industry exports to industry GMP for each metropolitan area. This ratio, which one could call the metropolitan export intensity of the industry, was multiplied by the number of jobs in each metropolitan industry to yield the number of export-related jobs, estimating the number of workers in each industry within a metropolitan area that are required to produce that industry's exports. A detailed discussion of the methods that generated these findings can be found in the methodology section of "Export Nation"; see also the Appendix.
- 11 Bee-Yan Aw, "Accumulating Technology and Location Spillovers Among Firms in Taiwan's Electronics Industry," *The Journal of Development Studies* 39 (1) (2002): 94-117.
- 12 Jennifer Bradley and Richard Shearer, "Great Lakes Monitor: Tracking Economic Recession and Recovery in the 21 Largest Metropolitan Areas of the Great Lakes Region," June 2010, available at http://www.brookings.edu/~media/Files/Programs/Metro/metro_monitor/2010_06_metro_monitor/2010_06_great_lakes_monitor.pdf
- 13 It turns out that there is a negative but insignificant correlation between export orientation and changes in GMP growth since the pre-recession peak for the 100 largest metropolitan areas, but the correlation is even more negative in the region and significant if no other factors are considered. Some might see this as evidence that export reliance has put the region at greater risk, but without international buyers, the region's metropolitan areas would have been hit even harder. Patents per worker measured as: (patents granted between 2001-2008) / ((employment in 2001 + employment in 2008)/2)

14 Bureau of Labor Statistics, "Career Guide to Industries, 2010-2011 Edition: Steel Manufacturing," available at <http://www.bls.gov/oco/cg/cgs014.htm>. See also Howard Wial and Alec Friedhoff, Bearing the Brunt: Manufacturing Job Loss in the Great Lakes Region, 1995-2005. (Washington: Brookings Institution, 2006). Wial and Friedhoff note that, "The combination of manufacturing output growth and manufacturing job losses [in Great Lakes states from 1995-2005] occurred because productivity improved more rapidly in manufacturing than in the rest of the economy."

15 This report used new patent data from the Strumsky Patent Applications Database, which aggregates and classifies historic and current patent information from the U.S. Patent and Trademark Office by geography. Patents per worker measured as: (patents granted between 2001-2008) / ((employment in 2001 + employment in 2008)/2)

16 To test this formally, the metropolitan export share of GMP was regressed on the 2008 manufacturing share of employment and the patent rate from 2001 to 2008, adjusting for state fixed effects. The relationship between patent rate and export share of GMP was highly significant, with a t-statistic of 3.8. This relationship was robust to including the share of employees working for universities, the share of employment in marine cargo handling, and the number of oil and coal fields in the metropolitan area. WTO, International Trade Statistics 2009.

17 U.S. Bureau of Economic Analysis (BEA), International Economic Accounts, Trade in Goods and Services (U.S. Department of Commerce, 2010) and WTO, International Trade Statistics 2009.

18 WTO, International Trade Statistics 2009.

19 Bureau of Economic Analysis, Cross Border Trade in Services.

20 The data on share of population over the age of 25 with a bachelor's degree comes from Alan Berube and others, The State of Metropolitan America. (Washington: Brookings Institution, 2010), specifically from the interactive State of Metropolitan America Indicator Map, available at http://www.brookings.edu/metro/StateOfMetroAmerica/Map.aspx#/?subject=8&ind=75&dist=0_0&data=Number&year=2008&geo=metro&zoom=0&x=0&y=0

21 Wial and Friedhoff note that service jobs grew from 1995 to 2005 in Great Lakes metros, but their growth was not sufficient to offset the loss in manufacturing jobs.

22 Calculation based on IMF, International Monetary Fund, World Economic Outlook Database, (April 2010).

23 Karen Mills, Elisabeth B. Reynolds, and Andrew Reamer, Clusters and Competitiveness: A New Federal Role for Stimulating Regional Economies (Washington: Brookings Institution, 2008).

About the Metropolitan Policy Program at the Brookings Institution

Created in 1996, the Brookings Institution's Metropolitan Policy Program provides decision makers with cutting-edge research and policy ideas for improving the health and prosperity of cities and metropolitan areas including their component cities, suburbs, and rural areas. To learn more visit: www.brookings.edu/metro

The Great Lakes Economic Initiative

Launched in 2005, the Great Lakes Economic Initiative (GLEI) focuses on how federal policy can advance the economic vitality of the nation's metros. The GLEI pays particular attention to the unique challenges and opportunities faced by communities within the Great Lakes/Industrial Midwest region. Over the next several years, GLEI research and policy activities will closely align with the shifting economic and fiscal trends, environmental imperatives, and political opportunities affecting the region, focusing particularly on the older industrial metros most impacted by the transition of the auto industry. By doing so, we hope to help create a new era of productive, inclusive, and sustainable growth for Great Lakes communities and their residents. Learn more at www.brookings.edu/projects/great-lakes.aspx

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