

# Export Nation 2012: How U.S. Metropolitan Areas Are Driving National Growth

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## Findings

An analysis of the production location of U.S. exports—particularly in the nation's 100 largest metropolitan areas between 2009 and 2010—reveals that:

- **U.S. exports grew rapidly in the first year of the nation's economic recovery.** Specifically, U.S. export sales grew by more than 11 percent in 2010 in real terms, the fastest growth since 1997. In terms of job creation, the number of U.S. total export-supported jobs increased by almost 6 percent in 2010, even as the overall economy was still losing jobs.
- **Large metropolitan areas powered the nation's export growth.** Taken together, the largest 100 metro areas produced almost 65 percent of U.S. export sales in 2010, three-quarters of the nation's service export sales and 63 percent of manufacturing export sales. The largest 100 metropolitan areas produced the majority of export sales in 30 states in 2010. Export sales from Midwestern metro areas generated the fastest growth in direct export-production jobs.
- **The Great Recession accelerated the shift of U.S. exports toward developing countries.** Canada and Mexico remain the largest export markets for the United States, with one-quarter of the U.S. goods and service exports sold to the North American Free Trade Agreement (NAFTA) trading partners in 2010. From 2003 to 2008, the share of U.S. exports going to Brazil, India and China (the so-called BIC countries) increased by 3 percentage points and by another 2 percentage points in just the two years from 2008 to 2010. Metropolitan areas that produce what emerging markets consume are better-positioned to take advantage of the growth in these countries.
- **Manufacturing drove the export resurgence in 2010.** Comprising about 61 percent of U.S. exports, manufacturing industries produced three-quarters of the nation's additional sales abroad between 2009 and 2010. The rapid growth in manufacturing exports led 11 metropolitan areas to achieve 2009–2010 export growth rates that, should they continue, would double their exports in five years.
- **High-value-added service exports witnessed uninterrupted growth through the recession and recovery.** U.S. service exports such as education, telecommunications services, and business services grew in both 2009 and 2010. The largest 100 metropolitan areas produced more than 75 percent of these high-value-added service exports.

The federal National Export Initiative should look to burgeoning regional export efforts to advance its goal, while metropolitan leaders need to reinforce links with their trading partners. Only a federalist division of labor among levels of government, in conjunction with the private sector, can truly help U.S. companies export more and, in the process, create jobs in the United States.

## Introduction

The Great Recession reset the world economic map. Suddenly, with the bulk of the world's economic growth transferred beyond the borders of a recession-mired West and into emerging markets, American metropolitan areas and the nation as a whole were left to cast about for new sources of growth.<sup>1</sup>

Such a search for growth is why, in the months after the crash, a chorus of business leaders and economists called for a new emphasis on exports in a "rebalanced" American economy. It is why, too, that President Obama—recognizing the power of exports to help reorient the American economy after the recession—launched the National Export Initiative (NEI) in March 2010, with the goal of doubling exports by the end of 2014. And it is also why the Metropolitan Policy Program at Brookings published in summer 2010 the initial edition of "Export Nation"—a first-of-its-kind analysis of both goods and services exports at the metropolitan level in the United States during the period from 2003 to 2008.<sup>2</sup> That report provided a new "bottom-up" view of the U.S. export enterprise as well as a new view of how individual regions link to other nations.

This second edition of "Export Nation" updates and builds upon the results of the first analysis to examine changes across the metropolitan export landscape in 2010, the first year of the nation's economic recovery.

It also extends its predecessor's tracking of export growth, export-supported jobs growth, and industry trends, and it documents the rapid growth of emerging markets among U.S. export destinations.

As the last two years have been active ones on the export front—federally and at the state and metropolitan level—the present report also furnishes the opportunity for an update on the nation's expanding policy and economic development engagement with exporting.

Most notably, the Obama administration is now deeply involved in implementing the NEI especially on trade and export promotion activities.<sup>3</sup> Through the new State Trade and Export Promotion Program (STEP), the federal government provided additional support to the states in their efforts to increase exports. The planned consolidation of six federal departments and agencies could help further reorganize and better maximize the federal effort on exports.<sup>4</sup> Congress also passed free trade agreements (FTAs) with Korea, Colombia, and Panama in 2011.

In response to the NEI, four metropolitan areas (Los Angeles; Minneapolis-Saint Paul; Portland, OR; and Syracuse) moved to develop their own Metropolitan Export Initiatives (MEIs) in 2011, with the support of the Brookings Institution Metropolitan Policy Program. These initiatives are something new: ground-up collaborative efforts by regional business, civic, and political leaders to create and implement strategic plans for boosting exports in U.S. regions. For its part, the U.S. Conference of Mayors recently issued a special metro export challenge, which will likely ignite the creation of dozens of additional MEIs around the country.

Increasingly, it is being recognized that exporting is in large part a metropolitan enterprise and that focused, effective export promotion initiatives in U.S. metropolitan areas provide an important tool for delivering on the NEI, given that metropolitan areas in the United States delivered some 84 percent of the nation's exports in 2010.

Along those lines, the report for the first time analyzes the role of metropolitan areas in state exports. Further, "Export Nation 2012" extends the geographical and industrial detail of the earlier metropolitan export estimates, providing fine-grained metro-scaled descriptions of the size, growth-rates, industrial composition, and employment of the export sector in 2010. Accompanying the trend data analysis, meanwhile, this second edition of "Export Nation" provides a series of policy recommendations on how to ensure that the NEI supports and makes the best use of the metro initiatives.

A few notes are in order, finally, about the timeliness and comparability of the new information. First, it bears noting that this study reflects a one-year lag in metropolitan exports estimates. This is because the U.S. Bureau of Economic Analysis will issue the full dataset of 2011 U.S. exports, including data on exports of goods and services by trading partner (the International Transactions), after the release of this report. It should be noted also that the U.S. Bureau of Economic Analysis will release estimates of 2011 U.S. export services such as education, financial services, and business services in October 2012. Second, while this report offers an "update" on the earlier report, the 2008 estimates and largest 100 metro rankings from the first edition of "Export Nation" are not comparable with the

2008 export estimates and rankings provided in this study. This owes to the fact that during the last two years some of the primary data sources used in this study—including the Bureau of Economic Analysis (BEA) and Moody's Analytics—revised their historical estimates. In 2011, at the subnational level BEA changed its methodology for estimating service exports, which affects the estimates of service export categories. In addition, this study improved on the estimation of three service exports (education, royalties, and travel and tourism), which combined with the BEA revised service export estimates, render unfeasible the comparison of service exports data with the previous edition. Last, this study changes the methodology for estimating export jobs.

In any event, the data and discussion presented here should provide useful information for all of those engaged in the nature and expansion of the nation's U.S. export enterprise. The results from the second edition of "Export Nation" can assist metropolitan leaders, media, and the public to better understand the export sector in metropolitan areas and the states, and help to build a knowledge base to better tap foreign demand for goods and services.

## Data and Methods

**A**mid numerous export and trade data sources, this study is unique in several ways.<sup>5</sup> First and foremost, it estimates U.S. exports by production location, and not origin-of-movement, as is the norm with all the other available export databases. The origin-of-movement is not always the place where the good was produced, especially when the exported goods get consolidated along the shipment route. Origin-of-movement export data are sufficient for a freight study, but they provide a distorted view for regional economic analysis.

Second, this report is unique because it estimates exports at the county level, which allows aggregation at the metropolitan, state, and national levels. While the focus of this report is the analysis of U.S. exports produced in the largest 100 metropolitan areas, the geographically detailed data allow a better understanding of the places of production of state exports. The U.S. Census Bureau produces a state exports series and prepares a metropolitan export series for the International Trade Administration (ITA), but these series reflect origin-of-movement export data.

Finally, "Export Nation" estimates exports of both goods and services at the sub-national level for 34 major export categories, 26 for goods and eight for services (For the complete list, see Appendix A). This is more comprehensive than the Census Bureau's state and metropolitan exports series covering only goods exports, for which the federal agency collects shipment data. The U.S. Bureau of Economic Analysis releases service export estimates, but only at national level. Some state export promotion offices, such as Enterprise Florida, generate their own estimates of services exports for their state.<sup>6</sup>

Turning to the methodology utilized here, this second edition of "Export Nation" largely follows the methodology developed in the previous edition (For more on the changes introduced in the 2012 update, see Appendix A).<sup>7</sup>

As did the earlier edition, the estimation technique employed here allocates U.S. exports to a county based on an industry's national export intensity and the county GDP. This approach assumes that if Los Angeles County produces 5 percent of the national value-added of computer manufacturing, then this county also exports 5 percent of U.S. computer and electronics. In the case of trading partners, this method apportions the U.S. exports of an industry sold to a particular country to each of the U.S. counties in proportion with the county share of output produced by that same industry to the national total. So, in the hypothetical Los Angeles County example, if the United States exported \$100 billion to China in computer and electronics in 2010, Los Angeles County would be credited with exporting \$5 billion (i.e. 5 percent) to China in computer and electronics in 2010 (For more detail, see Appendix A).

This methodology does not take into account different export propensities of metropolitan industries that produce similar shares of the industry's national output. For example, Florida's Brevard County is home to a large concentration of aerospace companies, much of whose production is for export markets, based on information from Enterprise Florida.<sup>8</sup> Another U.S. county with a similar-sized aircraft industry might serve more the domestic market, but this study would not capture the

## Key Terms Used in 'Export Nation'

This study focuses on the international trade side of regional exports. Therefore, it excludes the sales of a U.S. metropolitan area to other U.S. regional economies or of a U.S. state to another.

**U.S. exports** is total U.S. exports without waste, scrap, re-exports, used merchandise, goods returned to Canada, special classification provisions, military transfers, government services, and expenditures of foreign embassies and international organizations in the United States. This subset of exports of domestic goods (or merchandise) and private (or commercial) services can be identified by goods industry and type of service and it is comparable with this study's exports series estimated at sub-national level.

**Metropolitan exports** are sales of goods and services by U.S. resident firms located in one of the largest 100 metro areas to foreign entities (people or companies). The foreign entities include foreign firms located abroad (but no affiliates of foreign companies located in the United States), subsidiaries of American firms located abroad, foreign tourists and students in the United States, and foreign passengers on U.S. air carriers.

**State exports** are goods and services sold by U.S. resident firms located in one of the 50 U.S. states plus the District of Columbia to foreign entities (people or companies). The foreign entities include foreign firms located abroad (but no affiliates of foreign companies located in the United States), subsidiaries of American firms located abroad, foreign tourists and students in the United States, and foreign passengers on U.S. air carriers.

**Exports share of Gross Domestic Product (GDP)** or **export intensity** shows the importance of exports to the economy.

**The exports growth rate** is the annualized real growth rate of exports value for the periods 2003-2008 and 2009-2010, inflation-adjusted by industry.

**Direct export-production jobs** are jobs supported by exports in the industries producing the exported good or service. These are in the metropolitan area where the export is produced.

**Total export-supported jobs** include direct export-production jobs as well as jobs supported by exports in the suppliers to the exporting industry, and in the case of goods exports, in the transportation and wholesale trade industries. Some portion of these jobs lies outside the metro area producing the export and in other parts of the United States.

Measured by year-over-year GDP growth rate, 2010 is the **first year of recovery** in the United States.

different export intensities of the aircraft industry across the country. While not the optimal method to estimate metropolitan exports, this estimation technique provides more accurate estimates than the metropolitan exports series from ITA. For example, based on ITA exports data, the McAllen, TX metro area sold abroad \$1.7 billion worth of computer and electronics in 2009, which was 115 times larger than what the U.S. Bureau of Economic Analysis reported for the production of McAllen's computer and electronics industry in the same year. This study estimates \$10.8 million worth of computer and electronics originating from McAllen, in line with the production of this metro industry.<sup>9</sup>

To estimate the numbers of jobs supported by exports, however, this update employs a different technique than did in the first edition. The previous "Export Nation" estimated export-related jobs by multiplying the share of exports in the Gross Value-Added (GVA) of an industry by the employment of that industry. This method overestimated the number of jobs supported by exports, because it assumed the entire value of exports was produced in the United States and supported jobs there. However, U.S. exports incorporate foreign-value-added intermediate inputs. Specifically, about 12.9 percent of U.S. export value consisted of foreign-value-added in 2004, according to the U.S. International Trade Commission (See Box: A Value-Added View of Trade). In addition, the previous method assumed that the transportation and wholesale trade portion of the value of U.S. goods exports supported the same number of jobs as the production of goods exports.

This edition improves on the previous method by:

- Using annual job multipliers calculated by the U.S. Bureau of Labor Statistics (BLS), adjusted to

remove the employment effect of imports

- Calculating separately the jobs supported by the production, transportation, and wholesale trade involved in goods exports
- Estimating both the direct jobs supported by exports (jobs in the exporting industry) and the total job effect of exports, in the exporting industry, the supply chain, and, in the case of goods exports, in the transportation and wholesale industries. This study does not estimate the impact of spending for consumer goods by those people earning the income generated by the production of exported goods and services

Along these lines, this edition of "Export Nation" estimates two sets of export jobs data:

- Direct export-production jobs are jobs supported by exports in the industries producing the exported good or service. Because this study assigns metropolitan exports to the location of production, it locates the associated direct export-production jobs in the metropolitan area where the export is produced
- Total export-supported jobs, by contrast, reflect the broader employment impact of exports including direct export-production jobs; jobs with the suppliers of intermediate inputs to exporting industries; and, in the case of goods exports, associated jobs in the transportation and wholesale trade industries across the United States. Some of these jobs lie outside of the metro area that produces the exported good or service

In estimating these two jobs series, this study uses the annual job multipliers calculated by the U.S. Bureau of Labor Statistics (BLS), adjusted to remove the employment effect of imports.<sup>10</sup> For direct export-production jobs, the report employs the BLS job multipliers that show the number of direct jobs, full-time or part-time, supported by \$1 million worth of sales (valued in production prices) of the products of an industry. For total export-supported jobs, it employs the BLS job multipliers that show the number of direct and indirect jobs, full-time or part-time, supported by \$1 million worth of sales (valued in production prices) of the products of an industry. For example, \$1 million worth of sales (in production prices) of industrial machinery supported an average of 3.23 direct jobs in the United States 2010—these are jobs in the industrial machinery industry itself. The same amount of industrial machinery production supports on average 7.02 direct and indirect jobs in the United States in 2010—these are jobs in the industrial machinery industry and in any U.S. industry that provided inputs into the production of those commodities (For more details on this method, see Appendix A).

In the case of merchandise exports, this study calculates separately the jobs supported by the production, transportation, and wholesale trade involved in goods exports, because the BLS job multipliers do not reflect the employment effect of transportation costs and handling charges to transport commodities to final consumers. This report estimates production, transportation, and wholesale trade shares of goods exports based on the U.S. Bureau of Economic Analysis (BEA) 2002 detailed input-output table "Use of commodities by industries," the latest available detailed table.<sup>11</sup>

The only export for which this study does not use BLS multipliers is travel and tourism, which represents the combined

### A Value-Added View of Trade

U.S. investment abroad has contributed to the development of global supply chains, and as a result, the nature of exports has changed rapidly during the last decades. The divide between exports and imports is rapidly disappearing, which deeply affects the statistical estimates of exports, imports, and the trade balance. Take the case of car parts, for example, which can be produced somewhere in the United States; exported to Canada where they undergo some change; and then be sent back to the United States (imported), where they get assembled in cars that the U.S. exports around the world. Attributing the entire export value to the last exporting country (the United States) would be misleading, given that it incorporates inputs made in Canada. At the same time, it would also be erroneous to discount the entire value of imported car parts, given that part of that value was initially created in the United States.

There are several measures of the scope of the global supply chain activity in world trade, but the most extensive approach calculates trade based on value-added, as the value contributed to a product or a service by workers and companies in each country.<sup>12</sup> The U.S. International Trade Commission estimated the U.S. value-added of U.S. exports at 87.1 percent of gross exports in 2004. Based on the same calculations, the U.S.-China trade deficit on a value-added basis would be about 40 percent smaller than the official figure in 2004, given that China is the final assembler in several global supply chains and not the producer of many of the assembled inputs.<sup>13</sup>

Exports of services and agricultural products tend to have higher U.S. value-added, given the nature of their production or the later development of their global supply chains. For example, business service exports had 95.6 percent U.S. value-added in 2004. Applying these export U.S. value-added rates to 2010 metropolitan exports estimates by exporting industry provides an idea of the variability of the U.S. value-added in metropolitan exports. Metropolitan areas specialized in services, such as Des Moines, Las Vegas, and Washington, D.C. tend to have higher shares of U.S. value-added in their exports than the rest of the largest 100 metro areas.

expenditures of foreign tourists with the value of the passenger fares paid by foreign residents to U.S. air carriers for their flight to the United States. Instead of BLS multipliers, this report uses for direct export-production jobs the ratio of the BEA direct tourism employment over the direct output of U.S. travel and tourism (domestic and international). For total export-supported jobs, it divides the BEA total tourism employment (direct and indirect) over the direct output of U.S. travel and tourism. This method was adopted because travel and tourism is a heterogeneous industry for which BLS does not have a unique job multiplier.

This edition's export-supported jobs methodology improves on the export employment method employed in the previous edition. A panel data analysis for the 34 U.S. export categories, between 2003-2010, shows that the U.S. exports series has a stronger association with U.S. export jobs estimates based on the present job multiplier method (93.9 percent) than with the jobs estimates based on the method used in the previous edition (85.7 percent).

Most of the data sources employed in this study are the same with the previous edition: the United States International Trade Commission (USITC), the Bureau of Economic Analysis (BEA), the Bureau of Labor Statistics (BLS), the Internal Revenue Service (IRS), and Moody's Analytics. Instead of using the number of foreign students from the Institute of International Education, this update employs estimates of foreign students' expenditures from NAFSA: The Association of International Educators.

The second edition of "Export Nation" provides several other improvements from the 2010 study that yield increased geographical detail; state export estimates; extended timelines; higher levels of industrial detail; improved export-supported jobs estimates; and better education, royalties, and travel and tourism export estimates (For more detail, see Appendix A). (Also see Box: A Value-Added View of Trade).

In light of these improvements, the 2008 export estimates and rankings associated with this study are not comparable with the 2008 estimates and the largest 100 metro rankings from the first edition of "Export Nation." In addition, the Bureau of Economic Analysis (BEA) and Moody's Analytics have during the last two years revised the historical estimates they provide that this study employs. In 2011, BEA changed its methodology for estimating some service exports, which affects the estimates of service export categories. With all these changes, this second edition of "Export Nation" is an update of the previous report, because it uses the same core methodology in estimating metropolitan exports.

## Findings

### **1. U.S. exports grew rapidly in the first year of the nation's economic recovery.**

In the first two years of the NEI, exports were a major driver of the U.S. recovery. In 2010 and 2011, exports contributed more than 46 percent to the growth of the U.S. economy.<sup>14</sup> Nominally, total U.S. exports grew by more than 16 percent between 2009 and 2010, but the rate moderates to 11 percent, when adjusted for inflation.<sup>15</sup> Last year—2011—was another year of continued high export growth.<sup>16</sup> In addition, exports increased faster than the overall U.S. economy, which expanded at a 3 percent growth rate in 2010.<sup>17</sup>

Consequently, the U.S. economy has been rapidly becoming more export intensive over the last couple of years. Total 2010 U.S. exports, as a share of GDP, almost reached pre-recession levels. Further, based on the preliminary estimates of the U.S. Bureau of Economic Analysis, total U.S. exports, as a share of GDP, reached the highest level in 2011 since 1929.<sup>18</sup>

In terms of job creation, the rapid growth of U.S. export sales translated into significant job gains in 2010. Overall, the year saw the United States add 600,000 new export-supported jobs, meaning job gains not only in the exporting industries themselves but also by the suppliers of the exporting sector as well as the transportation and wholesale trade businesses hauling merchandise exports across the country.

Exports have a broad impact on the economy. Altogether, U.S. exports supported 10.7 million jobs by 2010—a figure still below the number of export-supported jobs in 2008 but increasingly robust.<sup>19</sup> About 52 percent of the total export-supported jobs were direct export-production jobs, meaning employment in industries that produce the actual goods and services exported. The rest of the nation's export-supported jobs were positions with the suppliers to the exporting sector and the transportation and wholesale trade businesses hauling merchandise exports.

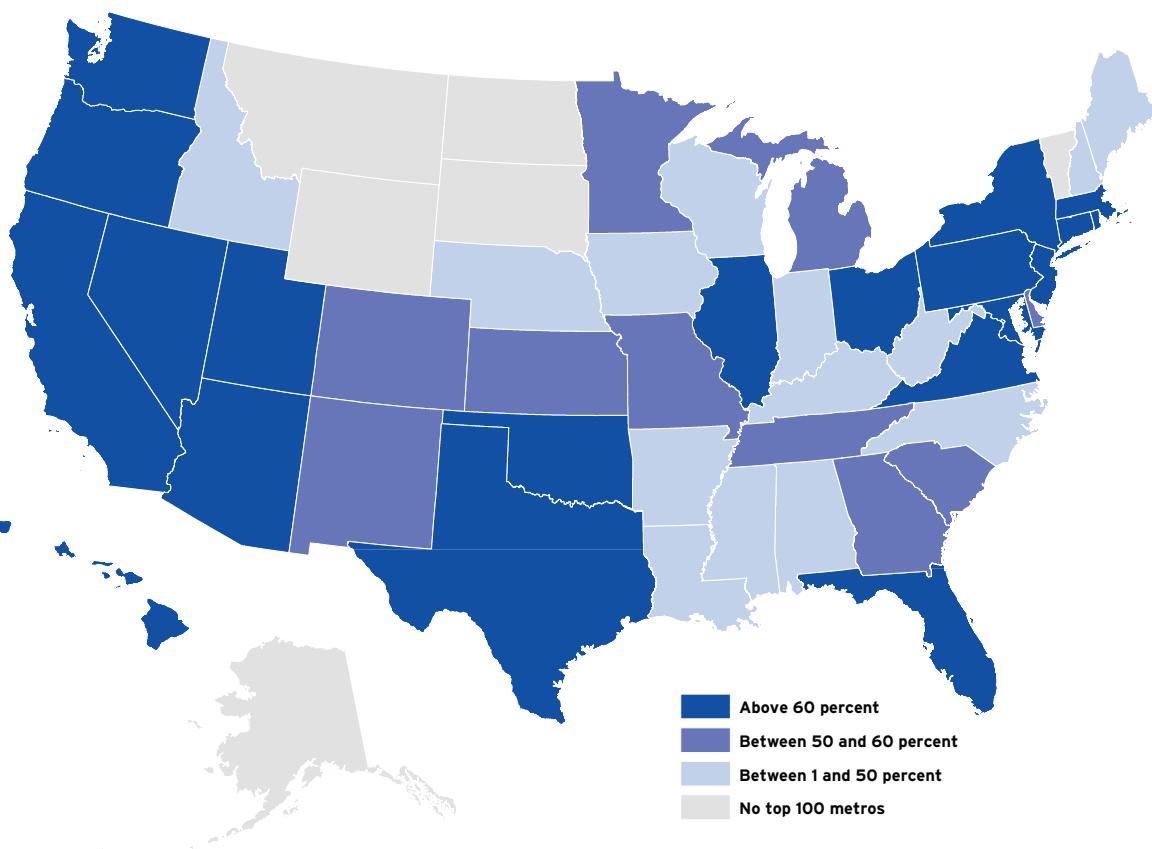
Overall, the United States remained the largest country exporter in the world and the number one exporter of private services in 2010. The United States became the second largest merchandise exporter in 2010, a spot higher than before the recession, as U.S. goods exports recovered faster than Germany's. As a result, the United States had a larger share of the world merchandise exports than Germany in 2010, according to the World Trade Organization.<sup>20</sup>

## **2. Large metropolitan areas powered the nation's export growth.**

Metropolitan areas in the United States delivered the majority of export sales in 2010. All U.S. metros generated 84 percent of U.S. export sales in 2010, including 84 percent of manufacturing and 90 percent of service exports. The largest 100 metro areas by population accounted for 65 percent of U.S. goods and services sold to foreign residents. The large metros' share increases to more than 75 percent of export sales when services are considered and moderates to 63 percent when manufactured goods are included.

Large metropolitan areas are the export powerhouses of the states, delivering the majority of export sales in 30 states in 2010 (See Figure 1). For example, metro areas among the 100 largest nationally by population generated 68 percent of Ohio's export sales. Further, large metropolitan areas delivered most of the export sales expansion in 27 states between 2009 and 2010. Metropolitan areas contributed less to state export sales growth between 2009 and 2010 than their share of state

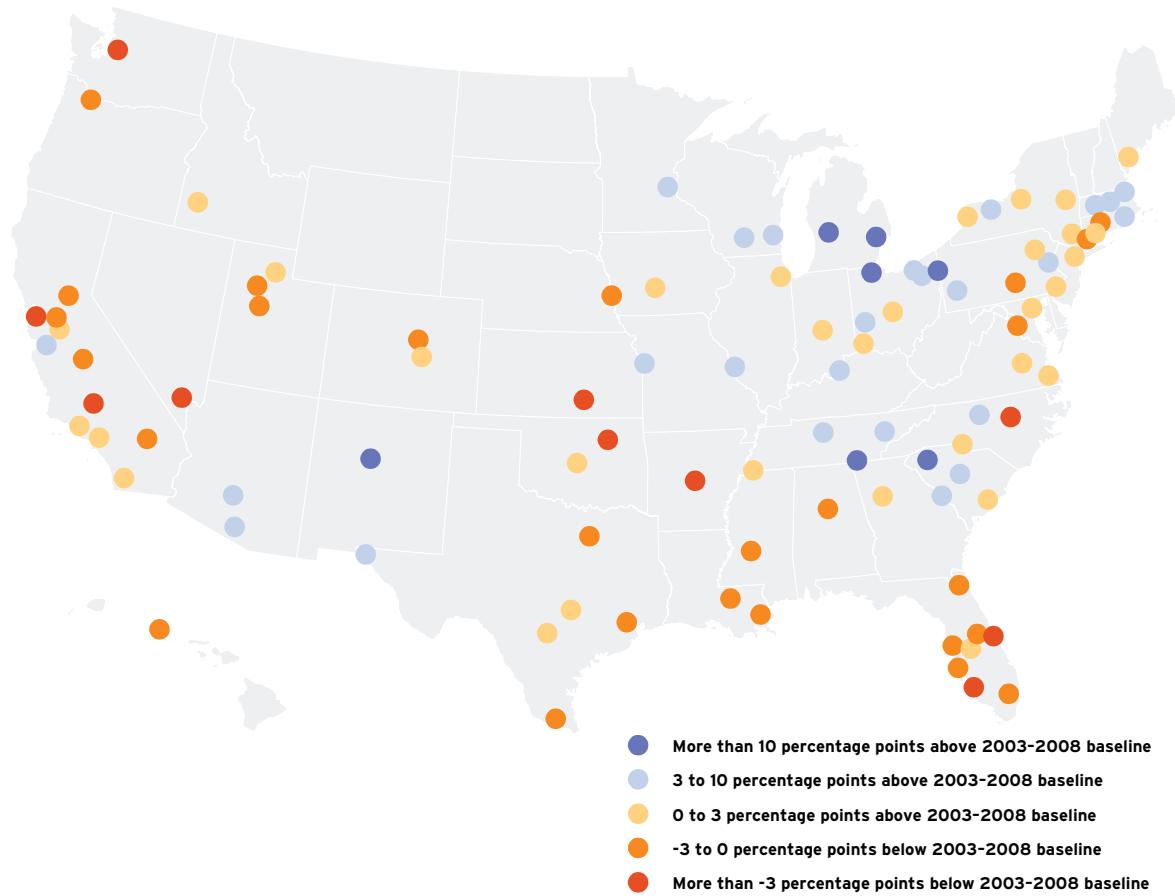
**Figure 1. Large Metropolitan Area\* Exports as a Share of State Exports, 2010**



Note: \*Large metropolitan areas rank among the largest 100 by population.

Source: Brookings analysis of data from BEA, BLS, IRS, Moody's Analytics, NAFSA, and USITC

**Figure 2. Export Growth Rate, Largest 100 Metro Areas, 2009-2010, Compared to Annualized 2003-2008 Export Growth Rate**



Source: Brookings analysis of data from BEA, BLS, IRS, Moody's Analytics, NAFSA, and USITC

export sales in 2010 in some states, because many of the fastest growing U.S. exports in the first year of recovery were commodities and raw materials, industries with a smaller footprint in metropolitan areas. However, this is not the case in all states. For example, 70.4 percent of Oregon's export sales came from Portland in 2010, and the Western metro area contributed 73 percent to the state export sales growth between 2009 and 2010.

All large metro areas witnessed positive growth rates in their export sales between 2009 and 2010. Youngstown topped the charts, and saw its exports grow by 30 percent in the first year of recovery. By contrast, Las Vegas—at the bottom of the rankings—managed just a 2.8 percent growth rate, driven by higher expenditures of foreign tourists. Forty out of largest 100 metros by population witnessed higher export growth rates than the nation in 2010. Midwestern metros are disproportionately represented in this group, with both large metros such as Chicago and Indianapolis and smaller metros (e.g. Youngstown and Toledo, OH).

In general much progress at expanding exports is being made. An important measure of the strength of the recovery, for example, is whether metropolitan areas surpassed their pre-recession rates of export sales growth in the first year of recovery. On this front, two-thirds of U.S. large metros surpassed their annualized 2003-2008 export growth rate in 2009-2010 (See Figure 2).<sup>21</sup> Manufacturing led the growth in metro areas that exceeded their pre-recession export sales growth rates by the largest margins. Midwestern and Northeastern metro areas are consistently above trend.

The solid growth of export sales in the large metropolitan areas is also driving the creation of jobs in large metros and across the country. Total export-supported jobs include direct export-production jobs (jobs in the industry producing the exported good or service); jobs among the suppliers of intermediate inputs to exporting industries; and, in the case of goods exports, in the transportation and wholesale trade businesses hauling merchandise exports. While direct export-production jobs are located in the metro area producing the exported good or service, total export-supported jobs lie in the exporting metro area and in other parts of the United States. For example, the sale abroad of a car produced in Detroit supports jobs not only in Detroit, but also in places producing car parts such as Troy, MI and Dearborn, MI, and in the port used to ship the cars abroad.

The export sales from the large metros supported most U.S. export jobs in 2010. The exporting industries from the large metro areas supported more than 67 percent of U.S. direct export-production jobs in 2010, including 62 percent of the jobs supported by the production of manufacturing sales abroad and more than 75 percent of the jobs supported by the production of services sold to foreign residents. Yet, the employment effect of export sales originating in the large metro areas goes beyond these metros' boundaries. The direct export-production jobs in the large metro areas represented only 54 percent of the total export-supported jobs sustained by the export sales from the large metros.

The big metro exporters supported the largest number of direct export-production jobs in 2010. New York commanded the top spot, its export sales supporting almost 329,000 jobs in the metro area in 2010 (See Table 1). Los Angeles was close behind, with a difference of 16,000 jobs. These are only a share of the broader employment impact that metro exports have in large metros and around the country. For example, Los Angeles' direct export-production jobs were almost 58 percent of the total job impact that Los Angeles export sales had in the United States in 2010. Los Angeles export sales support jobs not only in the exporting industries within its region, but also in the supply chains of its exporters, and in the transportation and wholesale companies handling its export business located in Los Angeles and in other parts of the United States.

**Table 1. Export-Supported Jobs, Largest 100 Metro Areas, 2010**

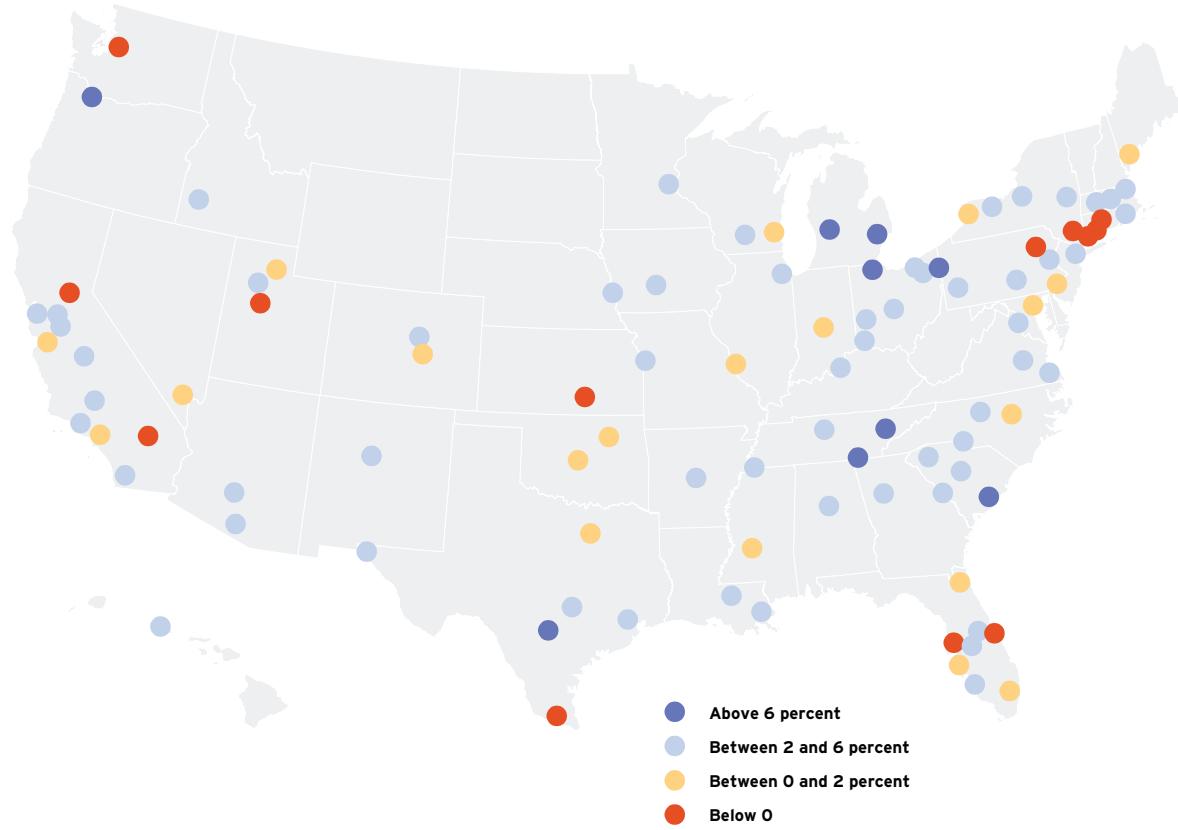
Rank, Direct Export-Production	Metropolitan Area	Direct Export-Production Jobs, 2010 (thousands)	Direct-Production Jobs' Share of Total Export-Supported Jobs
1	New York-Newark, NY-NJ-PA	329.0	61.0%
2	Los Angeles-Long Beach-Santa Ana, CA	312.7	57.8%
3	Chicago-Naperville-Joliet, IL-IN-WI	197.6	52.5%
4	Dallas-Fort Worth-Arlington, TX	147.2	52.6%
5	Houston, TX	141.3	46.0%
6	Boston-Cambridge, MA-NH	118.9	60.7%
7	San Francisco-Oakland-Fremont, CA	110.0	56.6%
8	Seattle-Tacoma-Bellevue, WA	104.4	55.4%
9	Washington-Arlington-Alexandria, DC-VA-MD-WV	100.2	68.5%
10	Philadelphia, PA-NJ-DE-MD	97.0	55.7%
<b>Largest 100 Metropolitan Areas</b>		<b>3,731.5</b>	<b>54.1%</b>

*Notes: Direct export-production jobs are jobs supported by exports in the industries producing the exported good or service. These are in the metropolitan area where the export is produced.*

*Total export-supported jobs include direct export production jobs as well as jobs supported by exports in the suppliers to the exporting industry, and in the case of goods exports, in the transportation and wholesale trade industries. Some portion of these jobs lie outside the metro area producing the exports and in other parts of the United States.*

*Source: Brookings analysis of data from BEA, BLS, IRS, Moody's Analytics, NAFSA, and USITC*

**Figure 3. Direct Export-Production Jobs Growth Rate, Largest 100 Metro Areas, 2009-2010**



*Notes: Direct export-production jobs are jobs supported by exports in the industries producing the exported good or service. These are in the metropolitan area where the export is produced.*

*Source: Brookings analysis of data from BEA, BLS, IRS, Moody's Analytics, NAFSA, and USITC*

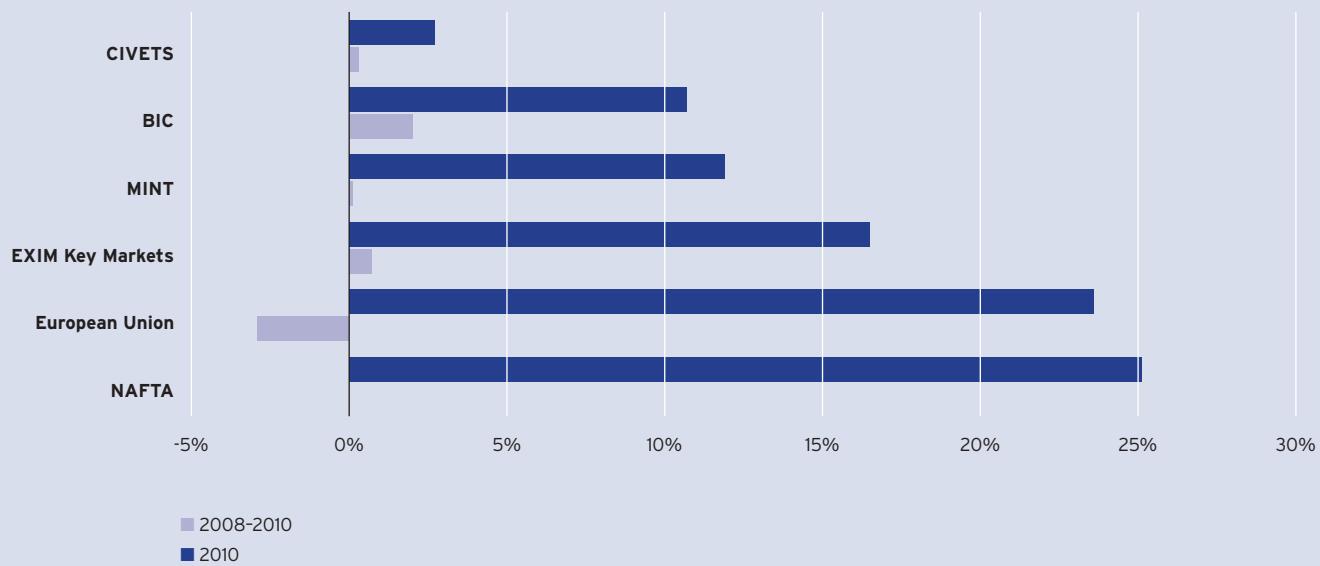
Exporting industries across large metros supported more jobs in 2010, but Midwestern metros stood out in terms of the high growth rate of their direct export-production jobs. The exporting industries in Midwestern metros added more than 23,000 direct export-production jobs in 2010, second only to Southern metros (almost 30,700 jobs). This was a 3.4 percent increase from 2009, more than the average of the large metro areas (See Figure 3). Manufacturing export sales delivered almost one-half (48 percent) of this direct export-production jobs growth in Midwestern metros. In metros such as Youngstown and Detroit, higher sales abroad of transportation equipment led to the largest direct export-production job gains.

### **3. The Great Recession accelerated the shift of U.S. exports toward developing countries.**

The shift of global economic activity to developing countries has been accelerating over the last two years. The slow growth and other economic troubles being experienced by the European Union (EU), United States, and Japan, juxtaposed with the continued expansion in emerging markets, has resulted in a “two-speed recovery” worldwide.<sup>22</sup> According to International Monetary Fund projections, for example, Brazil, India, and China (the so-called BIC countries) surpassed the United States, in their combined share of world GDP in the middle of the global recession in 2009.<sup>23</sup> New markets are now critical.

U.S. exports fully reflect this shift in economic growth across the world. From 2003 to 2008, the share of U.S. exports to the BIC countries increased by 3 percentage points, but then grew by another

**Figure 4. U.S. Exports to Main Country Groups, as a Share of U.S. Exports, 2010 and Change in Share, 2008-2010**



Note: CIVETS is Colombia, Egypt, Indonesia, South Africa, Turkey, Vietnam; BIC is Brazil, India and China; MINT is Mexico, Indonesia, Nigeria and Turkey; EXIM Key Markets are the foreign markets targeted by the U.S. Export - Import Bank: Brazil, Colombia, India, Indonesia, Mexico, Nigeria, South Africa, Turkey, and Vietnam; European Union refers to all 27 members; and NAFTA is Canada and Mexico.

2 percentage points in just the two years between 2008 and 2010 (See Figure 4). While the share of the exports that flowed to America's North American Free Trade Agreement (NAFTA) partners, Canada and Mexico, remained unchanged at 25 percent of the U.S. exports in 2010, the share of U.S. exports to the European Union (EU) slipped by 3 percentage points.

The BICs contributed disproportionately to U.S. exports growth after the recession. While comprising only 10.7 percent of U.S. exports in 2010, U.S. exports to the BICs represented 20 percent of the export growth between 2009 and 2010. China alone delivered more than 13 percent of U.S. export growth in the first year of recovery. In contrast, exports to the European Union (EU) declined by 0.8 percent.

Exports to the BICs, in fact, grew twice as fast as U.S. exports overall in 2010 (24 percent), fueled by sales of chemicals and machinery. However, U.S. sales did not expand at the same pace across the BIC countries. Exports to China and India grew in double digits, but sales to India grew by 5.6 percent, less than the national average. Plummeting sales of aircraft and aircraft parts—which decreased by 44 percent—were a major contributor to the weakness of U.S. exports to India in the first year of recovery.

Manufacturing revived U.S. exports to the BICs. Transportation equipment (more specifically, sales of motor vehicles such as cars, utility vehicles, light- and heavy-duty trucks) led the U.S. export growth to China, delivering 13.2 percent of U.S. export growth to China between 2009 and 2010. U.S. exports of chemicals to Brazil registered the largest additional sales among the 34 export categories in the first year of recovery; some 62 percent of these chemicals sold to Brazil were basic chemicals and pharmaceuticals. In India's case, it was metal manufacturing that delivered 36 percent of the increase in U.S. exports, mainly through increased shipments of refined copper and other nonferrous metals.

Looking at the geography of such export flows, it is clear that the metropolitan areas that produce goods in demand among the BIC nations are well-positioned to take advantage of the growth of these countries.

Midwestern metro areas dominate the list of the top 10 large metro exporters of motor vehicles to China in 2010 (See Table 2). Detroit held the largest spot, with more than 16 percent of U.S. motor vehicles sales to China, followed distantly by Dallas.

**Table 2. Largest 10 Metropolitan Exporters of Motor Vehicles to China, 2010**

<b>Metropolitan Area</b>	<b>Motor Vehicles Exports to China, 2010 (mil \$)</b>	<b>Share of U.S. Motor Vehicles Exports to China</b>
Detroit-Warren, MI	517.2	16.4%
Dallas-Fort Worth-Arlington, TX	105.7	3.4%
Louisville-Jefferson County, KY-IN	50.1	1.6%
Virginia Beach-Norfolk-Newport News, VA-NC	48.4	1.5%
St. Louis, MO-IL	41.3	1.3%
Columbus, OH	39.9	1.3%
Kansas City, MO-KS	39.4	1.3%
Chicago-Naperville-Joliet, IL-IN-WI	38.9	1.2%
Toledo, OH	38.5	1.2%
Nashville, TN	38.3	1.2%
<b>Largest 100 Metropolitan Areas</b>	<b>1,452.8</b>	<b>46.1%</b>
<b>United States</b>	<b>3,151.0</b>	

Source: Brookings analysis of data from BEA, BLS, IRS, Moody's Analytics, NAFSA, and USITC

**Table 3. Largest 10 Metropolitan Exporters of Basic Chemicals and Pharmaceuticals to Brazil, 2010**

<b>Metropolitan Area</b>	<b>Basic Chemicals and Pharmaceuticals Exports to Brazil, 2010 (mil \$)</b>	<b>Share of U.S. Basic Chemicals and Pharmaceuticals Exports to Brazil</b>
New York-Newark, NY-NJ-PA	382.1	8.8%
Houston, TX	373.8	8.7%
Indianapolis, IN	182.1	4.2%
Chicago-Naperville-Joliet, IL-IN-WI	150.8	3.5%
Philadelphia, PA-NJ-DE-MD	134.2	3.1%
Los Angeles-Long Beach-Santa Ana, CA	127.3	2.9%
San Francisco-Oakland-Fremont, CA	109.8	2.5%
Baton Rouge, LA	106.6	2.5%
Dallas-Fort Worth-Arlington, TX	93.0	2.2%
Cincinnati, OH-KY-IN	56.9	1.3%
<b>Largest 100 Metropolitan Areas</b>	<b>2,864.7</b>	<b>66.3%</b>
<b>United States</b>	<b>4,319.0</b>	

Source: Brookings analysis of data from BEA, BLS, IRS, Moody's Analytics, NAFSA, and USITC

Turning to exports of basic chemicals and pharmaceuticals to Brazil, three out of the largest 10 metropolitan area export hubs lay in the South (See Table 3). New York, which specializes more in pharmaceuticals, led this Brazil trade. Houston came in a close second. Some smaller metros, such as Baton Rouge, also rank among the largest exporters of basic chemicals and pharmaceuticals to Brazil, given their large production of basic chemicals.

The largest 10 metro exporters of nonferrous metal products to India are mainly from the West and Midwest (See Table 4). Salt Lake City led the rankings of U.S. exports of these products to India in 2010. The Northeastern large metros, Providence, and Pittsburgh also rank among the largest exporters of nonferrous metal products to India.

**Table 4. Largest 10 Metropolitan Exporters of Nonferrous Metal Products to India, 2010**

Metropolitan Area	Nonferrous Metal Products	Share of U.S. Nonferrous Metal Products
	Exports to India, 2010 (mil \$)	Exports to India, 2010
Salt Lake City, UT	38.7	3.0%
Chicago-Naperville-Joliet, IL-IN-WI	33.5	2.6%
Pittsburgh, PA	33.1	2.6%
Los Angeles-Long Beach-Santa Ana, CA	28.4	2.2%
Youngstown, OH-PA	26.9	2.1%
Dallas-Fort Worth-Arlington, TX	22.8	1.8%
St. Louis, MO-IL	21.8	1.7%
Ogden, UT	20.6	1.6%
Providence, RI-MA	20.6	1.6%
Phoenix-Mesa-Scottsdale, AZ	18.5	1.4%
<b>Largest 100 metropolitan areas</b>	<b>584.9</b>	<b>45.3%</b>
<b>United States</b>	<b>1,292.0</b>	

Source: Brookings analysis of data from BEA, BLS, IRS, Moody's Analytics, NAFSA, and USITC

#### 4. Manufacturing drove the export resurgence in 2010.

Manufacturing comprised the majority of U.S. exports in 2010. While on a declining trend as a share of U.S. exports, manufacturing has seen a comeback in the first year of recovery. About 61 percent of U.S. exports, manufacturing industries produced three-quarters of the additional U.S. sales abroad between 2009 and 2010. The sector's sales abroad increased by 14.5 percent and expanded faster than U.S. exports overall. Machinery, transportation equipment, and chemicals delivered one-half of manufacturing exports growth (See Table 5).

Machinery was the star in 2010. While only the third-largest U.S. manufacturing export, machinery contributed the most to U.S. export growth, and was the only large U.S. exporting industry

**Table 5. Top 10 U.S. Manufacturing Exports in 2010 and Their Recent Growth Rates**

Rank among Manufacturing Industries, 2010	Manufacturing Industry	Exports, 2010 ( bns \$)	Share of U.S.	Share of U.S.	Real Growth Rate of Exports 2009-2010
			Manufacturing Exports, 2010	Manufacturing Exports Growth 2009-2010	
1	Transportation Equipment	175.8	18.5%	17.0%	13.2%
2	Chemicals	171.2	18.0%	16.4%	13.1%
3	Machinery	124.6	13.1%	17.5%	20.4%
4	Computer and Electronic Products	121.4	12.8%	13.0%	14.8%
5	Petroleum and Coal Products	60.8	6.4%	5.4%	12.0%
6	Food	50.9	5.4%	4.5%	12.0%
7	Primary Metal	49.6	5.2%	5.1%	14.2%
8	Medical Equipment, Sporting Goods, and Misc.	39.4	4.1%	2.9%	9.6%
9	Fabricated Metal Products	32.6	3.4%	3.9%	16.8%
10	Electrical Equipment	32.2	3.4%	3.4%	14.7%
<b>Total U.S. Manufacturing Exports</b>		<b>950.9</b>	<b>100.0%</b>	<b>100.0%</b>	<b>14.5%</b>

Notes: The ranks are for 21 manufacturing industries, at three-digit North American Industry Classification System (NAICS) aggregation.

Sources: Brookings analysis of data from USITC and BLS

that achieved a growth rate above 20 percent between 2009 and 2010. This performance owed to increased capital investment worldwide after the recession. The other manufacturing exports with growth rates above 20 percent were smaller industries, such as leather products and wood products.

Manufacturing contributed disproportionately to export recovery in the large metros. While manufacturing accounted for 59 percent of the exports sold by industries located in the large metros in 2010, it delivered almost 76 percent of the exports growth in these metros. Midwestern metros illustrated this trend, with 85 percent of their exports growth generated by manufacturing industries.

Manufacturing industries delivered the majority of export sales growth in 94 out of the largest 100 metros in 2010. In places such as Milwaukee and Youngstown, OH, manufacturing contributed more than 90 percent of the metro export sales growth in the first year of recovery (See Table 6). In most large metros, at least two industries generated the bulk of additional manufacturing sales abroad in 2010. However, in 20 large metro areas, a single industry was responsible for the growth of manufacturing export sales. For example, in Greenville, SC, where manufacturing delivered 91 percent of metro export growth, machinery contributed one-half of the manufacturing growth.

Eleven out the largest 100 metropolitan areas nationally achieved 2009-2010 export growth rates sufficient for doubling exports in five years. Exports need to grow at a 14.87 percent annualized growth rate to double in five years, an exceptionally high rate when real growth rates are considered. While 11 out of 100 metro areas might seem like a small figure, this is more than double the number of metro areas that achieved this growth rate between 2003 and 2008. Manufacturing generated most of export sales growth in each of the 11 metros.

More specifically, sales abroad of transportation equipment fueled this high growth rate of export sales in seven out of the 11 metro areas. Midwestern metros such as Youngstown, Toledo, OH and Grand Rapids, MI thrived on exports of motor vehicles and parts. In the South, Chattanooga and San Antonio followed the same pattern, with sales of motor vehicles and parts contributing the largest share to their export sales growth between 2009 and 2010. Sales abroad of aircraft and aircraft parts helped Tucson, AZ and Charleston, SC post 2010 exports growth rates above 14.87 percent.

**Table 6. Manufacturing Contribution to Export Growth, Largest 100 Metro Areas, 2009-2010**

Rank, Manufacturing Contribution to Export Growth	Manufacturing Area	Manufacturing Contribution to Metro Export Growth 2009-2010	Industry with Largest Contribution to Metro Export Change	Percentage of Metro Export Growth
1	Milwaukee-Waukesha-West Allis, WI	93.3%	Machinery	32.8%
2	Youngstown-Warren-Boardman, OH-PA	92.5%	Transportation Equipment	40.4%
3	Toledo, OH	91.6%	Transportation Equipment	43.0%
4	Greenville-Mauldin-Easley, SC	91.5%	Machinery	45.8%
5	Grand Rapids-Wyoming, MI	90.2%	Transportation Equipment	28.3%
6	Louisville-Jefferson County, KY-IN	89.5%	Machinery	15.4%
7	Columbia, SC	89.0%	Transportation Equipment	24.0%
8	Ogden-Clearfield, UT	88.8%	Primary Metal	25.5%
9	Cleveland-Elyria-Mentor, OH	88.7%	Chemicals	18.5%
10	Charleston-North Charleston-Summerville, SC	88.6%	Transportation Equipment	54.0%
<b>Largest 100 Metropolitan Areas</b>		<b>75.9%</b>	<b>Chemicals</b>	<b>13.4%</b>
<b>United States</b>		<b>75.0%</b>	<b>Machinery</b>	<b>13.2%</b>

Source: Brookings analysis of data from BEA, BLS, IRS, Moody's Analytics, NAFSA, and USITC

## 5. High-value-added service exports witnessed uninterrupted growth throughout the recession and recovery.

Services exports growth was another welcome feature of the 2009–2010 recovery. In 2010, the United States was the largest world exporter of commercial (or private) services.<sup>24</sup> U.S. exports of private services represented 14 percent of world exports of services, more than double the share of the second ranking country service exporter—Germany. In addition, the United States increased its share of world service exports from 2008 to 2009, reflecting the relatively higher demand for U.S. services during the recession.<sup>25</sup>

Commercial service exports exhibited less volatility than manufacturing exports during the recession and recovery. While U.S. manufacturing exports dropped by more than 17 percent in 2009, service exports declined by less than 4 percent. At the same time, service exports increased by almost 6 percent in 2010, a fraction of the double digits manufacturing exports growth. Private services exports represented a third of U.S. exports in 2010.

High-value-added services exports such as education, telecommunications services, and business services grew both in 2009 and 2010. This group of services represented 30 percent of U.S. private service exports in 2010. In the middle of the recession, when U.S. exports plummeted in double digits, expenditures of foreign students in the United States grew by 12 percent. Business services exports (such as architecture and industrial engineering services sold to foreign residents) grew by 2 percent in the recession, and witnessed accelerated growth in 2010.

The large metropolitan areas produced three-quarters of U.S. service exports in 2010. The share was slightly lower (73 percent) in the case of expenditures of foreign students, while the large metros produced 81 percent of telecommunications services exports (receipts from abroad for services such as private leased channel services, online access services, and Internet backbone services). Entities located in the large metro areas generated more than 75 percent of U.S. business services exports, such as work done abroad by an architecture firm located in the United States.

Thanks to data provided by NAFSA: The Association of International Educators, this edition of “Export Nation” estimates metro education exports based on the expenditures of foreign students at higher education institutions located in a metro area. These export estimates reflect the actual geographical distribution of the spending of foreign students around the country, an improvement introduced in this edition.

**Table 7. Education Exports, Largest 100 Metro Areas, 2010**

Rank, Education Exports' Share of Metro Exports	Metro Area	Education Exports' Share of Metro Exports	Education Exports Real Growth Rate, 2009–2010
1	Boston-Cambridge, MA-NH	4.8%	7.0%
2	Madison, WI	4.4%	9.6%
3	Springfield, MA	4.1%	8.8%
4	Honolulu, HI	3.9%	-6.3%
5	Syracuse, NY	3.9%	13.5%
6	Washington-Arlington-Alexandria, DC-VA-MD-WV	3.5%	-7.9%
7	Providence, RI-MA	3.1%	13.1%
8	New Haven, CT	3.0%	10.1%
9	Provo, UT	2.9%	-14.2%
10	Columbus, OH	2.7%	29.6%
<b>Largest 100 Metropolitan Areas</b>		<b>1.5%</b>	<b>3.4%</b>
<b>United States</b>		<b>1.4%</b>	<b>4.4%</b>

Source: Brookings analysis of data from BEA, BLS, IRS, Moody's Analytics, NAFSA, and USITC

Northeastern large metros dominated the education exports landscape. In 2010, large metropolitan areas in the Northeast secured 35 percent of the expenditures of foreign students in the large metro areas in the country. These expenditures reflect not only tuition fees at universities, but also the accommodation and living expenses of foreign students studying in the United States. New York, Boston, and Philadelphia ranked among the top 10 metro education exporters in 2010.

Northeastern large metros were also more reliant on education exports for their export performance. In 2010, five out of the top 10 large metros, based on the share of education out of metro exports, were located in Northeast (See Table 7). Yet this is not a story only about the largest metros. Syracuse and Springfield, MA were among the metros that rely on the expenditures of foreign students for their exports more than the nation overall.

## Policy Implications

**I**n small and large metropolitan areas, exports increased rapidly in the first year of the nation's economic recovery, adding much-needed jobs in the process. By setting the goal of doubling exports by the end of 2014, President Obama's National Export Initiative (NEI) recognized the power of exports in expanding the U.S. economy. Now, having witnessed encouraging progress, the federal government—together with the states and metropolitan areas—needs to do more to sustain the high growth rate of U.S. exports.

Already, the NEI has made progress in the first year of implementation. From the passage of free trade agreements (FTAs) with Korea, Colombia, and Panama to the introduction of the State Trade and Export Promotion Program (STEP) aimed at bolstering state export promotion activities, the NEI scored real achievements in 2011. The planned consolidation of several federal agencies and departments involved in trade would further solidify this progress.

And yet, the success of the NEI depends on the nation's true hubs of export growth—U.S. metropolitan areas. As evidenced in this report, metropolitan areas delivered the majority of export growth in the first year of recovery. That means that while federal action will be essential for maintaining a competitive dollar, open foreign markets, and a global level playing field, much critical U.S. exporting activity will take place among the thousands of small- and medium-sized businesses that operate on a local scale in the nation's large and small metropolitan areas.

The NEI should leverage the unique role and assets of the four newly created pilot Metropolitan Export Initiatives (MEIs), advanced in partnership between the Brookings Metropolitan Policy Program and four regions, to best achieve national export goals. The MEIs provide a platform for proactive, customized, targeted outreach and prioritized approaches at a time when the United States needs high return on limited resources.

The four pilot MEIs are an invaluable policy experiment in creating a “bottom-up” policy framework on exports and in better connecting federal efforts with the reality on the ground. As such, the initiatives are serving as a valuable source of learning about what works and what is needed to catalyze accelerated export-based growth in U.S. metropolitan areas. And so, based on the experience of the MEI pilots, three lines of action emerge. First and foremost, the federal government needs to set up a platform for export growth through export-friendly trade and macroeconomic policies, more export financing, increased support for the U.S. infrastructure system, and better export data. Second, the federal government has to align with the metropolitan export strategies through the creation of a unified federalist export team, bolstered support to burgeoning MEIs, and a stronger embrace of cluster-oriented economic development policies. And finally, metropolitan leaders need to establish stronger linkages with the trading partners of their exporters. Adoption of this new type of federalism-focused on metropolitan areas, collaboration, and economic competitiveness—is going to be critical if the nation is to achieve the national export goal.

Subsequently, “Exports 2012” points to three areas of federal and “federalist” collaboration in support of continued export growth in America.

## A. Create a National Platform for Export Growth

### **Level the Playing Field**

The federal government has the sole prerogative of conducting international trade policy and macroeconomic balancing. These are complex tasks, especially in that they often involve the cooperation and coordination with other nations. Over the last few years, the federal government moved vigorously on several fronts, from completing free trade agreements and fighting counterfeiting to reorganizing the export control system.

To better support U.S. exporters, the federal government should

- Conclude the Trans-Pacific Partnership (TPP) Agreement in 2012
- Repeal the Jackson-Vanik amendment that restricts trade with Russia, the last G-20 member to join the World Trade Organization (WTO) in December 2011
- Do more to protect the intellectual property (IP) rights of American businesses around the world, and especially in China. According to the United States International Trade Commission (USITC), the overall IP infringement in China costs the U.S. economy as much as \$107 billion and 2.1 million jobs<sup>26</sup>
- Accelerate the implementation of the Export Control Reform Initiative. Especially in these times of consolidation of the military in the United States, it is imperative for U.S. companies that contracted with the military to be able to develop quickly their products for civilian purposes and sell them abroad
- Implement a multilateral trade liberalization agenda that goes beyond the difficulties around the Doha round, by building a “coalition of the willing” to make faster progress on dismantling trade barriers around the world

### **Export Promotion and Financing**

Federal export services play a major role in diminishing the cost and uncertainty around exporting for small- and medium-sized businesses (SMEs). As the organizations involved in the four pilot MEIs found out, the main reason why local SMEs do not export is fear of the unknown, in the form of regulations, currency risks, taxes, language, and cultural differences. Services provided in the United States by federal U.S. Export Assistance Centers and abroad by the Foreign Commercial Service (both part of the International Trade Administration) help U.S. companies gain information, meet clients, market their products, and create an export plan.

In 2010 and 2011, the Trade Promotion Coordination Committee (TPCC) agencies increased and expanded the number of trade missions, especially those led by senior officials to key markets, improved the marketing of trade shows to U.S. companies, and recruited more potential foreign buyers. In terms of export financing, both the U.S. Export-Import Bank (Ex-Im Bank) and the Small Business Administration (SBA) increased the amount of credit available to U.S. companies. Ex-Im launched a supply chain finance guarantee product to provide liquidity to domestic suppliers of U.S. exporters, while SBA increased the credit limit on the Export Express program to \$500,000, and for the Export Working Capital Program (EWCP) and International Trade Loan (ITL) programs to \$5 million.

Moving forward, the TPCC agencies, especially those engaged in providing services directly to U.S. exporters, should consider the following changes:

- Increase their flexibility in allocating resources in places with high demand at home and abroad. While the NEI identified as targets for U.S. export promotion the high-growth markets of Brazil, China, and India, and next-tier emerging markets of Colombia, Indonesia, Saudi Arabia, South Africa, Turkey, and Vietnam, only a third of the Commercial Service's (CS) overseas staff is in NEI priority countries<sup>27</sup>
- Re-evaluate and enhance the CS programs and counseling. According to the surveys and interviews collected by the Los Angeles MEI team, the training of domestic and foreign commercial officers needs to be enhanced with technical training on fundamental export strategies and practical counseling on how to export
- Urge Congress to adequately fund and support exporting SMEs. Small- and medium-sized enterprises need individual case management, which is time consuming and requires a seamless system of information across agencies and departments, inside and outside the United States. With

all the efforts at the state and metro level, federal export services are often not substitutable on the ground

- Better market their services to U.S. companies. While the federal government provides a myriad of services, products, and activities in support of exporters, there is little awareness of them among SMEs
- Commit to a visible, coordinated, and highly-professional presence at global trade fairs, which would help U.S. companies find clients in foreign markets. One of the common themes emerging from the surveys conducted as part of the four pilot MEIs was the lack of engagement and presence of the U.S. government at global trade fairs, in comparison with other countries such as Japan, Germany, or South Korea

### ***Connecting U.S. Products to Global Markets***

A well functioning transportation system is essential for an export-driven economy. The transportation system touches all U.S. exports in one way or another, such as the shipment of U.S. merchandise abroad, the consignment of supplies across the country, or the fly-in of foreign visitors and business clients. The TPCC agencies are at the beginning of creating a unified framework for tackling transportation issues, as part of the national drive for exports. In 2011, the departments of Commerce and Transportation entered into a memorandum of understanding (MOU) to collaborate with stakeholders to improve the infrastructure system in support of exports.

In 2012, Congress and the administration should

- Provide more and steady funding for the federal transportation system. The federal surface transportation program needs a long term authorization statute, which would allow necessary investments in the maintenance and development of the U.S. infrastructure system. Only in February 2012 was the Federal Aviation Administration (FAA) authorization approved following 23 extensions since the previous statute expired in 2007
- Create a national freight strategy that pays particular attention to freight corridors, urban freight, and last mile sections. This framework could learn from the Federal Highway Administration (FHWA) Freight Performance Measures Initiative and from Germany's Freight Transport and Logistics Masterplan<sup>28</sup>
- Something similar to the "MAP-21" bill should be considered and would be critical for goods movement infrastructure projects.
- Make available tax incentives for companies that commit to export activities on designated Superfund sites. For example, a substantial portion of the land adjacent to Portland's port facilities is locked up in federal Superfund designations

### ***More and Better Export Data at the Metro Level***

Data are essential to set up goals of any strategy and measure progress. The federal government provides a plethora of U.S. export data through TradeStats Express, USA Trade Online, the Exporter Database, and the U.S. Bureau of Analysis International Economic Accounts. The problem is that federally-collected export data at the metropolitan level are rare or almost nonexistent. Further, if they are available, they are old, reflect only shipments of goods, do not provide detailed industry, commodity or export market information for all the metropolitan areas, and do not link the exporter information with the value of their exports.

To better serve the NEI on the ground, the federal government should consider the following actions:

- Collect, improve, and release metropolitan export series of goods and services. For accurate export planning, as part of a regional economic plan, metros need to know, among others, the value of the goods and services produced in their area that are sold to foreign residents; what commodities and services are sold; what type of firms and organizations sell them (e.g. the size, industry affiliation); and to what country markets they sell, in a timely fashion. Without this information, it is difficult to incorporate international exports in regional economic development and see the benefits of U.S. exports at the local level
- Repeal statutory limitations that prohibit the U.S. Census Bureau, the U.S. Bureau of Analysis (BEA), and the U.S. Bureau of Labor Statistics (BLS) from sharing with each other their lists of

companies, which would allow BEA to better identify exporters of services. BEA estimates that between \$20 billion and \$40 billion of services exports are overlooked because of the inability to identify gaps in the BEA, U.S. Census Bureau, and BLS business lists<sup>29</sup>

- Make available the progress metrics across federal agencies regarding NEI at the metro and state level. In this way, the MEIs and states could coordinate their performance metrics with the federal government
- Integrate the federal progress metrics on the ground to reflect the cooperative system of export providers, so that they are not merely a checklist of activities that come from federal agencies' headquarters. For example, the LA MEI recommended a set of performance metrics that would track the extent to which companies move through the system of export services providers, the success likelihood in making sales, the volume of export sales, and the metro exports growth
- Appropriate more funding to the federal agencies in charge of export data. Given limited resources, the U.S. Census Bureau publicly releases exports estimates at the national and state level, while providing metropolitan estimates to the International Trade Administration, based on a separate contract

## B. Align the NEI with the MEIs

Metropolitan areas are the export engines of states and of the nation as a whole. In 2011, based on a policy idea introduced by the first edition of "Export Nation," the Metropolitan Policy Program at Brookings developed the Metropolitan Export Initiative (MEI), which is a ground-up collaborative effort to help regional civic, business, and political leaders create and implement customized Metropolitan Export Plans. These plans integrate market intelligence, export-related services, and policy reforms to help regions better connect their firms to global customers, thereby helping metro areas fulfill the nation's export ambitions. Four metro areas (Los Angeles, Minneapolis-Saint Paul, Portland (OR), and Syracuse) already embarked on creating their own MEIs and more will follow after the U.S. Conference of Mayors' metro export challenge.

To leverage the power of this "bottom-up" ferment, the federal government should undertake the following actions aimed at making sure the NEI supports and enhances on-the-ground export promotion:

- The federal government should work in coordination with the states and metros to embed the NEI in the export efforts at the metro and state level. Where possible, the feds should prioritize existing grant programs in ways that reward states that work strategically with their metros or provide metros with direct resources to plan/implement export strategies
- To ensure the quality of U.S. products sold abroad, the federal government should increase investment in R&D, sustain regional innovation cluster initiatives, and support the metro areas in their effort to develop human capital through education, training, and immigration

## **Integrated Federalist Export Team**

To better coordinate their representatives across the country with the MEIs and state export activities, the TPCC agencies should consider the following changes:

- Integrate their activities on the ground. President's Obama proposal to consolidate six agencies involved in trade (U.S. Department of Commerce's core business and trade functions, the SBA, the Office of the U.S. Trade Representative, the Ex-Im Bank, the Overseas Private Investment Corporation, and the U.S. Trade and Development Agency) should not be limited only to the consolidation of the D.C. headquarters of these agencies
- Coordinate with MEIs and the state programs. The local representatives of the federal export agencies such as the U.S. Export Assistance Centers and the Small Business Development Centers should operate as a unified team with the state export programs and the MEI organizations, with shared export objectives, performance metrics, and a clear system of referring clients and sharing information
- Include in the performance measurement of their local workforce criteria that take into account the local coordination aspects
- Create a mechanism that allows the sharing of information on export outcomes with all the members of the metro export team

- Provide grants to the MEIs and the states that work with their metros in implementing an export strategy. Future rounds of federal funding, for example the State Trade Export Promotion (STEP) grants, should reward state applicants that leverage and support local export initiatives such as the MEIs

Federal government can play a major role in the integration of international exports in regional economic development. For example, the Department of Commerce (DOC) could use Economic Development Administration (EDA) grants to target metropolitan areas that not only have a Comprehensive Economic Development Strategy (CEDS), but also an articulated Metropolitan Export Plan. Another DOC agency, the International Trade Agency (ITA), could prioritize Market Development Cooperator Program (MDCP) grants for metro organizations that are in charge of delivering a Metropolitan Export Plan.

### ***Improving U.S. Made Products for Export***

U.S. exporters are at the forefront of U.S. competition in the global market. The mere fact that they can sell their goods and services around the world shows that they can compete with firms from other countries. Regional innovation clusters contain the underlying drivers of U.S. competitiveness, given they are geographic concentrations of interconnected businesses, suppliers, service providers, coordinating intermediaries, and associated institutions like universities or community colleges in a particular field.<sup>30</sup> The federal government could help exporters and their regional clusters by

- Providing more federal funding for basic research and an extended R&D tax credit for companies
- Supporting initiatives such as the Advanced Manufacturing Partnership that help accelerate the deployment of new technologies
- Increasing the quality and quantity of human capital available to U.S. exporters. This is not only a matter of more higher education, but an education that is more aligned with the needs of employers
- Supporting Science, Technology, Engineering, and Mathematics (STEM) education and technical workforce training, along the lines set up by the America Competes Reauthorization Act of 2010. Given that manufacturing represents two-thirds of U.S. exports, many U.S. exporters are looking for individuals with technical training or science, technology, engineering, and mathematics education<sup>31</sup>
- Resolving the issue of immigration at the high end of the skill continuum, which would allow U.S. exporters to fill gaps in their workforce needs. This is a small, but important issue for exporters, which need to remain flexible and competitive in the global markets

### **C. Metros Should Establish Stronger Linkages with Trading Partners**

Finally, metropolitan leaders need to take matters into their own hands and forge stronger direct links to their regions' trading partners.

In this respect, the Great Recession accelerated the shift away from the traditional economic powerhouses in the West towards metropolitan areas in the South and East, especially when it comes to economic growth.<sup>32</sup> The rapid changes in U.S. export destinations in the first year of recovery confirm these global shifts. Now more than ever, then, U.S. metro leaders need to understand where the demand for their metro products resides and to what particular countries/metros their businesses export.

Most U.S. metro leaders are just starting to learn about the importance of international exports to the well-being of their economies. Only a few metro areas, such as San Francisco and Seattle, have an outward-looking business culture and strong organizations to support their exporters. Metro leaders should consider the following items, in light of the shifts in the global economy:

- Better understand the trade relations of the companies located in your area. With the help of local universities and business organizations, metros can identify where the foreign clients of their businesses are located. This would help better target foreign markets, in case of the development of a metropolitan export plan. One way to tackle this early stage is to apply lessons from the experience with foreign investment attraction
- Consider also service exports market destinations. For example, in metros anchored by

universities, it is important to identify the country/city of origin of foreign students. The same principle applies to international visitors, whose expenditures support industries from accommodation and transportation to manufacturing of apparel and personal consumption items

- Market under one regional brand when going on trade and investment missions. For example, companies and municipalities from the Stuttgart region market under a single banner at EXPO REAL, an annual international trade fair for commercial property and investment held in Munich<sup>33</sup>
- Maintain an active relationship once a trade partner is identified. San Francisco and the Bay Area metro areas in general focus on China as a priority trading and investment partner. The Bay Area Council, representing the metro areas in that region, opened the first metro office in Shanghai in 2010. A number of organizations in the San Francisco metro area, including the city of San Francisco and the San Francisco Chamber of Commerce, launched ChinaSF, an initiative focused on maintaining a robust trade and investment relationship with Chinese companies
- Learn from the experience of other metro areas. With the development of the pilot MEIs and the export challenge of the U.S. Conference of Mayors, there will be an increasingly larger number of metro leaders knowledgeable in the do's and don'ts of expanding the global exposure of their local economies

In sum, metropolitan areas in the United States will increasingly depend on sales abroad for their economic prosperity. The global economy is already a metro-driven network, across state and national borders. Metros better integrated into this global network, especially those related to metros which are fast growing and rapidly increasing their consumption, are better positioned to endure these turbulent economic times. And in so doing, they will help renew the American economy.

## Conclusion

**I**n a slow recovery, exports are essential to job creation and the reorientation of the U.S. economy towards productive economic growth. Metropolitan areas are a vital part of this proposition.

In 2010, exports were a major driver of the U.S. recovery and the largest metropolitan areas produced the majority of the nation's exports. While the overall economy was still losing jobs, the rapid growth of U.S. export sales translated into 600,000 additional jobs in the first year of recovery. These are jobs not only in the industries producing the exported goods and services, but also in the suppliers to the exporting industries, and in the case of merchandise exports, in the transportation and wholesale trade industries. Manufacturing drove the rapid recovery of U.S. export sales, while some high-value-added service exports grew throughout the recession and recovery. In line with the rapid changes in the world economy, U.S. exporters increasingly targeted emerging markets as export destinations in 2010.

President Obama launched the NEI two years ago, but the initiative represents just one element of a needed federalist export strategy. While the federal government has to set up a national platform for export growth, the NEI should leverage the unique role and assets of regional export plans (MEIs). And finally, metropolitan leaders need to identify and establish stronger links with the trading partners of their exporters. Only a federalist and public-private partnership enterprise can truly help U.S. companies export more and in the process, create jobs in the United States.

## APPENDIX A. Additional Methodological Information

### Geographic Definitions

This second edition of "Export Nation" estimates exports of goods and services for each of the 3113 counties in the 50 states plus the District of Columbia, which allows the simultaneous calculation of exports at the metropolitan level, at the state level, and for the metropolitan portions in each state in the case of metro areas that cross state borders. This report uses the U.S. Bureau of Analysis definition of a county, which in comparison with the U.S. Census Bureau definition, includes the estimates for Kalawao County, HI, and the small independent cities of Virginia—generally those with fewer than 100,000 residents—in their adjacent counties.<sup>34</sup>

This study assesses export trends across the top 100 metropolitan areas in 2010, using metropolitan statistical areas (MSAs) as defined by the Office of Management and Budget (OMB) in 2009.<sup>35</sup> There were 366 metropolitan areas in 2009 and this report focuses on the largest 100 metro areas, with at least 500,000 residents in 2009. This report concentrates on this group, because they collectively contain two-thirds of the nation's jobs and generate three-quarters of GDP.<sup>36</sup>

### Export Categories

This edition presents the industry analysis of exports for 34 major export categories (See Table A1). For size comparability reasons, it uses 26 categories for goods (three-digit NAICS aggregation) and eight for services (U.S. Bureau of Analysis-BEA export service categories). This study does not use the exports values by industry from the U.S. input-output tables, because it needs to calculate metro exports by category to export markets. BEA releases service exports by destination market only by its own service categories.

In the case of goods exports, it employs a three-digit North American Industry Classification System (NAICS) industry aggregation, instead of commodity, because the estimation method is based on allocating U.S. exports by the geographical distribution of production of the exporting industry. This study uses U.S. estimates of domestic goods exports by U.S. industries, provided by the U.S. International Trade Commission (USITC).<sup>37</sup> It does not include waste, used merchandise, goods returned to Canada, special classification provisions, scrap, and re-exports, because they are not firsthand production or not identifiable by industry.

For services, this report uses U.S. Bureau of Economic Analysis (BEA) private services estimates, which the federal agency compiles from a number of surveys targeted at certain service industries.<sup>38</sup> In order to allocate services exports by production, this study constructs a match-up table between the BEA services export categories to NAICS codes.<sup>39</sup> It does not include U.S. government miscellaneous services, transfers under U.S. military agency sales contracts and "other services" category from private services (which is mainly expenditures by foreign governments and international organizations in the United States), because they are not commercial services.

The second edition of "Export Nation" reduces the number of main export categories from 36 to 34, because of two reasons; this study creates a "travel and tourism" category out of travel and passenger fares from foreign residents, as the U.S. Travel Association does.<sup>40</sup> Further, due to the BEA inclusion of the distribution rights for film and television recordings from "other services" to royalties and license fees, "film" is not a separate export category in this edition. The rest of "other services" were not included in the analysis, being mainly expenditures of foreign embassies in the United States. BEA made additional methodological changes to the export service estimates in 2011 and revised the historical estimates up to 1999. These changes include

- Reclassification of cruise fares from passenger fares to travel
- Reclassification of postal services from U.S. government miscellaneous services to "other" transportation
- Exclusion of expenditures of foreign nationals working at international organizations in the United States from "other" private services

The U.S. exports in this report are a sum of USITC goods domestic exports and BEA private services exports, without waste, scrap, and re-exports, U.S. government miscellaneous services, transfers under U.S. military agency sales contracts, and expenditures by foreign governments and international organizations in the United States.<sup>41</sup> This subset of U.S. exports was 85 percent of the total U.S. exports (on a balance-of-payments basis) in 2010, reported by BEA.

**Table A1. The 34 Major Export Categories of Goods and Services Analyzed  
in the Second Edition of “Export Nation”**

GOODS EXPORTS	Export Category Name	Exporting Industry NAICS
	Oil and Gas Extraction	211
	Mining	212
	Food	311
	Beverage and Tobacco Products	312
	Textile Mills	313
	Textile Product Mills	314
	Apparel	315
	Leather and Allied Products	316
	Wood Products	321
	Paper	322
	Printing and Related Support Activities	323
	Petroleum and Coal Products	324
	Chemicals	325
	Plastics and Rubber Products	326
	Nonmetallic Mineral Products	327
	Primary Metal	331
	Fabricated Metal Products	332
	Machinery	333
	Computer and Electronic Products	334
	Electrical Equipment	335
	Transportation Equipment	336
	Furniture and Related Products	337
	Medical Equipment, Sporting Goods, and Misc.	339
	Publishing	511
	Agriculture	111 and 112
	Forestry and Fishing	113 and 114
SERVICE EXPORTS	Export Category Name	BEA Service Export Category
	Travel and Tourism	Sum of travel and passenger fares
	Education	Education
	Royalties	Royalties
	Financial Services	Financial Services
	Freight and Port Services	Other transportation
	Insurance Services	Insurance Services
	Telecommunications	Telecommunications Services
	Business Services	Business, Professional, and Technical Services

### Detailed Export Estimates

While focusing on the 34 main export categories, the second edition of “Export Nation” increases the industrial detail for a better understanding of the evolution of the leading export industries. It estimates 212 sub-components of the major export categories, which are four-digit NAICS for the goods exports; travel and tourism industries as detailed by BEA in the “Travel and Tourism Account”; detailed business, professional, and technical services as detailed by BEA in International Service Statistics; and industries receiving royalties receipts, as shown by IRS in returns of active corporations. The detailed export categories at subnational level were estimated with the same allocation method as the major categories and adjusted to tie out with their major categories at the metropolitan level.

BEA export data is unavailable for the industries composing "Other Business, Professional, and Technical Services" during the years 2003, 2004, and 2005. Available data on each industry's unaffiliated exports (transfers between companies without stakes in one another) and their aggregate "Other Business, Professional, and Technical Services" exports make the limited application of time series extrapolation possible. This is so because: 1) unaffiliated exports provide a lower bound with which to couch a forecast and serve as a trend predictor because they are highly correlated with overall exports, 2) the availability of the aggregated value of "Other Business, Professional, and Technical Services" provides an upper bound for the estimation of its subcomponents. To reduce error, this study sets the autoregressive integrated moving average (ARIMA) specifications according to the models that best follow the industry share trends during the known years. Total gross output served as the predictor of mining service exports due to the lack of unaffiliated export data during the missing years.

### **Time Periods and Real Growth Rates**

This study estimates exports at county level (and through aggregation, at metro and state level) between 2003 and 2010. Any growth rates of the export sales are in real terms, with the previous years adjusted for inflation to 2010. The exports are inflation-adjusted by export category. To adjust for inflation to 2010 dollars, the analysis uses the BLS Producer Price Indexes (PPI) for each of the major goods export categories (three-digit NAICS industries) and for their subcomponents (four-digit NAICS industries). This study uses the BLS (PPI) for goods exports, due to insufficient industry detail and time series availability for the BLS export prices indexes. The BLS PPI indexes were available for all goods except agricultural production. For agriculture, this study uses the BEA exports price index for agricultural goods. For service exports, it employs the BEA service export price indexes by service export category. To approximate the pre-recession growth rates, this study calculates the annualized real export growth rate between 2003 and 2008.

### **Estimation Method for Metropolitan Exports**

The purpose of this study is to examine the U.S. exports produced in the top 100 metropolitan areas. While the U.S. Census Bureau has been compiling metropolitan goods exports since 1995, these data do not accurately reflect the origin of production. They are allocated based on origin of movement declared by the exporter, which is not always the place where the good was produced. In addition, if the exported goods are consolidated, the metro export series assigns them to the metro area where the consolidation point is located. Last but not least, the Census-ITA metro exports data are limited only to merchandise trade, not including services flows.

This study allocates U.S. exports associated with an individual industry in proportion to each county's Gross Value-Added (GVA) share generated by the same industry in the United States. This approach assumes that if Los Angeles county produces 5 percent of the national value-added of computer manufacturing, then this county also exports 5 percent of U.S. computer and electronics. In the case of trading partners, this method apportions the U.S. exports of an industry sold to a particular country to each of the U.S. counties in proportion with the county share of output produced by that same industry to the national total. So, in the hypothetical Los Angeles county example, if the U.S. exported \$100 billion to China in computer and electronics in 2010, Los Angeles county would be credited with exporting \$5 billion (i.e. 5 percent) to China in computer and electronics in 2010. The data is aggregated afterwards at metropolitan level to obtain metropolitan exports series.

This methodology uses output instead of employment to allocate the national exports to the metro level, to reflect the value-added by the exported goods and services.<sup>42</sup> The difference is more at the conceptual level—there is a very high level of overlap between the export estimates based on employment and output.<sup>43</sup>

The method used here is similar to previous efforts to estimate sub-national export data based on location of production. Testa, Klier, and Zelenev from the Federal Reserve Bank of Chicago employed the same method, using metropolitan industry employment shares.<sup>44</sup> Brooks, with the U.S. Department of Agriculture, used the state level agricultural production data to allocate U.S. exports of agricultural goods to the states of production.<sup>45</sup> In addition, the Bureau of Economic Analysis (BEA) uses

an allocation method to estimate the Gross Metropolitan Product from the state output.<sup>46</sup> For more on the accuracy of this methods' estimates, please see the Appendix in the first edition of "Export Nation."

In an effort to better approximate metropolitan services exports, "Export Nation" employs a different allocation method for three service categories. Those three are royalties from intellectual property, travel and tourism, and education. This edition improves the accuracy of these three service export series.

For royalties, this study introduces an additional step in the allocation method. It first calculates industry royalties accrued from the use of U.S. copyrights, patents, and trademarks by foreigners by multiplying the U.S.' other" royalties export revenue by the share of the industry's royalties out of the total U.S. royalties. This edition improves on the industry royalties' distribution, by using the IRS industry receipts from royalties, based on all returns of all active companies, instead of only those with net income, as in the previous edition. Starting in 2011, BEA reports royalties separated by film and television recordings and "other" royalties. By applying the allocation method only to "other royalties," this method helps reflect the metro concentrations of movie production. In a second step, this study allocates industry's royalties exports to the county level in proportion to each county's GVA share generated by the same industry in the United States.<sup>47</sup>

A similar allocation method was used for the travel and tourism exports, by estimating first the export revenues that accrue to an industry that sells goods and services consumed by foreign tourists. Based on the industry composition of tourism from the BEA "Travel and Tourism Account," this study calculates U.S. travel exports by tourism industry, excluding the international passenger air tourism category. Once the travel exports by tourism industry are obtained, this study added the expenditures of foreign tourists on domestic airfare to the BEA category "passenger fares," to obtain a measure of the expenditures of foreign tourists on air transportation. Afterwards, the travel and tourism exports by industry were allocated to counties in proportion to each county's share of value-added in the same industry. This edition creates the combined category "travel and tourism" and improves on the NAICS identification of travel and tourism industries, based on a BEA provided correspondence table between Travel and Tourism Account industry category and NAICS.

Finally, in the case of education, this study uses the county share of the expenditures of foreign students out of the expenditures of foreign students in the United States to allocate education exports at the county level. Thanks to the data provided by NAFSA: The Association of International Educators, this edition improves on the methodology, by using the geographical distribution of expenditures of foreign students in the United States instead of the number of foreign students in the United States. This is the only export category studied in this report that reflects different degrees of export propensity at the local level, independent of the U.S. education export propensity.

This study estimates metropolitan exports to trading partners for the countries to which the United States sold more than \$1 billion worth of goods (excluding waste, scrap, used merchandise, goods returned to Canada, special classification provisions, and re-exports) in 2010. For some countries, metro exports reflect only goods exports, due to unavailable public information on U.S. service exports to their markets.

### **Estimation Method for Export-Supported Jobs**

This update employs a different technique in estimating jobs supported by exports than in the first edition. The previous "Export Nation" estimated export-related jobs, based on the share of exports in the Gross Value-Added (GVA) of an industry, multiplied by the employment instead in that industry. This method overestimated the number of jobs supported by exports, because it assumed the entire value of exports produced in the United States and supporting jobs. However, U.S. exports use foreign-value-added intermediate inputs, about 12.9 percent in 2004 according to the U.S. International Trade Commission (See Box: A Value-Added View of Trade). In addition, the previous method assumed that the transportation and wholesale trade portion of the value of goods exports support the same number of jobs as the production of goods exports.

This edition improves on the previous method by:

- Using annual job multipliers calculated by the U.S. Bureau of Labor Statistics (BLS), adjusted to remove the employment effect of imports

- Calculating separately the jobs supported by the production, transportation and wholesale trade involved in goods exports
- Estimating both the direct jobs supported by exports (jobs in the exporting industry) and the total job effect of exports, in the exporting industry, the supply chain, and in the case of goods exports, in the transportation and wholesale industries. This study does not estimate the impact of spending for consumer goods by those people earning the income generated by producing the exported goods and services

This edition estimates two sets of export jobs data:

1. Total export-supported jobs show the broader employment impact of exports, expressed as the number of jobs supported by exports in the industry producing the export, its suppliers of intermediate inputs, and in the case of goods exports, in the transportation and wholesale trade industries across the United States. For example, the sale abroad of a car produced in Detroit supports jobs not only in Detroit, but also in places where the suppliers to car production and the logistics firms handling the wholesale and transportation of the exported car locate. Metro total export-supported jobs are jobs in the metro area and around the United States
2. Direct export-production jobs are a subset of the total export-supported jobs, showing the jobs supported by exports in industries producing the exported good or service. Because this study estimates metropolitan exports by location of production, it assumes the direct export-production jobs to be located in the metropolitan area where the export is produced

In estimating these two jobs series, this study uses the annual job multipliers calculated by the U.S. Bureau of Labor Statistics (BLS), adjusted to remove the employment effect of imports.<sup>48</sup> For direct export-production jobs, it uses the BLS job multipliers that show the number of direct jobs, full-time or part-time, supported by \$1 million worth of sales (valued in production prices) of the products of an industry. For total export-supported jobs, it employs the BLS job multipliers that show the number of direct and indirect jobs, full-time or part-time, supported by \$1 million worth of sales (valued in production prices) of the products of an industry. For example, \$1 million worth of sales (in production prices) of industrial machinery supported an average of 3.23 direct jobs in the United States 2010—these are jobs in the industrial machinery industry itself. The same amount of industrial machinery production supports on average 7.02 direct and indirect jobs in the United States in 2010—these are jobs in the industrial machinery industry and in any U.S. industry that provided inputs into the production of those commodities.

In the case of merchandise exports, this study calculates separately the jobs supported by the production, transportation, and wholesale trade involved in goods exports, because the BLS job multipliers do not reflect the employment effect of transportation costs and handling charges to transport commodities to final consumers. The production, transportation, and wholesale trade shares of goods exports are calculated based on the U.S. Bureau of Economic Analysis (BEA) 2002 detailed input-output table “Use of commodities by industries,” the latest available detailed table.<sup>49</sup>

For some of the export categories, there were not job multipliers available from BLS. The creation of job multipliers requires the underlying U.S. input-output MAKE and USE tables aggregated at the level of the export category, as well as the employment and output values and final demand, also at the same level, and a recalculated total requirements table. Then using the same aggregation level employment-to-output ratio, the industry total requirements would need to be multiplied by the employment-to-output ratio to obtain the job multipliers at the level of aggregation desired.<sup>50</sup> Due to the lack of access to U.S. input-output tables corresponding to the level of each exports categories, this study used several methods of approximation, depending on the type of export:

- For goods exports with unavailable BLS job multipliers, the export jobs were calculated based on the sum of their four-digit NAICS subcomponents exports (only the production share, without the margin) multiplied by the corresponding four-digit NAICS job multipliers
- For service exports which are sales of several NAICS industries, this study uses an average of the job multipliers of the NAICS components, weighted by these components' share in their combined U.S. GDP. For example, computer and information services exports represent data entry processing (both batch and remote) and tabulation; computer systems analysis, design, and engineering; custom software and programming services (including web design); integrated hardware/software system provided to foreign residents. This study estimates that three industries, computer

Systems Design and Related Services (5415); Data Processing, Hosting, and Related Services (518); and Other Information Services (519) provide these services. Because BLS has separate job multipliers for 5415 and 518+519, this report estimates the share of 5415 and the share of 518+519 out of the sum of 5415, 518, 519 U.S. GDP for each year analyzed. Then, it applies those shares to each BLS multiplier and creates a job multiplier, as a weighted sum to be used for computer and information services exports

- For royalties' exports, this report uses a similar method as for service exports without BLS job multipliers. If any of the industries which receive receipts from royalties (based on IRS returns of all active companies) does not have a BLS job multiplier, this study calculates a weighted job multiplier, based on the job multipliers of its NAICS components and weighted by these components' share in their combined U.S. GDP. The number of jobs supported by royalties paid by foreign residents is the sum of the number of jobs supported by each industry royalties' exports. The method for estimating royalties calculates industry royalties' exports at the U.S. level (See previous section of the Appendix—Estimation Method for Metropolitan Exports)
- For education exports, this study uses the BLS job multiplier for junior colleges, colleges, universities, and professional schools
- The only export for which this study does not use BLS multipliers is travel and tourism, which represents the combined expenditures of foreign tourists and the value of the passenger fares paid by foreign residents to U.S. air carriers for their flight to the United States. Instead of the BLS multipliers, this report uses for direct export-production jobs the ratio of the BEA direct tourism employment over the direct output of U.S. travel and tourism (domestic and international). For total export-supported jobs, it divides the BEA total tourism employment (direct and indirect) over the direct output of U.S. travel and tourism

This method suffers from a number of shortcomings:

- It is not based on employment requirements table aggregated at the level of the export category
- It estimates the job multipliers for several export categories
- The job multipliers are based on employment-production relationships at the level of the U.S. economy, not at the sub-national geographical level analyzed. Therefore, they do not reflect the input-output relationships existent in every geographical level analyzed (county, metro area, state) and the spatial variation of the industry employment-output relationship
- The BLS job multipliers over-adjust for the effect of foreign-value-added in U.S. production. BLS releases a series of job multipliers, which remove the employment effect of imports. However, not the entire value of imports is foreign-value-added, some of it being U.S. value-added returning to the United States.
- It uses a 2002 detailed input-output table USE table to calculate production, transportation, and wholesale trade shares of goods exports, given that this is the latest available

This edition's export-supported jobs methodology improves on the export employment method employed in the previous edition. A panel data analysis for the 34 U.S. export categories, between 2003-2010, shows that the U.S. exports series has a stronger association with U.S. export jobs estimates based on the present job multiplier method (93.9 percent) than with the jobs estimates based on the method used in the previous edition (85.7 percent).

**Appendix Table 1. Export Performance of the Largest 100 Metropolitan Areas, 2010**

Rank, Exports Value, Largest 100 Metro Areas	Metropolitan Area	Exports Value, 2010 (billions \$)	Exports Share of GDP, 2010	Direct Export-Production Jobs, 2010 (thousands)	Total Export-Supported jobs, 2010 (thousands)	Annualized Export Growth Rate, By Value, 2003-2008			Exports Growth Rate, By Value, 2009-2010
						2003-2008	2009-2010	2009-2010	
1	Los Angeles-Long Beach-Santa Ana, CA	79.8	10.9%	312.7	540.7	7.7%	7.7%	9.0%	8.9%
2	New York-N New Jersey-L Long Island, NY-NJ-PA	78.0	6.6%	329.0	539.3	7.1%	7.3%	11.8%	11.8%
3	Chicago-Joliet-Naperville, IL-IN-WI	53.9	10.9%	197.6	376.1	7.3%	14.5%	12.1%	12.1%
4	Houston-Sugar Land-Baytown, TX	47.9	14.0%	141.3	307.0	11.1%	10.7%	10.7%	10.7%
5	Dallas-Fort Worth-Arlington, TX	41.1	12.7%	147.2	279.7	13.7%	8.2%	8.2%	8.2%
6	San Francisco-Oakland-Fremont, CA	31.8	11.2%	110.0	194.3	104.4	188.4	17.2%	10.2%
7	Seattle-Tacoma-Bellevue, WA	29.0	13.7%	79.1	186.3	0.3%	0.3%	13.3%	13.3%
8	Detroit-Warren-Livonia, MI	26.6	14.9%	97.0	174.1	6.1%	6.1%	12.7%	12.7%
9	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	26.6	8.5%	72.9	144.8	4.6%	4.6%	12.2%	12.2%
10	Boston-Cambridge-Quincy, MA-NH	26.4	8.9%	118.9	196.0	14.8	14.8	16.0%	16.0%
11	San Jose-Sunnyvale-Santa Clara, CA	22.8	18.0%	70.3	142.4	18.6%	18.6%	7.7%	7.7%
12	Portland-Vancouver-Hillsboro, OR-WA	21.3	18.2%	88.3	151.7	117.2	117.2	10.8%	10.8%
13	Atlanta-Sandy Springs-Marietta, GA	20.0	8.0%	66.7	117.1	100.2	146.2	5.5%	11.6%
14	Minneapolis-St. Paul-Bloomington, MN-WI	17.6	9.8%	63.2	117.1	35.7	35.7	2.9%	10.4%
15	Phoenix-Mesa-Glendale, AZ	16.6	9.1%	75.1	115.4	81.0	81.0	9.9%	9.9%
16	Washington-Arlington-Alexandria, DC-VA-MD-WV	16.4	4.2%	83.0	134.4	113.4	113.4	11.1%	11.1%
17	San Diego-Carlsbad-San Marcos, CA	16.0	9.3%	49.0	94.9	76.8	76.8	7.2%	13.1%
18	Indianapolis-Carmel, IN	15.9	17.2%	38.2	74.6	49.0	49.0	6.6%	6.6%
19	Miami-Fort Lauderdale-Pompano Beach, FL	14.7	6.2%	35.7	74.6	94.9	94.9	9.0%	9.0%
20	St. Louis, MO-IL	14.4	11.5%	33.1	67.6	72.8	72.8	12.1%	11.9%
21	Cleveland-Elyria-Mentor, OH	12.1	12.4%	38.2	74.4	68.4	68.4	5.5%	11.1%
22	Cincinnati-Middletown, OH-KY-IN	11.6	12.2%	44.5	74.6	66.0	66.0	4.6%	13.2%
23	Pittsburgh, PA	11.1	9.5%	40.0	67.6	67.6	67.6	9.5%	9.5%
24	Riverside-San Bernardino-Ontario, CA	10.9	8.3%	39.4	73.6	57.5	57.5	8.1%	8.1%
25	Denver-Aurora-Broomfield, CO	10.2	7.2%	33.1	59.8	59.8	59.8	11.1%	11.1%
26	Charlotte-Gastonia-Rock Hill, NC-SC	9.8	10.7%	47.8	66.0	66.0	66.0	9.8%	9.8%
27	Baltimore-Towson, MD	9.7	6.7%	31.3	58.0	58.0	58.0	12.7%	12.7%
28	Milwaukee-Waukesha-West Allis, WI	9.3	12.3%	29.6	61.0	64.4	64.4	13.5%	13.5%
29	Hartford-West Hartford-East Hartford, CT	8.9	9.3%	31.7	57.5	57.5	57.5	10.3%	10.3%
30	New Orleans-Metairie-Kenner, LA	8.7	14.3%	21.6	46.0	46.0	46.0	8.6%	8.6%
31	Austin-Round Rock-San Marcos, TX	8.5	10.5%	34.2	57.5	57.5	57.5	5.8%	5.8%
32	Kansas City, MO-KS	8.1	8.6%	30.2	64.4	64.4	64.4	2.8%	2.8%
33	Rochester, NY	8.1	13.6%	23.0	58.0	58.0	58.0	11.2%	11.2%
34	Tampa-St. Petersburg-Clearwater, FL	8.0	6.8%	47.8	58.0	58.0	58.0	11.4%	11.4%
35	Columbus, OH	7.9	8.9%	29.5	56.5	56.5	56.5	8.0%	8.0%
36	Las Vegas-Paradise, NV	7.4	8.4%	43.7	60.0	60.0	60.0	11.1%	11.1%
37	Orlando-Kissimmee-Sanford, FL	7.3	7.0%	37.8	55.5	55.5	55.5	11.1%	11.1%
38	Baton Rouge, LA	7.3	18.3%	16.6	46.0	46.0	46.0	11.1%	11.1%

**Appendix Table 1. Export Performance of the Largest 100 Metropolitan Areas, 2010 (continued)**

Rank, Exports Value, Largest 100 Metro Areas	Metropolitan Area	Exports Value, 2010 (billions \$)	Exports Share of GDP, 2010	Annualized Export Growth Rate, By Value, 2003-2008		
				Direct Export-Production Jobs, 2010 (thousands)	Total Export-Supported jobs, 2010 (thousands)	Growth Rate, By Value, 2009-2010
39	Bridgeport-Stamford-Norwalk, CT	7.0	10.6%	23.5	45.0	12.5%
40	Nashville-Davidson-Murfreesboro-Franklin, TN	7.0	9.6%	24.6	48.2	6.9%
41	Virginia Beach-Norfolk-Newport News, VA-NC	6.8	8.0%	21.9	40.2	8.4%
42	San Antonio-New Braunfels, TX	6.7	7.9%	26.7	46.8	11.3%
43	Salt Lake City, UT	6.6	10.8%	27.0	52.4	12.3%
44	Greensboro-High Point, NC	6.5	17.3%	17.9	40.7	6.4%
45	Providence-New Bedford-Fall River, RI-MA	6.4	9.1%	25.3	46.5	5.0%
46	Buffalo-Niagara Falls, NY	6.4	9.9%	23.0	45.2	6.0%
47	Louisville-Jefferson County, KY-IN	6.4	11.5%	19.2	43.8	5.6%
48	Oxnard-Thousand Oaks-Ventura, CA	6.2	15.7%	16.6	34.2	7.7%
49	Sacramento-Arden-Arcade-Roseville, CA	6.0	5.9%	26.8	44.3	8.1%
50	Tulsa, OK	5.5	13.8%	18.9	36.4	14.7%
51	Richmond, VA	5.4	8.0%	18.7	37.8	5.9%
52	Grand Rapids-Wyoming, MI	5.4	15.3%	15.6	35.9	3.2%
53	Raleigh-Cary, NC	5.4	10.0%	17.0	33.2	18.6%
54	Memphis, TN-MS-AR	5.4	9.1%	18.1	37.2	8.2%
55	Wichita, KS	5.3	20.4%	16.5	32.9	16.0%
56	New Haven-Milford, CT	4.3	9.0%	15.1	28.1	8.0%
57	Birmingham-Hoover, AL	4.3	9.1%	11.6	24.7	14.1%
58	Toledo, OH	4.1	15.0%	11.1	25.6	3.7%
59	Oklahoma City, OK	4.1	7.6%	16.0	29.0	9.7%
60	Jacksonville, FL	4.0	6.7%	16.0	27.9	10.2%
61	Bakersfield-Delano, CA	4.0	10.5%	12.1	23.9	14.4%
62	Greenville-Mauldin-Easley, SC	3.9	14.9%	13.9	30.1	-1.4%
63	Dayton, OH	3.8	11.1%	12.7	25.9	2.6%
64	Fresno, CA	3.7	9.8%	14.5	28.5	9.3%
65	Omaha-Council Bluffs, NE-IA	3.7	8.5%	14.6	27.9	9.7%
66	Albany-Schenectady-Troy, NY	3.7	7.1%	15.3	27.0	10.0%
67	Tucson, AZ	3.6	9.9%	14.2	25.1	5.8%
68	Allentown-Bethlehem-Easton, PA-NJ	3.5	11.1%	11.6	23.4	1.9%
69	Worcester, MA	3.5	10.6%	12.1	23.3	5.4%
70	Albuquerque, NM	3.4	9.3%	15.3	25.7	-4.0%
71	Akron, OH	3.4	11.7%	10.8	22.5	5.6%
72	Syracuse, NY	3.3	8.7%	12.7	22.7	6.6%
73	Charleston-N. Charleston-Summerville, SC	2.9	11.4%	9.3	19.4	11.4%
74	Knoxville, TN	2.9	9.5%	10.9	21.8	5.9%
75	Youngstown-Warren-Boardman, OH-PA	2.9	15.0%	7.8	18.9	5.7%
76	Madison, WI	2.8	8.3%	10.9	19.6	7.4%



**Appendix Table 1. Export Performance of the Largest 100 Metropolitan Areas, 2010 (continued)**

Rank, Exports Value, Largest 100 Metro Areas	Metropolitan Area	Exports Value, 2010 (billions \$)	Exports Share of GDP, 2010	Direct Export-Production Jobs, 2010 (thousands)	Total Export-Supported jobs, 2010 (thousands)	Annualized Exports Growth Rate, By Value, 2003-2008 vs. 2009-2010	
						Export Growth Rate, By Value, 2003-2008	Growth Rate, By Value, 2009-2010
77	Honolulu, HI	2.7	5.4%	16.2	22.7	8.9%	6.8%
78	Columbia, SC	2.7	8.5%	9.5	20.1	4.8%	13.0%
79	Chattanooga, TN-GA	2.7	11.5%	9.3	19.3	6.5%	18.6%
80	Springfield, MA	2.5	8.6%	10.2	18.9	7.6%	14.2%
81	Palm Bay-Melbourne-Titusville, FL	2.5	13.2%	9.1	17.0	13.8%	8.6%
82	Des Moines-West Des Moines, IA	2.5	7.3%	10.1	19.4	9.1%	10.7%
83	Boise City-Nampa, ID	2.5	10.8%	8.6	17.1	7.3%	9.8%
84	Ogden-Clearfield, UT	2.5	13.7%	7.9	17.7	11.0%	13.2%
85	Roughlykeepsie-Newburgh-Middletown, NY	2.4	8.8%	7.9	15.4	5.7%	7.9%
86	Harrisburg-Carlisle, PA	2.2	7.0%	8.5	15.4	10.4%	8.3%
87	Portland-South Portland-Biddeford, ME	2.2	9.3%	6.7	12.3	10.0%	11.4%
88	Scranton-Wilkes-Barre, PA	2.2	9.1%	7.5	14.5	6.1%	7.4%
89	El Paso, TX	2.1	7.7%	8.2	15.1	6.3%	11.8%
90	Little Rock-North Little Rock-Conway, AR	2.0	6.6%	8.3	15.0	19.1%	7.1%
91	Stockton, CA	2.0	8.6%	7.5	15.3	7.4%	6.2%
92	Augusta-Richmond County, GA-SC	1.9	9.6%	6.7	14.3	4.7%	12.0%
93	Jackson, MS	1.9	8.3%	6.0	11.9	11.1%	6.8%
94	Modesto, CA	1.9	10.3%	6.3	13.4	7.7%	9.0%
95	Provo-Orem, UT	1.8	11.6%	5.9	11.2	12.8%	10.0%
96	Colorado Springs, CO	1.8	6.6%	7.6	12.8	5.0%	6.6%
97	North Port-Bradenton-Sarasota, FL	1.5	6.1%	5.9	10.3	9.8%	6.7%
98	Lakeland-Winter Haven, FL	1.4	7.3%	4.7	9.3	5.6%	8.8%
99	McAllen-Edinburg-Mission, TX	0.9	4.7%	3.5	5.9	8.6%	7.8%
100	Cape Coral-Fort Myers, FL	0.8	4.0%	4.2	6.3	9.9%	4.7%
<b>Largest 100 Metropolitan Areas</b>		<b>1,011.3</b>	<b>9.8%</b>	<b>3,731.5</b>	<b>6,897.8</b>	<b>8.0%</b>	<b>10.6%</b>
<b>United States</b>		<b>1,562.9</b>	<b>10.7%</b>	<b>5,542.3</b>	<b>10,719.9</b>	<b>8.0%</b>	<b>11.4%</b>

Note: The largest 100 metropolitan areas are selected by population.

Source: Brookings analysis of data from BEA, BLS, IRS, Moody's Analytics, NAFSA, and USITC

## Endnotes

1. Emilia Istrate, Alan Berube, and Carey Anne Nadeau, "Global MetroMonitor 2011: Volatility, Growth and Recovery" (Washington: Brookings Institution, 2012).
2. Emilia Istrate, Jonathan Rothwell, and Bruce Katz, "Export Nation: How U.S. Metros Lead National Export Growth and Boost Competitiveness" (Washington: Brookings Institution, 2010).
3. Trade Promotion Coordination Committee, *2011 National Export Strategy* (Trade Promotion Coordination Committee, 2011).
4. The White House, Government Reorganization Fact Sheet (The White House, 2012).
5. At the federal level, U.S. Census Bureau estimates goods exports and U.S. Bureau of Analysis estimates services exports. Some state trade offices collect and estimate their own state export series. There are a multitude of private entities that collect and estimate merchandise export data, such as PIERS, WISERTrade, and Trade Partnership.
6. Enterprise Florida uses an updated methodology originally developed by Dr. Raymond Fishe from the University of Miami, in collaboration with Dr. Claude Barfield from the American Enterprise Institute. From personal communication from Manny Mencia and Z. Joe Kulenovic, Enterprise Florida, February 15, 2012.
7. For more on the methodology and the accuracy of estimates, see Istrate, Rothwell, and Katz, "Export Nation."
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10. U.S. Bureau of Labor Statistics, *Employment Outlook 2010-2020* (U.S. Bureau of Labor Statistics, 2012).
11. U.S. Bureau of Economic Analysis, Table 2. *The Use of Commodities by Industries before Redefinitions* (U.S. Bureau of Economic Analysis, 2008).
12. There is an extensive literature on vertical specialization (foreign content in exports), foreign content in intermediate use, and trade in parts and components. The latest U.S. trade estimates based on value-added uses worldwide input-output tables for 2004. For more, see U.S. International Trade Commission, *The Economic Effects of Significant U.S. Import Restraints* (U.S. International Trade Commission, 2011).
13. Ibid. According to the World Trade Organization estimates, the 2008 U.S.-China trade deficit on a value-added basis would be more than 40 percent smaller than the official figures. See World Trade Organization, "Trade Patterns and Global Value Chains in East Asia" (2011).
14. Based on U.S. Bureau of Economic Analysis (BEA), Table 1.1.6. Real Gross Domestic Product, Chained Dollars, *National Income and Product Accounts Tables* (U.S. Department of Commerce, 2012).
15. The calculation for the nominal growth rate of exports is based on export values from the U.S. Bureau of Economic Analysis (BEA), Table 4.1. Foreign Transactions, *National Income and Product Accounts* (U.S. Department of Commerce, 2012). For the real growth rate of exports, see U.S. Bureau of Economic Analysis (BEA), Table 1.1.1. Percent Change from Preceding Period in Real Gross Domestic Product, *National Income and Product Accounts Tables* (U.S. Department of Commerce, 2012).
16. The 2011 real growth rate of exports was 6.8 percent, according to U.S. Bureau of Economic Analysis (BEA), Table 1.1.1.
17. U.S. Bureau of Economic Analysis (BEA), Table 1.1.1.
18. Based on U.S. Bureau of Economic Analysis (BEA), Table 1.1.5. Gross Domestic Product, *National Income and Product Accounts Tables* (U.S. Department of Commerce, 2012).
19. This update estimates 11.5 million total export-supported jobs in the United States in 2008. For more on the differences between the estimation of export jobs in the first and second edition of "Export Nation," See Appendix A.
20. These rankings are valid only for countries. When the rankings include the extra-EU (27) exports, the United States ranks second in terms of total exports, No. 3 in terms of merchandise and No. 2 in terms of service exports. For the comparison between the United States and Germany on merchandise exports, see the World Trade Organization (WTO), "International Trade Statistics 2009" (2009); The World Trade Organization (WTO), "International Trade Statistics 2011" (2011).

21. This study uses the annualized 2003-2008 export growth rate to proxy the pre-recession rate, because it estimates the series of metropolitan exports between 2003 and 2010. While it would be useful to use a longer-term growth rate, the quality and availability of public data limit the estimation of metropolitan exports for a longer time-series.
22. The International Monetary Fund, "World Economic Outlook: Tensions from the Two-Speed Recovery: Unemployment, Commodities, and Capital Flows" (2011).
23. This calculation is based on Gross Domestic Product (GDP) on a purchasing-power-parity (PPP) valuation. Even when comparing these countries' economies on a current-prices-basis, the BICs will become larger than the United States in less than ten years. Source for the estimates: The International Monetary Fund, "World Economic Outlook Database" (2011).
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26. The U.S. International Trade Commission, "China: Effects of Intellectual Property Infringement and Indigenous Innovation Policies on the U.S. Economy" (2011).
27. U.S. Government Accountability Office (GAO), *U.S. and Foreign Commercial Service Should Improve Performance and Resource Allocation Management* (U.S. Government Accountability Office, 2011).
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33. "Region Stuttgart at EXPO REAL," available at <http://exporeal.region-stuttgart.de/index.html> (January 2012)
34. U.S. Bureau of Economic Analysis, *Regional Definitions-County*, available at <http://www.bea.gov/regional/definitions/nextpage.cfm?key=County> (January 25, 2011).
35. The Office of Management and Budget (OMB) defines metropolitan statistical areas (MSAs) as regions with "at least one urbanized area of 50,000 or more population, plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties." U.S. Office of Management and Budget, "Update of Statistical Area Definitions and Guidance on Their Uses," *OMB Bulletin No. 10-02* (United States Office of Management and Budget, 2009).
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37. The U.S. goods export codes are based on the Harmonized System (HS) established by the World Customs Organization (WCO). These codes are administered by the U.S. Census Bureau in the Schedule B, an approximately 8,000 commodity classifications. U.S. Census Bureau also classifies U.S. output by industry according to the North American Industry Classification System (NAICS) since 1997. While the U.S. export codes are based on product characteristics, the NAICS codes may also take into account the method of production. They do not overlap entirely, but U.S. Census Bureau developed a matching system between the HS and NAICS. See U.S. Census Bureau, Commodity Master Record Layout (U.S. Department of Commerce, 2009), available at <http://www.census.gov/foreign-trade/reference/products/catalog/cmdtymst.html>. For a discussion of the relationship between the HS and NAICS codes, see Justin R. Pierce and Peter K. Schott, "A Concordance Between Ten-Digit U.S. Harmonized System Codes and SIC/NAICS Product Classes and Industries." Working Paper 09-41 (U.S. Census Bureau Center for Economic Studies, 2009).
38. This study analyzes only cross-border services sales. For cross-border trade, the *Quarterly Survey of Transactions in Selected Services and Intangible Assets with Foreign Persons* and the *Quarterly Survey of Transactions between U.S. Financial Services Providers and Foreign Persons* collect data on the majority of commercial services exports. For more information, see Jennifer Koncz-Bruner and Anne Flatness, "U.S. International Services—Cross-Border Trade in 2010 and Services

- Supplied Through Affiliates in 2009" (U.S. Department of Commerce, 2011).
39. The Census Bureau reports in its Service Annual Survey the estimated export revenue of establishments in select industries by NAICS. However, this survey does not provide export estimates for a number of important service industries such as travel or passenger transportation. Unlike the HS-NAICS goods match-up by Census, there is no concordance table for the service exports by NAICS and the BEA service exports category. This is understandable, given that services are not provided only by service industries. For example, manufacturing firms can export services, by the receipt of royalties' payments from foreign residents. Due to the lack of detail beyond four-digit NAICS for GMP by industry in the Moody's Analytics dataset, this study restricted the match-up for services exports to four-digit NAICS level. While more NAICS digit numbers would allow for a deep-dive into industry identification, this report uses this match-up only to calculate the metro industry share out of the national total.
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41. The USITC goods exports are on a Census basis, while the BEA services exports are on a balance-of-payments (BOP) basis. The BEA adjusts the goods exports estimates to bring them to a BOP basis, in order to have a more accurate value of U.S. total exports. However, the differences between the Census basis and the BOP basis are very small at the national level– the sum of total U.S. goods exports on a Census basis and services exports on a BOP basis was 99.4 percent of the BEA U.S. total exports ( on a BOP basis) in 2010. For more information on the definitions and differences between Census basis and BOP basis, see U.S. International Trade Administration, *Trade Data Basics* (U.S. Department of Commerce, 2009), available at [http://ita.doc.gov/td/industry/otea/trade\\_data\\_basics.html#exports](http://ita.doc.gov/td/industry/otea/trade_data_basics.html#exports)
42. The Gross Metropolitan Product (GMP) is the Gross Domestic Product counterpart at the metropolitan level. In the same vein as the national indicator, the GMP by industry shows the value-added produced by that industry in a certain metropolitan area.
43. The first edition of "Export Nation" constructed two alternative export estimates based on employment for 2007, using Moody's Analytics series and U.S. Census County Business Patterns database. These series exhibited correlation coefficients of 0.98 and 0.97 respectively with the first edition of "Export Nation" output-based export estimates.
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46. The BEA estimates a provisional county output, by allocating the state output based on the county share of the earnings in a certain industry from the state earnings in the same industry. These provisional county outputs are added to the level of a metropolitan area to produce the Gross Domestic Product by metro area (or Gross Metropolitan Product). See U.S. Bureau of Economic Analysis (BEA), *Introducing New Measures of the Metropolitan Economy* (U.S. Department of Commerce, 2007).
47. While this method allows for the inclusion of wider range of royalties-earning industries, it does not take into consideration the different locations of the production and research-and-development facilities of a company, due to lack of data.
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