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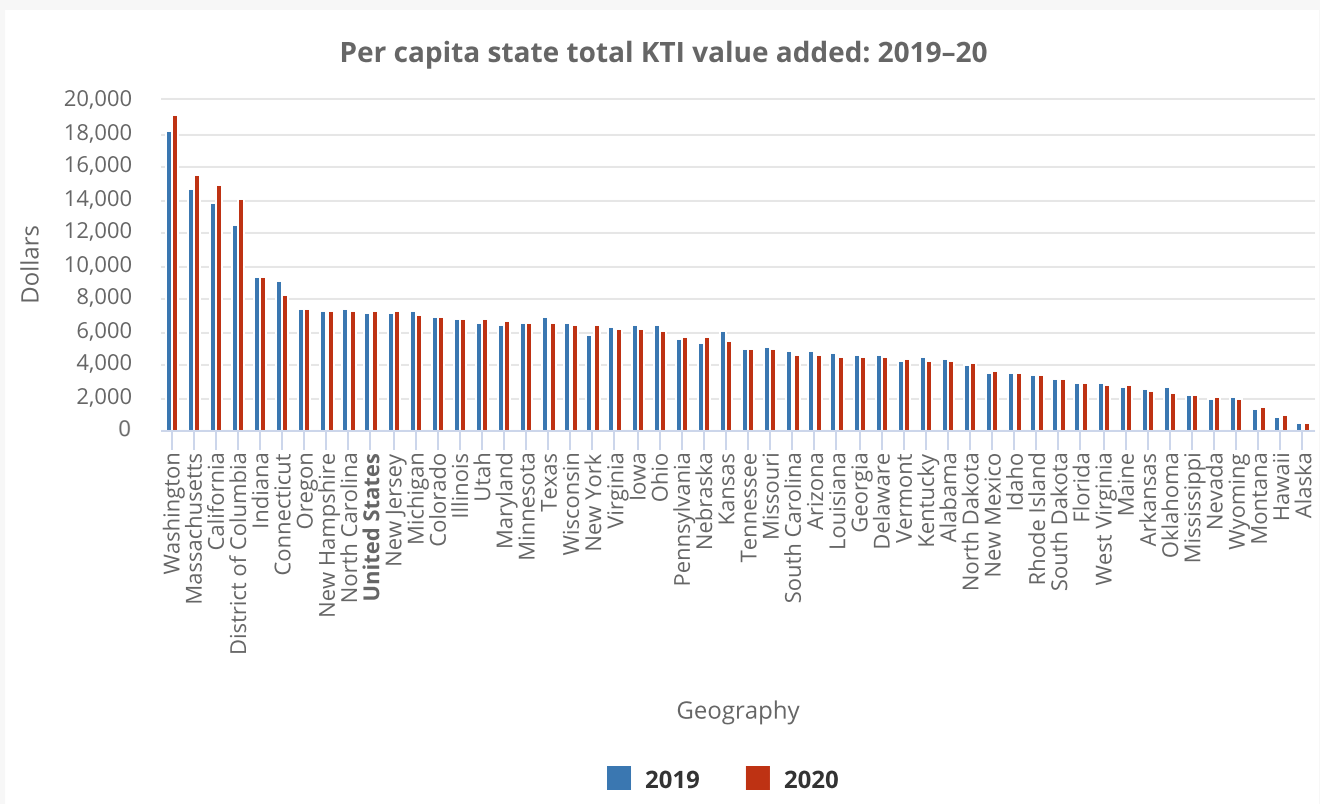
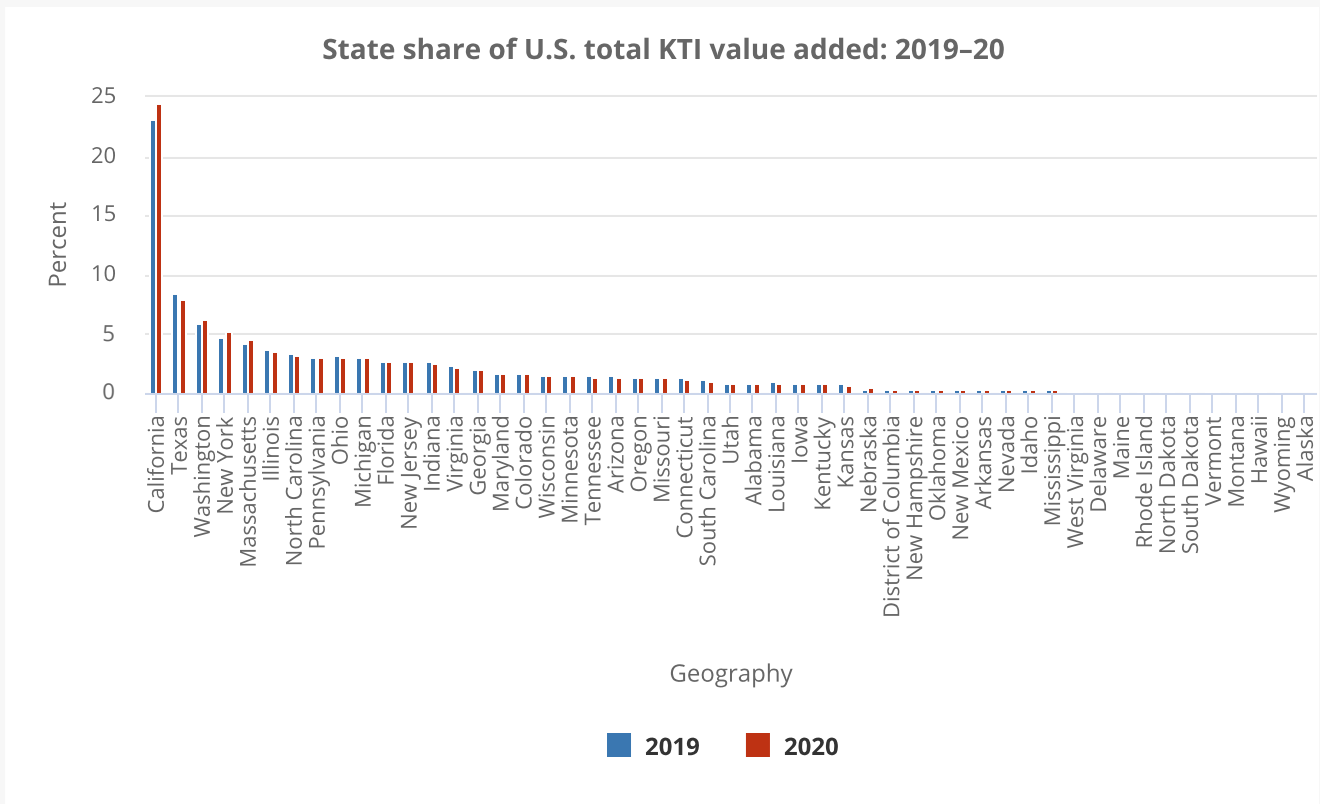
Geography of KTI Production in the United States

This report presents regional analysis on knowledge- and technology-intensive (KTI) production in the United States. It provides insights on the geographic distribution of U.S. KTI production, the contribution of KTI industries to states' economies, and the regional specialization of KTI production.

KTI production in the United States is concentrated in a few states. By far, California accounted for the largest share of U.S. total KTI value added (25%) in 2020 (Figure KTI-A). The states with the next largest shares were Texas (8%), Washington (6%), and New York (5%). Massachusetts, Illinois, North Carolina, Pennsylvania, Ohio, Michigan, Florida, New Jersey, Indiana, Virginia, and Georgia each had shares of the U.S. total KTI value added between 2% and 4%. These top 15 states jointly accounted for 76% of the total value added generated by U.S. KTI industries in 2020.

Figure KTI-A

State share of U.S. total KTI value added and per capita state total KTI value added: 2019–20



KTI = knowledge and technology intensive; nec = not elsewhere classified.

Note(s):

Value added is a net measure of output; it is the difference between the value of goods and services produced by an industry (gross output) and the total cost of intermediate inputs that were used in production including energy, materials, and services purchased from other businesses. *Industry value added* is a measure of an industry's contribution to overall gross domestic product. KTI industries include high R&D intensive and medium-high R&D intensive industries based on a classification by the Organisation for Economic Co-operation and Development. High R&D intensive industries include air and spacecraft and related machinery; pharmaceuticals; computer, electronic, and optical products; scientific research and development; and software publishing. Medium-high R&D intensive industries include motor vehicles, trailers, and semi-trailers; medical and dental instruments; machinery and equipment nec; chemicals and chemical products; electrical equipment; railroad, military vehicles, and transport nec; and information technology and other information services. The underlying industry data are based on the International Standard Industrial Classification, Revision 4.

Source(s):

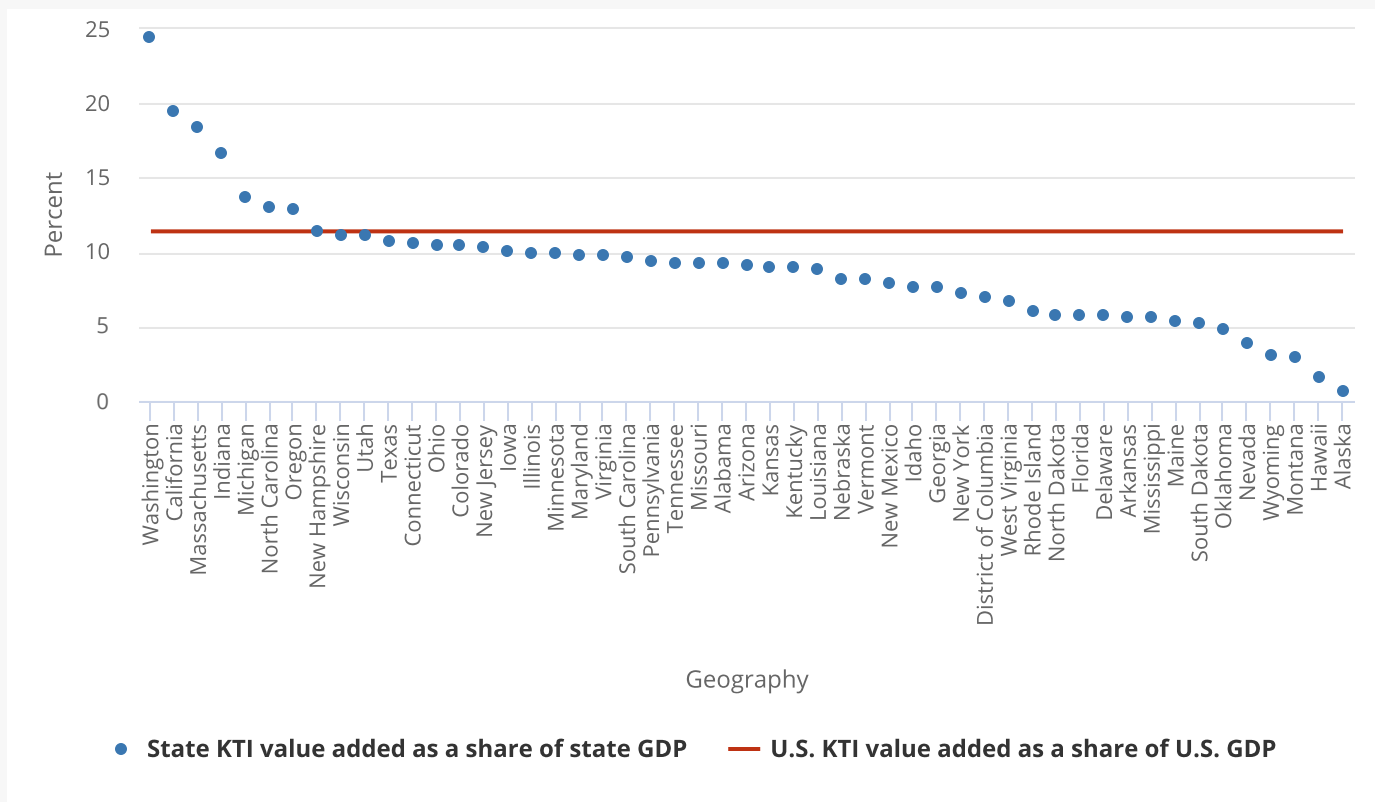
U.S. Bureau of Economic Analysis, Annual Gross Domestic Product (GDP) by State, special tabulations, October 2021.

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These rankings change moderately when looking at KTI value added per capita. Washington, Massachusetts, and California were the top 3 states in per capita terms, each with nearly \$15,000 or more per capita total KTI value added in 2020 (Figure KTI-A). The District of Columbia followed with a per capita value of more than \$14,000. To put this into context, the average per capita KTI value added for the United States was \$7,245 in 2020. Other states with per capita values higher than the national average were Indiana, Connecticut, Oregon, New Hampshire, and North Carolina.

KTI production as a share of the states' economies varies widely across states. On average, U.S. KTI production accounted for about 11% of gross domestic product (GDP) in 2020. The KTI share of state GDP varied from over 24% in Washington to less than 1% in Alaska (Figure KTI-B). California, Massachusetts, Indiana, Michigan, North Carolina, and Oregon also had KTI industries that make up larger than average shares of the state's economy (13%–19%).

Figure KTI-B

KTI value added as a share of U.S. and state GDP: 2020

GDP = gross domestic product; KTI = knowledge and technology intensive; nec = not elsewhere classified.

Note(s):

Value added is a net measure of output; it is the difference between the value of goods and services produced by an industry (gross output) and the total cost of intermediate inputs that were used in production including energy, materials, and services purchased from other businesses. *Industry value added* is a measure of an industry's contribution to overall GDP. KTI industries include high R&D intensive and medium-high R&D intensive industries based on a classification by the Organisation for Economic Co-operation and Development. High R&D intensive industries include air and spacecraft and related machinery; pharmaceuticals; computer, electronic, and optical products; scientific research and development; and software publishing. Medium-high R&D intensive industries include motor vehicles, trailers, and semi-trailers; medical and dental instruments; machinery and equipment not elsewhere classified nec; chemicals and chemical products; electrical equipment; railroad, military vehicles, and transport nec; and information technology and other information services. The underlying industry data are based on the International Standard Industrial Classification, Revision 4.

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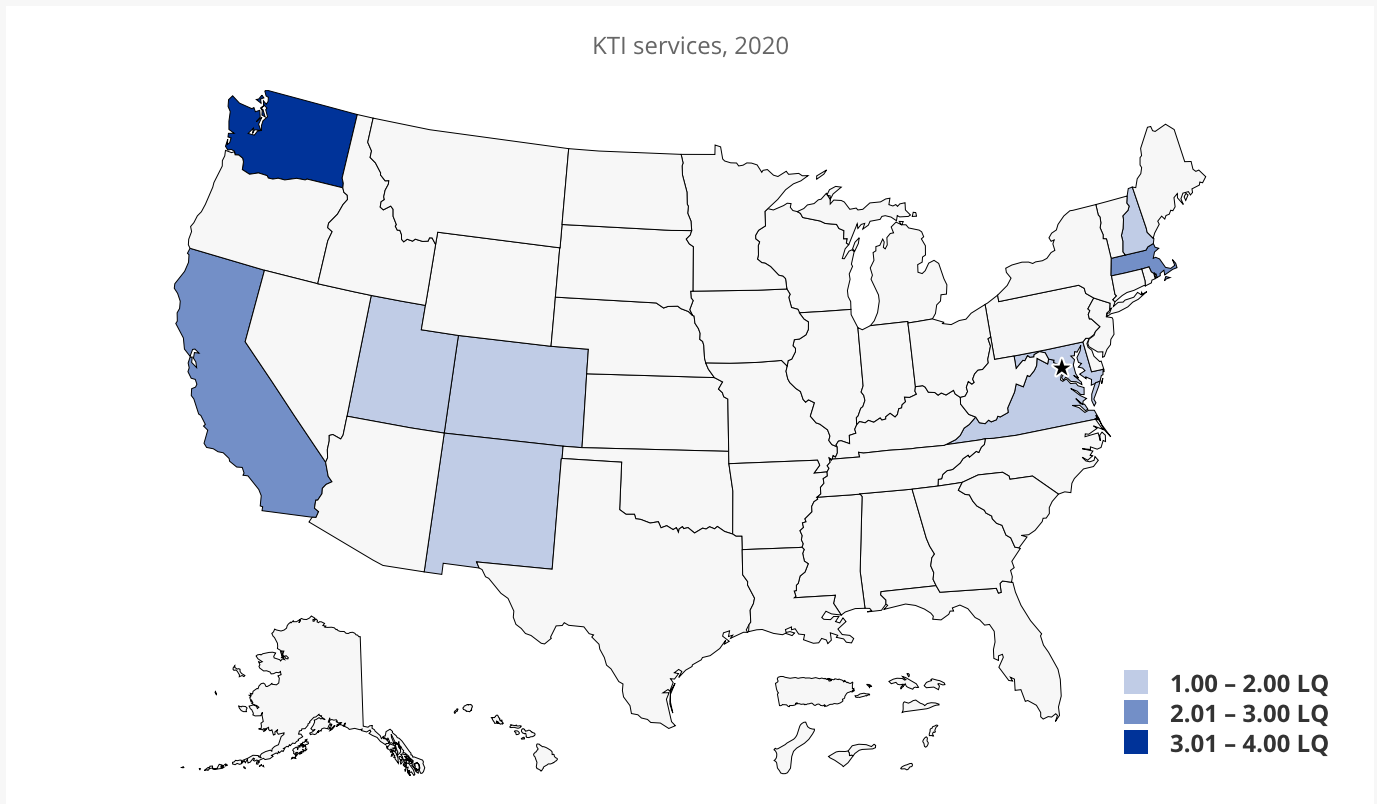
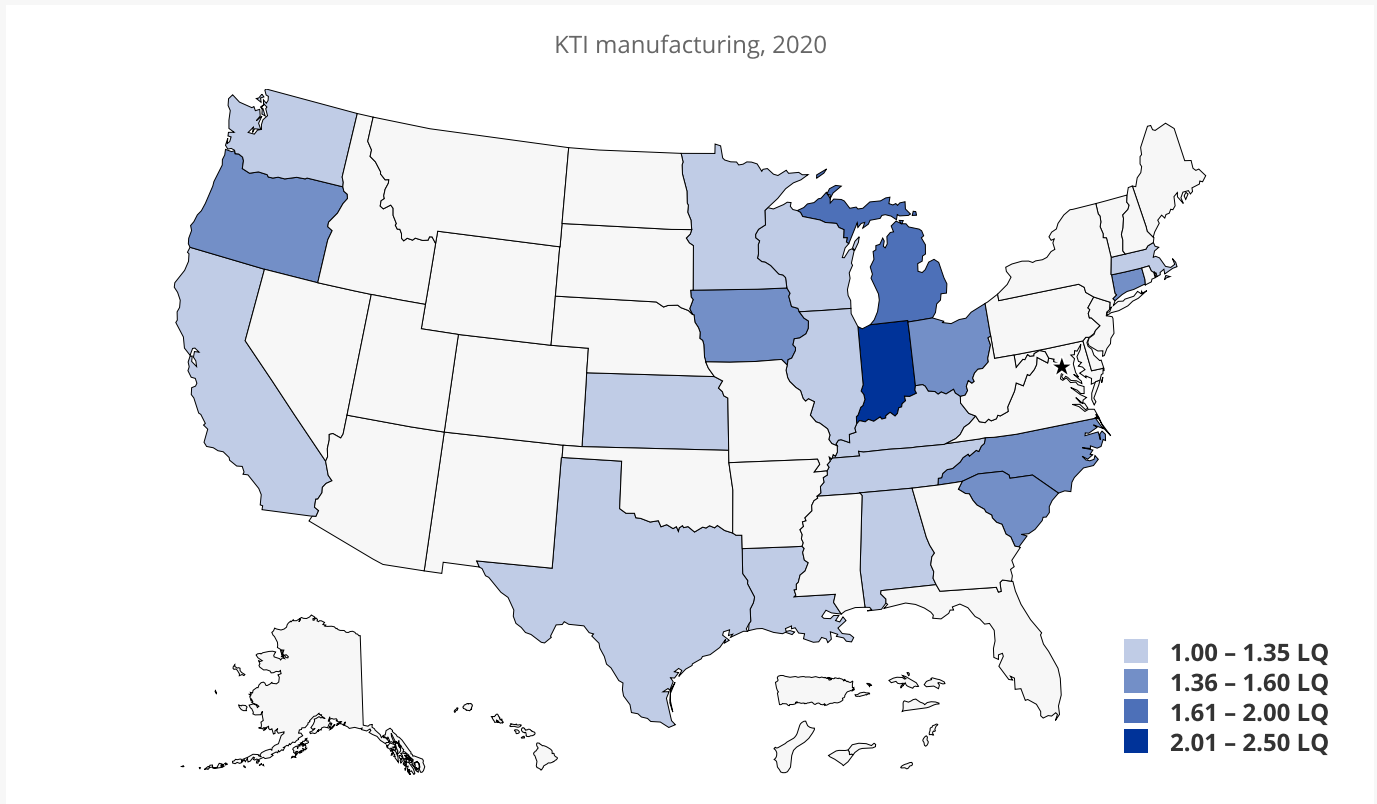
U.S. Bureau of Economic Analysis, Annual Gross Domestic Product (GDP) by State, special tabulations, October 2021.

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Industry specialization of KTI production also varies by state. A way to quantify industry specialization is by computing location quotients (LQ),* a statistic that compares an industry's share of a region's GDP with the corresponding industry's share of national GDP (Carroll, Reid, and Smith 2008; Chiang 2009; Crawley, Beynon, and Munday 2013). The LQ analysis shows that KTI manufacturing is concentrated in the Midwest, along the coasts, and a few states in the South (Figure KTI-C). KTI services are primarily concentrated along the coasts and a few Southwestern states (Utah, Colorado, and New Mexico).

Figure KTI-C

Specialization in KTI industry production, by state: 2020



KTI = knowledge and technology intensive; nec = not elsewhere classified.

Note(s):

Location quotient (LQ) is the ratio of a KTI industry's share of a state's gross domestic product (GDP) to the corresponding industry's share of national GDP. Only states with LQ > 1.00 are shown. KTI industries include high R&D intensive and medium-high R&D intensive industries based on a classification by the Organisation for Economic Co-operation and Development. KTI manufacturing industries are chemicals and chemical products; pharmaceuticals; computer, electronic, and optical products; electrical equipment; machinery and equipment nec; motor vehicles, trailers, and semi-trailers; air and spacecraft and related machinery; railroad, military vehicles, and transport nec; and medical and dental instruments. KTI services industries are information technology and other information services; software publishing, and scientific research and development. The underlying industry data are based on the International Standard Industrial Classification, Revision 4. Calculations are performed on unrounded numbers.

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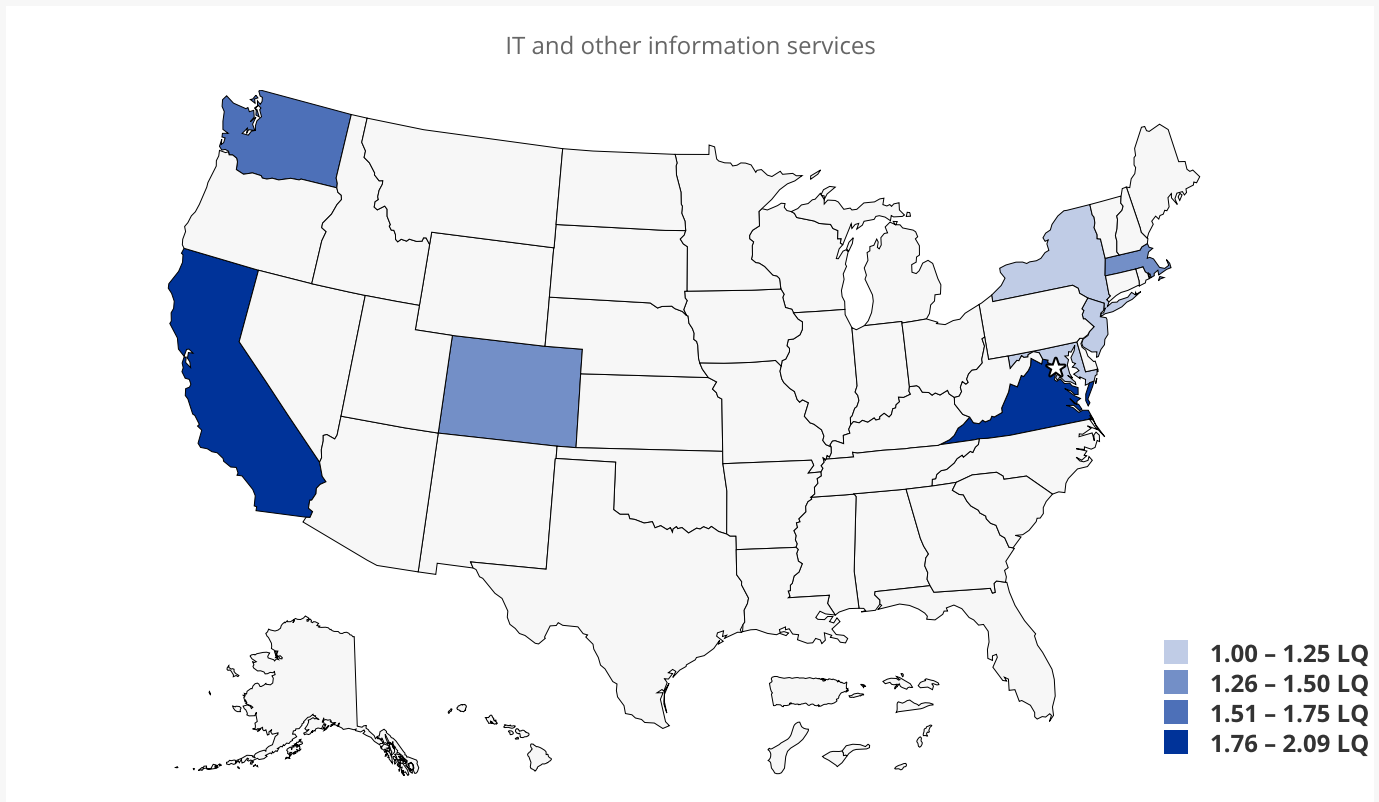
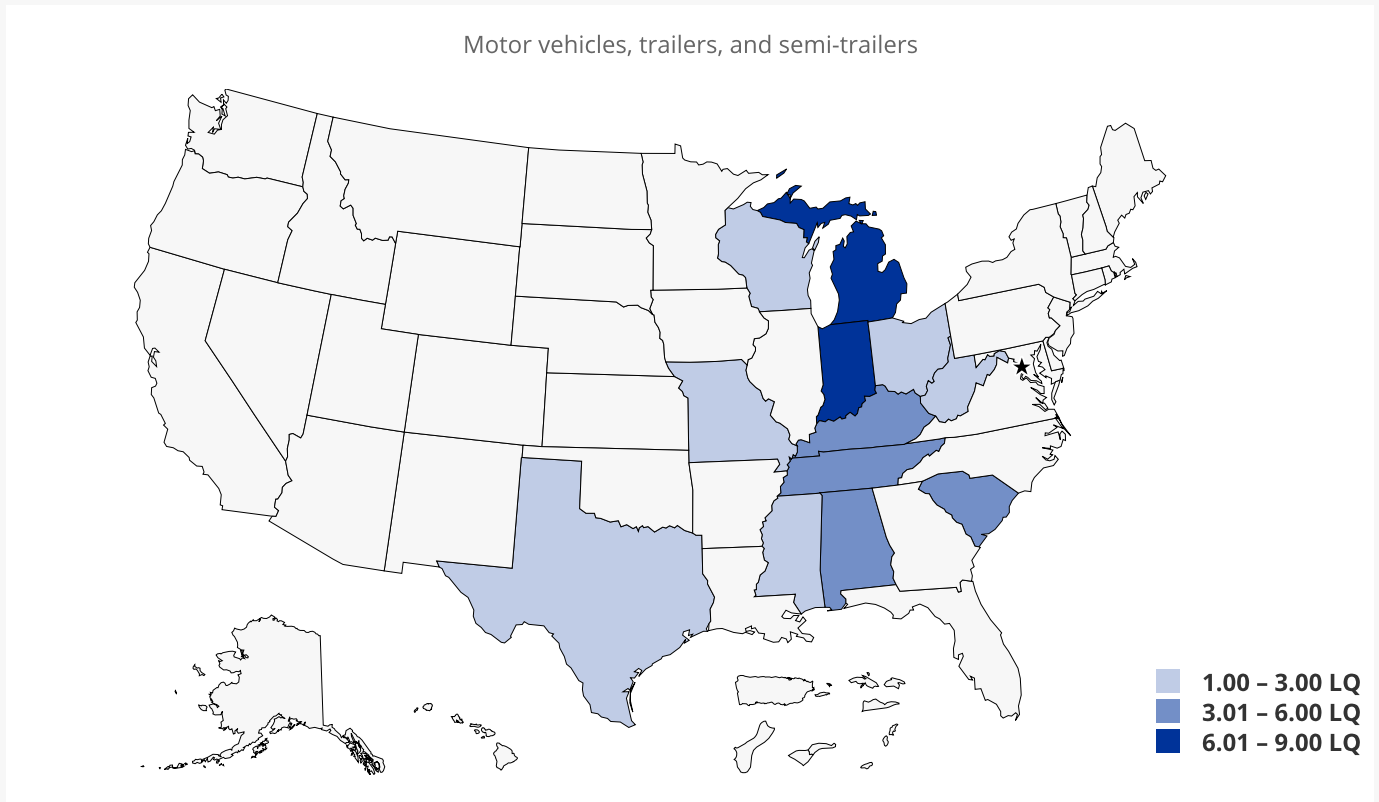
U.S. Bureau of Economic Analysis, Annual Gross Domestic Product (GDP) by State, special tabulations, October 2021.

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The LQ analysis for two detailed KTI industries shows that states on the coasts are relatively more specialized in production of information technology (IT) and other information services, whereas states in the Midwest are more specialized in the production of motor vehicles (Figure KTI-D). In particular, California and Virginia are the two states most specialized in IT and other information services as their value-added-to-GDP ratio was more than twice the national average in 2020. Michigan, Indiana, and Kentucky are the most specialized in motor vehicles manufacturing with valued-added-to-GDP ratios more than five times the national average. Other states with high specialization in motor vehicles manufacturing are Tennessee, Alabama, South Carolina, Mississippi, and Ohio.

Figure KTI-D

Specialization in production for two selected industries, by state: 2020



IT = information technology; KTI = knowledge and technology intensive.

Note(s):

Location quotient (LQ) is the ratio of a KTI industry's share of a state's gross domestic product (GDP) to the corresponding industry's share of national GDP. Only states with LQ > 1.00 are shown. KTI industries include high R&D intensive and medium-high R&D intensive industries based on a classification by the Organisation for Economic Co-operation and Development. The industry data are based on the International Standard Industrial Classification, Revision 4. Calculations are performed on unrounded numbers.

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* An LQ of 1.0 in a given industry means that the region and the nation are equally specialized in the industry. An LQ greater than 1.0 in an industry means that the region is relatively more specialized than the nation in that industry.