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Center for Economic Development and Business Research

Kansas Metropolitan Area Patenting Activity

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“Inventions, embodied in patents, are a major driver of long-term regional economic performance, especially if the patents are of higher quality. In recent decades, patenting is associated with higher productivity growth, lower unemployment rates, and the creation of more publicly traded companies. The effect of patents on growth is roughly equal to that of having a highly educated workforce. A low-patenting metro area could gain \$4,300 more per worker over a decade’s time, if it became a high-patenting metro area.”¹

The importance of quality patenting activity to economic growth, as stated in this recent report by The Brookings Institution, has long been supported by academic research. However, the data provided with this report provides the unique opportunity to more closely examine trends in patenting activity in Kansas and its metropolitan areas.

In 2012 there were 2,756 patents granted to inventors living in the state of Kansas, 0.8 percent of the total patents granted in the United States.² This level of patenting activity ranked Kansas in the middle of the 50 states. It was above the median value (2,508) of patents issued to inventors in a state, but well below the average of 6,937.

There was a wide range of patenting activity among the states in 2012. Inventors living in California accounted for the highest level of patenting activity, receiving 26.5 percent of all patents granted in the United States. The next three highest were New York, Texas and Washington at 6.6 percent, 6.5 percent and 5.2 percent, respectively. There were also 14 states with fewer than 1,000 patents granted in 2012.

Kansas 2012 Patent Activity

	Value	Rank*
Patents granted to inventors living in state	2,756	25
Patents per 1,000 workers	1.90	22
Annual growth in patents from 1980 to 2012	6.3%	16

Source: Strumsky Patent Database, The Brookings Institution

* Rank out of 50 states and the District of Columbia

Among the 50 states and the District of Columbia, there was also a wide range of patents per 1,000 workers in 2012. The average of patents per 1,000 workers was 1.96. Kansas was slightly below average at 1.90. California, Washington and Massachusetts had the highest patents per 1,000 workers at 6.15, 5.96 and 5.29, respectively.

Although the current level of patenting activity in Kansas is below the national average, the growth in patenting activity of 6.3 percent in Kansas between 1980 and 2012 was above the average annualized

¹ Rothwell, Jonathan, Jose Lobo, Deborah Strumsky, and Mark Muro (2013). [Patenting Prosperity: Invention and Economic Performance in the United States and its Metropolitan Areas](#). The Brookings Institution Metropolitan Policy Program

² The Strumsky Patent Database uses the whole count method of assigning patents to a geography. In the whole count method, a single patent is attributed to a metropolitan area every time an inventor patents who lives in that area.

rate among the states of 5.3 percent. Washington, Vermont and Idaho had the highest annualized growth in patents from 1980 to 2012 at 10.6 percent, 9.7percent and 9.0 percent, respectively.

The state level patenting activity can be broken down into activity in specific metropolitan areas. The majority of U.S. patenting activity, 92 percent, is concentrated in just 100 metropolitan areas.³

Kansas Metropolitan Area Patenting
Averages by Year of Application 2007-2011

	Patents per year		Patents per thousand workers		Claims per patent	
	Value	Rank*	Value	Rank*	Value	Rank*
Kansas City, Mo-KS	559	39	0.55	118	11.8	194
Lawrence, KS	36	190	0.70	87	13.2	133
St. Joseph, MO-KS	10	283	0.16	259	8.2	313
Topeka, KS	8	301	0.07	328	6.1	342
Wichita, KS	122	104	0.42	153	13.0	146

Source: Strumsky Patent Database, The Brookings Institution

* Rank out of 358 metropolitan areas

Patents per Year

Three of the top five metropolitan areas for patenting are in California. San Jose, San Francisco and Los Angeles ranked first (9,237), second (7,003), and fourth (5,456), respectively. California patent activity is primarily in computer hardware and peripherals, computer software and communications. New York ranked third with an average of 6,907 patents per year between 2007 and 2011. International Business Machines Corp. (IBM), which owns more patents granted from 2007 to 2012 than any other company, files many of its patents in the state of New York. When comparing the average number of patents across all metropolitan areas, the average is 299. Kansas City is the only Kansas metropolitan area above the national average, at an average of 559 per year.

Patents per 1,000 Workers

San Jose has the most patenting activity and the highest number of patents per 1,000 workers at 10.29. The metropolitan area with the second highest number of patents filed per 1,000 workers is Burlington, Vt., at 6.86, and third is Rochester, Minn., at 5.70. Both Burlington and Rochester have a high level of patent activity from IBM. The average across all metropolitan areas of the number of patents filed per 1,000 workers is 0.6. Lawrence is the only Kansas metropolitan area above the national average, with an average of 0.7 patents per 1,000 workers.

Claims per Patent

Claims per patent are a measure of the quality of the patent. They define the invention and the aspects that are legally enforceable. Claims are what the inventor regards as his invention or discovery.⁴ The

³ Rothwell, Jonathan, Jose Lobo, Deborah Strumsky, and Mark Muro (2013). [Patenting Prosperity: Invention and Economic Performance in the United States and its Metropolitan Areas](#). The Brookings Institution Metropolitan Policy Program

⁴ United States Patent and Trademark Office, Glossary

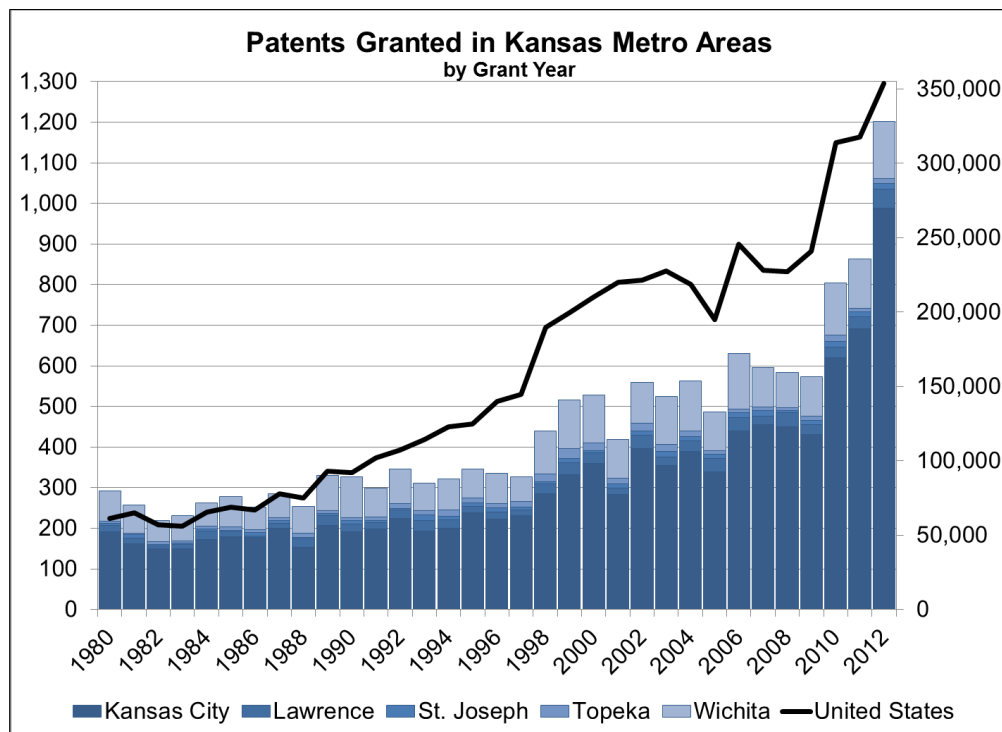
higher the number of claims per patent, the more new discovery is covered by the patent. The metropolitan areas with the highest claims per patent are Holland, Mich., Duluth, Minn., and Kingsport, Tenn., at 22.9, 22.1 and 20.4, respectively. The average number of claims per patent across all metropolitan areas is 12.1. Lawrence and Wichita are both above the national average in the number of claims per patent, at 13.2 and 13.0, respectively.

Annualized Growth Rate in Patents
by Year Granted

1980-2012	
Kansas City, MO-KS	5.1%
Lawrence, KS	3.4%
St. Joseph, MO-KS	2.8%
Topeka, KS	2.3%
Wichita, KS	2.0%

Source: Strumsky Patent Database, The Brookings Institution

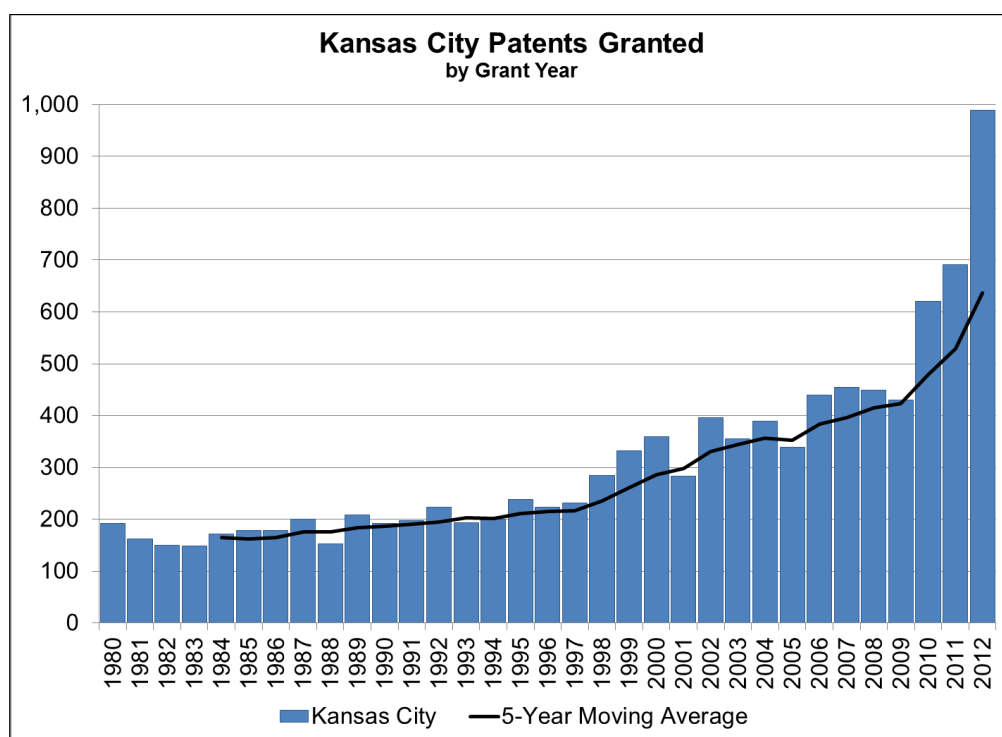
The annualized growth rate in patenting activity for the patents granted to inventors in the five Kansas metropolitan areas, for which data was available, was 4.4 percent. The Kansas City area has experienced the highest level of patenting activity, as well as the highest growth in patent activity between 1980 and 2012. Wichita has had the lowest level of growth and the second highest level of patent activity.



Patent activity declined across the country between 2007 and 2009, and then has grown at increasing rates since 2009. Although this growth pattern in recent years applies to the state of Kansas and the United States as a whole, the level of patent activity in some Kansas metropolitan areas has followed a much different path.

Kansas City

In recent years, the growth pattern in the Kansas City metropolitan area has more closely resembled the national growth pattern than any other metropolitan area in Kansas.⁵ Although there have been decreases in patenting activity in Kansas City when compared year over year, the five-year moving average has been positive since 1994. The growth rate of patenting activity in the Kansas City area increased considerably between 2009 and 2010 and continued to grow at a higher rate in 2011 and 2012.



Between 2007 and 2011, the years for which detailed data is available, there were 2,795 patent applications by Kansas City inventors. Over that same time period there were 2,647 patents granted to inventors living in the Kansas City metropolitan area. Each of these patents may be relevant to many different industrial categories. When patents granted in the Kansas City area are counted by the individual categories pertinent to each patent, there were 6,585 patents granted between 2007 and 2011.

⁵ The Kansas City metropolitan area consists of Franklin County, Johnson County, Leavenworth County, Linn County, Miami County, and Wyandotte County in Kansas; and Bates County, Caldwell County, Cass County, Clay County, Clinton County, Jackson County, Lafayette County, Platte County, and Ray County in Missouri.

The vast majority of these patents were privately funded. Although there were patents granted to universities in resins, biotechnology, organic compounds, miscellaneous medical, and optics. There was only one patent granted to a Kansas City inventor directly funded by the federal government. Patents funded by the U.S. government tend to be of especially high quality.⁶ This particular patent was in the field of biotechnology.

Kansas City Patents Granted by Category
2007-2011

	Patents Granted	Share of Total MSA Patents	Share of National Patents in Category
Communications	2,141	32.5%	1.6%
Computer Software	884	13.4%	0.7%
Computer Hardware & Peripherals	387	5.9%	0.4%
Measuring & Testing	284	4.3%	0.8%
Data Processing	188	2.9%	0.4%
Surgery & Medical Instruments	180	2.7%	0.3%
Furniture, House Fixtures & Home Cleaning Appliances	143	2.2%	0.7%
Biotechnology	142	2.2%	0.1%
Other-Structures/Structural	126	1.9%	1.0%
Receptacles	124	1.9%	0.6%

Source: Strumsky Patent Database, The Brookings Institution

Between 2007 and 2011, communications patents accounted for more patents filed by inventors in the Kansas City area than any other patent category. The communications patent activity in Kansas City is primarily driven by Sprint Nextel Corporation and its affiliates. However, in 2011 there were also communications patents granted and assigned to Embarq Holdings, Garmin Switzerland, Honeywell International and Clear Wireless.

There is also a high level of patent activity in computer software and related categories in the Kansas City area. Computer related patents can apply to a wide range of industries. Cerner Innovations, a company that specializes in health care solutions, was assigned 31 patents in the computer software category in 2011. HNTB Holdings Ltd., which provides architectural, engineering, planning and construction services, was assigned eight patents in the computer software category in 2011.

⁶ Rothwell, Jonathan, Jose Lobo, Deborah Strumsky, and Mark Muro (2013). [Patenting Prosperity: Invention and Economic Performance in the United States and its Metropolitan Areas](#). The Brookings Institution Metropolitan Policy Program

Kansas City Patent Assignment
2011

Patents Granted*	Owner	Patent Class**
222	Sprint Communications Company LP	Telecommunications
143	Sprint Spectrum LP	Telecommunications
41	Embarq Holdings Company LLC	Multiplex communications
31	Cerner Innovations Inc.	Data processing: financial, business practice, management, or cost/price determination
22	Garmin Switzerland GMBH	Measuring, testing, or signalling instruments
10	Honeywell International Inc.	Telecommunications
10	BHA Group Inc.	Gas separation
10	General Electric Company	Data processing: measuring, calibrating, or testing
9	S C Johnson & Son Inc.	Packages and containers for goods
8	HNTB Holdings Ltd	Data processing: structural design, modeling, simulation, and emulation

Source: Strumsky Patent Database, The Brookings Institution

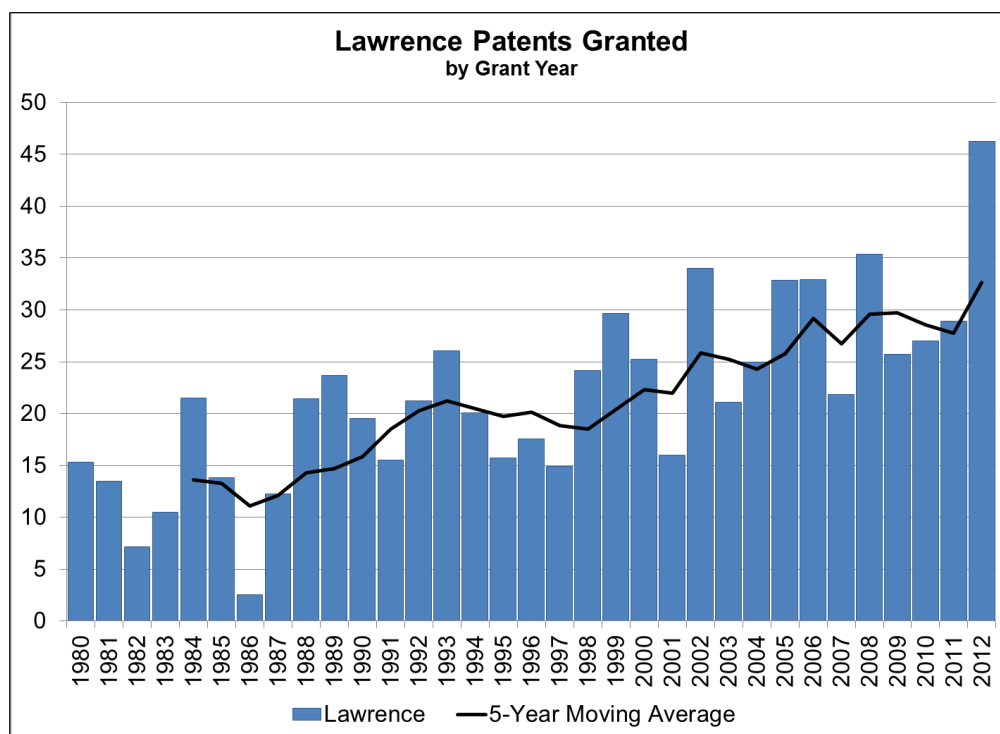
*Number of patents granted to owner in 2011 from inventors living in metropolitan area

**Owner's most common USPTO class of patents for inventors living in MSA

Lawrence

In recent years, the growth pattern of patent activity in the Lawrence metropolitan area has trended much differently than the national growth rate.⁷ In 2008, there were 35 patents granted to inventors living in the Lawrence area, the most for any year up to that point. There was a sharp decline in patent activity between 2008 and 2009, but then steady increases through 2012, when there were 46 patents granted to local inventors, a new high.

⁷ The Lawrence metropolitan area consists of Douglas County.



Between 2007 and 2011, the years for which detailed data is available, there were 180 patent applications by Lawrence inventors. Over that same time period there were 139 patents granted to inventors living in the Lawrence metropolitan area. The patent activity in the Lawrence area between 2007 and 2011 touched on 374 different categories of innovation.

The majority of these patents were privately funded, with no direct funding by federal government. Over this time period, there were university funded patents granted in biotechnology and organic compounds.

In addition to the university funded patents in biotechnology and organic compounds, there has been privately funded research in these categories in the Lawrence area. In 2011 there were patents granted and assigned in biotechnology to Hill’s Pet Nutrition, Inc., and Merck Sharp and Dohme Corporation, a subsidiary of Merck and Co., Inc., which conducts healthcare related research. In 2011 there were also patents granted and assigned in organic compounds to Deciphera Pharmaceuticals LLC, Cydex Pharmaceuticals Inc. and Pfizer Inc.

Between 2007 and 2011, 34 patents were granted to inventors living in the Lawrence area in the computer software category. A broad range of companies have inventors doing private research in computer software in the area. In 2011 there were patents granted and assigned to Garmin Switzerland and Rhythm Engineering in computer software related to vehicles, navigation and relative location. There were also patents granted and assigned to Repucom America LLC and Intervet International in financial software.

Lawrence Patents Granted by Category

2007-2011

	Patents Granted	Share of Total MSA Patents	Share of National Patents in Category
Biotechnology	63	16.8%	0.1%
Computer Software	34	9.1%	0.0%
Other-Structures/Structural	32	8.6%	0.2%
Communications	32	8.6%	0.0%
Organic Compounds	31	8.3%	0.1%
Measuring & Testing	27	7.2%	0.1%
Surgery & Medical Instruments	27	7.2%	0.0%
Transportation	15	4.0%	0.1%
Furniture, House Fixtures & Home Cleaning Appliances	12	3.2%	0.1%
Computer Hardware & Peripherals	9	2.4%	0.0%

Source: Strumsky Patent Database, The Brookings Institution

Lawrence Patent Assignment

2011

Patents Granted*	Owner	Patent Class**
8	Sprint Communications Company LP	Multiplex communications
5	Garmin Switzerland GMBH	Data processing: vehicles, navigation, and relative location
4	University Of Kansas	Organic compounds
3	Flint Hills Scientific LLC	Surgery
3	Hill's Pet Nutrition Inc.	Drug, bio-affecting and body treating compositions
3	Medtronics Inc.	Surgery
3	Conagra Foods Inc.	Packages and containers for goods
2	Rhythm Engineering LLC	Data processing: vehicles, navigation, and relative location
2	Mead Johnson Nutrition Company	Food or edible material: processes, compositions, and products
1	Deciphera Pharmaceuticals LLC	Organic compounds

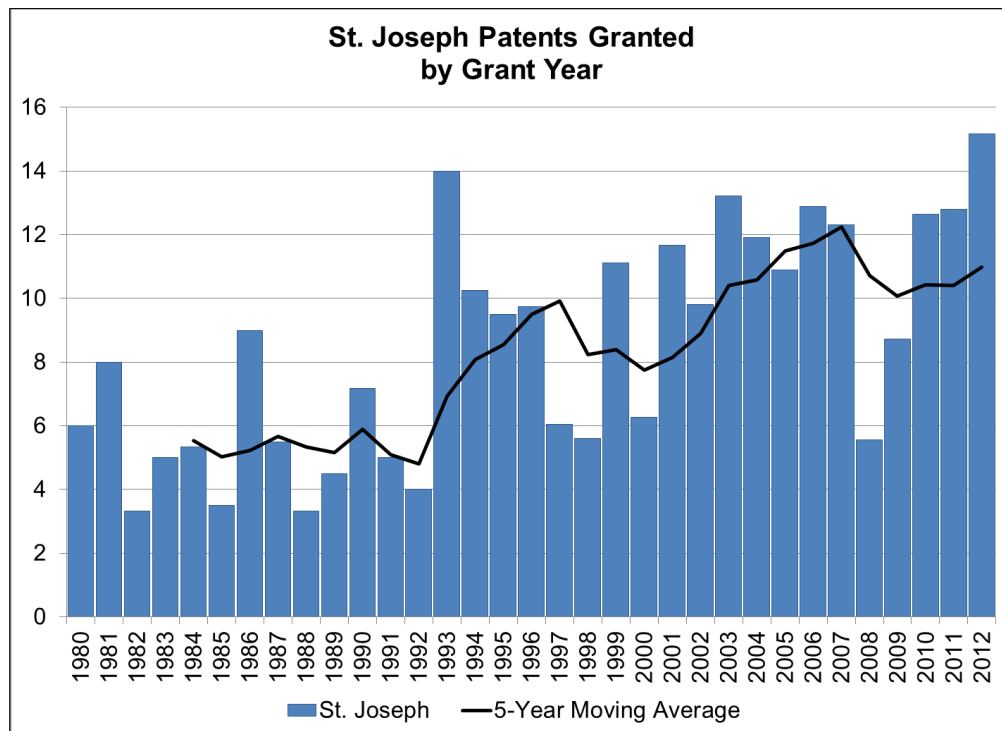
Source: Strumsky Patent Database, The Brookings Institution

*Number of patents granted to owner in 2011 from inventors living in metropolitan area

**Owner's most common USPTO class of patents for inventors living in MSA

St. Joseph

The St. Joseph metropolitan area has a low level of patent activity when compared to Kansas City and Wichita.⁸ The overall level of patenting activity has increased since the early 1990's, although it fell back to 1998 levels in 2008. There have been continuous increases since then.



Between 2007 and 2011, the years for which detailed data is available, there were 50 patent applications by St. Joseph inventors. Over that same time period there were 52 patents granted to inventors living in the St. Joseph metropolitan area. The patent activity in the St. Joseph area between 2007 and 2011 touched on 117 different subcategories of innovation.

The vast majority of these patents were privately funded. Over this time period, no patents were granted to inventors living in the St. Joseph metropolitan area that were directly funded by the federal government. There were university funded patents in biotechnology, chemical-purification, and evaporation and distillation.

In addition to the university funded patents in biotechnology, there have been biotechnology patents granted and assigned to private companies in 2011. Boehringer Ingelheim Vetmedica, Inc. and Intervet International, both specializing in animal health, received patents assigned from inventors living in the St. Joseph area in 2011.

⁸ The St. Joseph metropolitan area is comprised of Doniphan County, Kansas, and Andrew County, Buchanan County, and DeKalb County in Missouri.

St. Joseph Patents Granted by Category
2007-2011

	Patents Granted	Share of Total MSA Patents	Share of National Patents in Category
Biotechnology	17	14.5%	0.0%
Receptacles	13	11.1%	0.1%
Food Products & Apparatus	11	9.4%	0.1%
Transportation	11	9.4%	0.0%
Communications	9	7.7%	0.0%
Furniture, House Fixtures & Home Cleaning Appliances	7	6.0%	0.0%
Electrical Systems & Devices	7	6.0%	0.0%
Material Processing & Handling	6	5.1%	0.0%
Machine Element or Mechanism	5	4.3%	0.0%
Computer Software	5	4.3%	0.0%

Source: Strumsky Patent Database, The Brookings Institution

St. Joseph Patent Assignment
2011

Patents Granted*	Owner	Patent Class**
5	Boehringer Ingelheim Vetmedica Inc.	Chemistry: molecular biology and microbiology
4	Sprint Communications Company LP	Telephonic communications
2	Genego Inc.	Data processing: structural design, modeling, simulation, and emulation
2	Altec Industries Inc.	Fire escape, ladder, or scaffold
1	Reardon Machine Co., Inc.	Conveyors: power-driven
1	Ferno-Washington Inc.	Beds
1	Mars Inc.	Plastic and nonmetallic article shaping or treating: processes
1	Kansas Environmental Management Associates LLC	Liquid purification or separation
1	Kansas State University	Liquid purification or separation
1	Swan Valley Medical Incorporated	Surgery

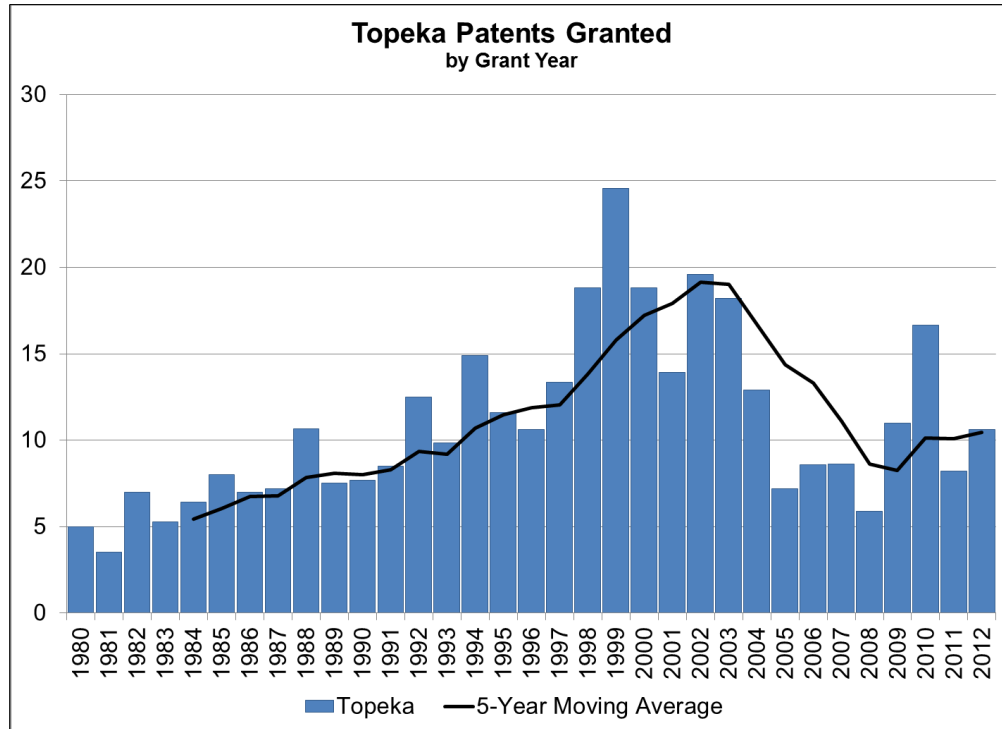
Source: Strumsky Patent Database, The Brookings Institution

*Number of patents granted to owner in 2011 from inventors living in metropolitan area

**Owner's most common USPTO class of patents for inventors living in MSA

Topeka

The Topeka metropolitan area has the lowest level of patenting activity of the Kansas metropolitan areas.⁹ The level of patenting activity in Topeka steadily declined from 2002 through 2008; however, this was following almost continual increases since 1980.



Between 2007 and 2011, the years for which detailed data is available, there were 40 patent applications by Topeka inventors. Over that same time period there were 50 patents granted to inventors living in the Topeka metropolitan area. The patent activity in the Topeka area between 2007 and 2011 touched on 117 different subcategories of innovation.

The vast majority of these patents were privately funded. Over this time period, no patents were granted to inventors living in the Topeka metropolitan area that were directly funded by the federal government. There were patents granted to universities in biotechnology and resins.

In addition to the university funded patents in biotechnology, there have been biotechnology patents granted and assigned to private companies in 2011. Hill's Pet Nutrition, Inc. received biotechnology patents assigned from inventors living in the Topeka area in 2011. Animal health has driven much of the biotechnology patent activity in the Topeka area.

Between 2007 and 2011 there were also a high number of apparel, textile and accessories patents filed in the Topeka area. In 2011 two patents in this category were granted and assigned to Payless Shoesource Worldwide, Inc. Although patents for shoes were filed in 2011, historically this is not typical

⁹ The Topeka metropolitan area consists of Jackson, Jefferson, Osage, Shawnee and Wabaunsee counties.

of the apparel, textile and accessories patents filed in the Topeka area. Patents granted in this subcategory to Topeka inventors cover a diverse range of the subcategories within apparel and textiles.

Topeka Patents Granted by Category
2007-2011

	Patents Granted	Share of Total MSA Patents	Share of National Patents in Category
Apparel, Textile & Accessories	23	19.7%	0.1%
Biotechnology	14	12.0%	0.0%
Computer Software	10	8.5%	0.0%
Power Systems	9	7.7%	0.0%
Receptacles	7	6.0%	0.0%
Food Products & Apparatus	5	4.3%	0.0%
Communications	5	4.3%	0.0%
Firearms, Ammunition & Explosives	4	3.4%	0.1%
Optics	4	3.4%	0.0%
Chemical-Physical Processes	3	2.6%	0.0%

Source: Strumsky Patent Database, The Brookings Institution

Topeka Patent Assignment
2011

Patents Granted*	Owner	Patent Class**
6	Hill's Pet Nutrition Inc.	Drug, bio-affecting and body treating compositions
2	Dornoch Medical Systems Inc.	Liquid purification or separation
2	Payless Shoesource Worldwide Inc.	Apparel and haberdashery
1	Nanoscale Corporation	Chemical apparatus and process disinfecting, deodorizing, preserving, or sterilizing
1	Caterpillar Inc.	Excavating
1	Hycrete Inc.	Compositions: coating or plastic
1	Hodgdon Powder Company Inc.	Explosive and thermic compositions or charges
1	Del Monte Corporation	Food or edible material: processes, compositions, and products
1	AT&T Corporation	Pulse or digital communications

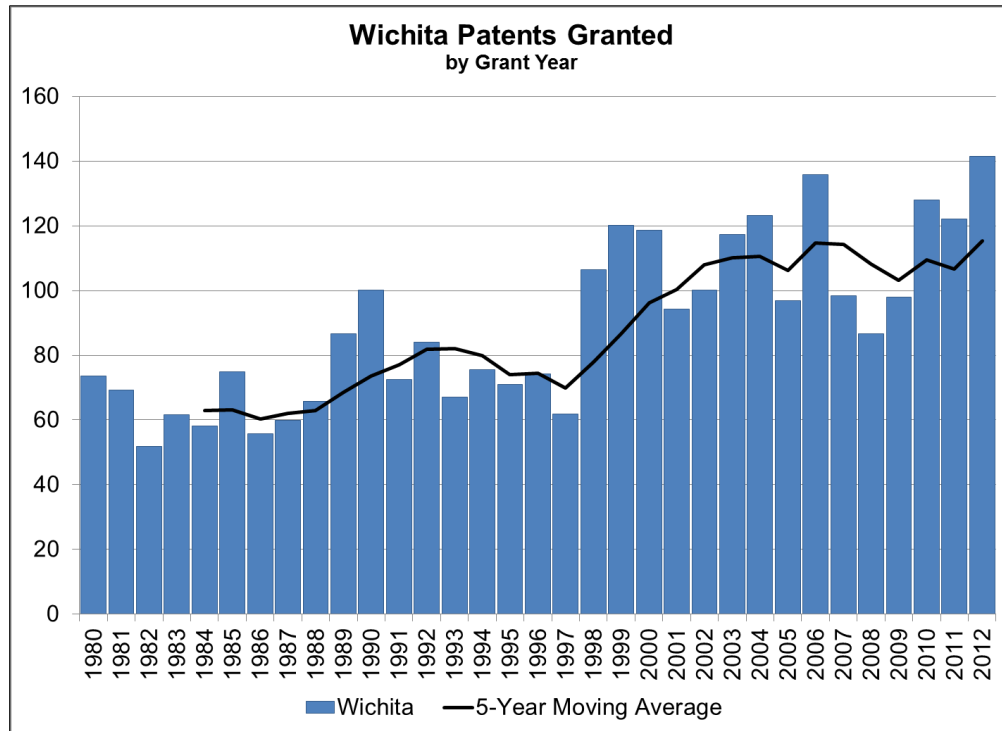
Source: Strumsky Patent Database, The Brookings Institution

*Number of patents granted to owner in 2011 from inventors living in metropolitan area

**Owner's most common USPTO class of patents for inventors living in MSA

Wichita

Since 1980 patenting activity in the Wichita metropolitan area has experienced periods of strong growth and moderate decline.¹⁰ Overall patenting activity has grown at an annualized rate of 2.0 percent over the past 32 years. After sharp declines in 2007 through 2009 the level of patenting has increased between 2011 and 2012 in the Wichita area.



Between 2007 and 2011, the years for which detailed data is available, there were 610 patent applications by Wichita inventors. Over that same time period there were 533 patents granted to inventors living in the Wichita metropolitan area. The patent activity in the Wichita area between 2007 and 2011 touched on 1,201 different subcategories of innovation.

The vast majority of these patents were privately funded. Over this time period no patents were granted to inventors living in the Wichita metropolitan area that were directly funded by the federal government. There were patents granted to universities in nuclear and X-rays, computer software, miscellaneous medical, metal working, miscellaneous other, and biotechnology.

The majority of the patents granted in the Wichita area between 2007 and 2011 were in agriculture and animal husbandry. In 2011, 25 patents were granted and assigned in this category to AGCO Corporation, a manufacturer of farm equipment. Between 2007 and 2011 AGCO has accounted for approximately 35 percent of the patents filed in the Wichita area in agriculture and animal husbandry.

There were also a high number of patents filed in the transportation category to inventors living in the Wichita area. However, many of the other categories with a high level of patent activity in the area may

¹⁰ The Wichita metropolitan area consists of Butler, Harvey, Sedgwick and Sumner counties.

also be attributed to research done by transportation companies. Many patents assigned in 2011 to Wichita transportation companies were outside of the transportation category. Cessna Aircraft Company received patents in data processing. Spirit Aerosystems, Inc. received patents in material processing, and The Boeing Company received patents in metal working.

Wichita Patents Granted by Category
2007-2011

	Patents Granted	Share of Total MSA Patents	Share of National Patents in Category
Agriculture & Animal Husbandry	116	9.7%	1.6%
Transportation	98	8.2%	0.3%
Computer Hardware & Peripherals	83	6.9%	0.1%
Food Products & Apparatus	77	6.4%	0.7%
Metal Working	60	5.0%	0.4%
Electrical Systems & Devices	52	4.3%	0.2%
Power Systems	47	3.9%	0.1%
Computer Software	46	3.8%	0.0%
Information Storage	44	3.7%	0.1%
Material Processing & Handling	43	3.6%	0.2%

Source: Strumsky Patent Database, The Brookings Institution

The category with the third highest level of patent activity in the Wichita area between 2007 and 2011 is computer hardware and peripherals. This has primarily been driven by patents granted and assigned to LSI Corporation. LSI has received assignments from Wichita area inventors in computer hardware and peripherals and electrical systems and devices.

Food products and apparatus has also been an area of fairly high patenting activity in Wichita between 2007 and 2011. Some of these patents were granted and assigned to Cargill, Inc. and its affiliates. Although Cargill has been active in patents in food products and apparatus, they have also been granted and assigned patents in communications, chemistry, and combustion.

Wichita Patent Assignment
2011

Patents Granted*	Owner	Patent Class**
27	LSI Corporation	Electrical computers and digital data processing systems: input/output
25	Agco Corporation	Harvesters
17	Boeing Company	Aeronautics and astronautics
11	Spirit Aerosystems Inc.	Aeronautics and astronautics
8	Vornado Air LLC	Environmental heating and cooling; fluid handling and sanitary equipment
7	DG Manufacturing LLC	Material or article handling equipment
6	Cargill Inc.	Food or edible material: processes, compositions, and products
5	Johnson Controls Inc.	Refrigeration
5	Netapp Inc.	Electrical computers and digital processing systems: multicomputer data transferring
4	The Coleman Company Inc.	Apparel and haberdashery

Source: Strumsky Patent Database, The Brookings Institution

*Number of patents granted to owner in 2011 from inventors living in metropolitan area

**Owner's most common USPTO class of patents for inventors living in MSA