



*Demonstrating the Importance of the  
Printing Industry to the South Dakota State and Local Governments*

# South Dakota Printing Industry Economic & Fiscal Contribution

*The printing industry in South Dakota contributes value to the state economy in many ways. The industry generates and supports many jobs, economic output, and government programs. The industry contributes over \$407 million in output, 2,290 jobs, \$90.8 million in labor income, and nearly \$6.6 million in state and local tax revenues.*

## The U.S. Printing Industry

America's commercial printing industry has a significant economic footprint. It employs almost 450,000 people in more than 25,000 establishments with annual shipments of over \$83 billion. It is one of America's oldest manufacturing industries having been established long before the founding of the United States. Today, it continues to evolve as a high-tech, innovative communication and advertising media and also includes non-media elements such as packaging and wrappers. It is also America's most geographically dispersed manufacturing industry with a significant presence in every state.

### Definition

For this report "printing" is defined as North American Industrial Classification System Code 323—Printing and Related Support Activities. This sector encompasses many segments: general commercial printing, quick printing, digital imaging, magazines, newspapers, book and display graphics, financial and legal printing, screen printing, forms printing, label and tag printing, packaging, greeting cards, and trade and finishing services.

Due to the rapid technological changes and broadening of the scope of services provided by many printing companies today, it is commonly referred to as the graphic communications industry.

Companies in the printing industry have expanded services to include creative design, retail display design, e-commerce, webpage design and hosting, mailing, fulfillment, and a host of other ancillary services that provide horizontal marketing well beyond the core printing model. This is a description that accurately represents the broad range of what printers do today.

### What is an Economic & Fiscal Contribution Study?

The aim of this study is to establish the economic importance of the printing industry to the South Dakota economy. We define "importance" as the total contribution to the regional economy in terms of shipments, employment, labor income, and value-added (GDP).

The results from our economic and fiscal contribution study will show the interconnectedness of the printing industry with the South Dakota economy. We will gain a clear understanding of how much economic activity

## The Economic Contribution Model

$$\begin{aligned} &\text{Direct Contribution} \\ &+ \\ &\text{Indirect Contribution} \\ &+ \\ &\text{Induced Contribution} \\ &= \\ &\text{Total Economic Contribution} \end{aligned}$$

is being cycled through the South Dakota economy due to the printing industry. We will also calculate how much economic activity was associated with the printing industry.

South Dakota print industry fiscal contributions include federal, state, and local taxes. We estimated these fiscal contributions using data from the PIA *Ratios* financial benchmarking database, Fiscal Year 2015 Analytical Perspectives Budget of the U.S. government from the Office of Management and Budget (OMB), and the Tax Foundation. See *Appendix for definitions*.

### Economic Contributions

In 2015, the printing industry directly contributed \$262.4 million in output, 1,410 jobs, and \$57.2 million in labor income to the South Dakota economy. After calculating backward-linked supply chain effects (i.e., indirect economic contributions) and household spending generated by labor income by labor income (i.e., induced economic contributions), these values increased significantly. Total economic contributions to the South Dakota economy amounted to \$407.3 million in output, \$179.0 million in value-added (GDP), 2,290 jobs, and \$90.8 million in labor income.

Backward-linked supply chain effects or indirect contributions accounted for 17.5% or \$71.4 million of total economic contributions, 17% of employment contributions or 389 jobs, and 18.3% of labor income contributions or \$16.6 million. Household spending generated by labor income or induced economic contributions accounted for \$73.5 million or 18% of total economic contributions, 21.4% of employment contributions or 490 jobs, and 18.7% of labor income contributions or \$17.0 million.

The printing industry in South Dakota generates \$179.0 million in value-added (GDP) annually through its

## PRINTING INDUSTRY ECONOMIC CONTRIBUTION IN SOUTH DAKOTA

	Direct Contribution	Indirect Contribution	Induced Contribution	Total Economic Contribution
Output (\$1,000s)	\$262,400.9	\$71,373.0	\$73,498.5	<b>\$407,272.4</b>
Employment	1,410	389	490	<b>2,290</b>
Labor Income (\$1,000s)	\$57,203.2	\$16,594.7	\$17,029.4	<b>\$90,827.3</b>
Value-Added (GDP) (\$1,000s)	\$123,328.4	\$2,921.4	\$44,450.7	<b>\$179,009.9</b>

Source: RIMS II multipliers and Census Bureau County Business Patterns Database

Figure 1

direct economic impact and indirect/induced effects or approximately 0.38% of the state’s \$47.1 billion total economic output. Compared to the overall national figures, the North Dakota printing industry drives a smaller percentage of GDP than other states. The national average is 0.49% of GDP.

For every additional \$1 in output, the printing industry generates an additional \$0.55 in backward-linked, non-printing industry spending and household spending. To break that down further, every additional \$1 of output generated by the printing industry leads to an additional \$0.27 in backward-linked industries and \$0.28 in additional household spending.

In South Dakota, the backward-linked industries the printing industry has the strongest relationship with include manufacturing, wholesale trade, finance and insurance, transportation and warehousing, and administrative and waste management services. The industries most affected by induced household spending generated by the printing industry include health care and social assistance, real estate, rental and leasing; retail trade; finance and insurance; and manufacturing. The combined industries most affected by backward-linked and induced household spending are shown in Figure 2.

Every additional job in the South Dakota printing industry supports an additional 0.62 non-print jobs, inter-industry effects support 0.28 jobs, and additional household spending 0.35 jobs. The printing industry

has a strong inter-industry relationship with other manufacturers—54.1% of print’s inter-industry effect is with other manufacturing industries.

Induced employment contributions are based on additional household spending cycling through the economy. The sectors of the South Dakota economy that are most affected by the induced employment contribution include health care and social assistance, retail trade, and food services and drinking places. Each job directly generated by the printing industry results in 0.35 being supported through induced employment contributions. The induced jobs are lower-paying on average because they are in industries with lower wages on average.

The industries that are most interconnected to the printing industry through the combination of indirect and induced employment contribution include: manufacturing, health care and social assistance, retail trade, food services and drinking places, and administrative and waste management services (Figure 3).

The South Dakota economy generated nearly \$47.1 billion of gross domestic product (GDP) in 2015 or approximately 0.26% of total U.S. output and 6.55% of PIM total output.

The largest industries in terms of percentage of GDP in the South Dakota economy are finance and insurance (14.4%); manufacturing (9.6%); real estate, rental and leasing (9.3%); health care and social assistance (8.5%);

## INDUSTRIES MOST INTERCONNECTED WITH THE PRINTING INDUSTRY IN SOUTH DAKOTA

(Percent of Indirect and Induced Output Generated by Print Economic Activity)

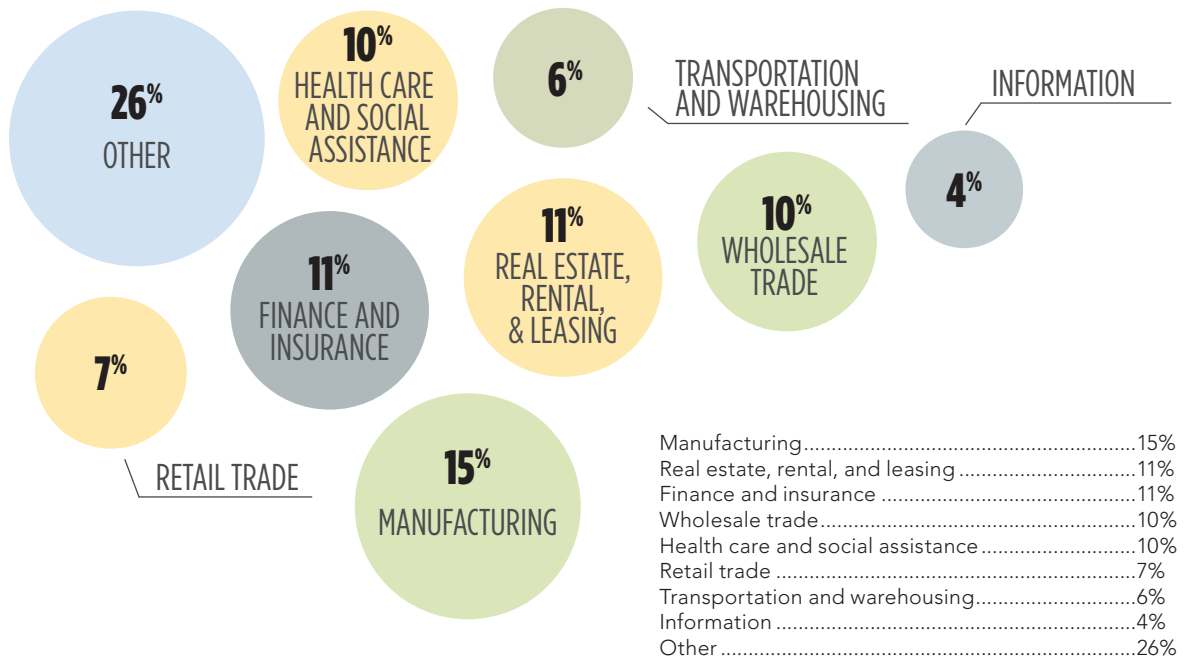


Figure 2

## INDUSTRIES MOST INTERCONNECTED WITH THE PRINTING INDUSTRY IN SOUTH DAKOTA

(Percent of Indirect and Induced Employment Generated by Print Economic Activity)

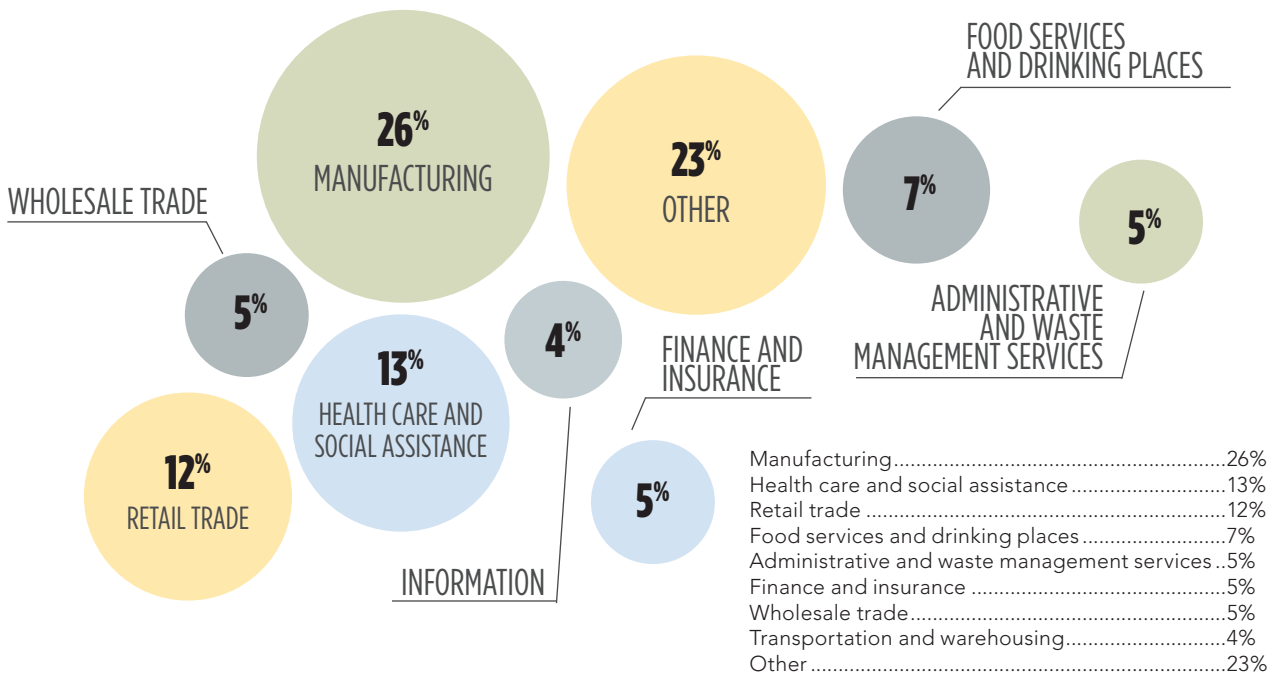


Figure 3

## GROSS DOMESTIC PRODUCT BY INDUSTRY IN SOUTH DAKOTA

(millions of current dollars)

Industry	GDP (millions of current dollars)		Percent Change 2014 to 2015	Share of Growth	Contribution to Change in Output	Percent Share of State Output	
	2014	2015				2014	2015
Finance and insurance	6,584	6,801	3.3%	13.6%	0.5%	14.5%	14.4%
Manufacturing	4,201	4,497	7.0%	18.4%	0.6%	9.2%	9.6%
Real estate, rental and leasing	4,150	4,370	5.3%	13.7%	0.5%	9.1%	9.3%
Health care and social assistance	3,918	4,176	6.6%	16.1%	0.6%	8.6%	8.9%
Agriculture, forestry, fishing, and hunting	4,200	3,720	-11.4%	-29.9%	-1.1%	9.2%	7.9%
Retail trade	3,397	3,528	3.9%	8.2%	0.3%	7.5%	7.5%
Wholesale trade	3,257	3,414	4.8%	9.8%	0.3%	7.2%	7.3%
Construction	1,821	1,985	9.0%	10.2%	0.4%	4.0%	4.2%
Professional, scientific, and technical services	1,358	1,519	11.8%	10.0%	0.4%	3.0%	3.2%
Accommodation and food services	1,376	1,463	6.3%	5.4%	0.2%	3.0%	3.1%
Information	1,100	1,192	8.4%	5.8%	0.2%	2.4%	2.5%
Transportation and warehousing	1,090	1,128	3.6%	2.4%	0.1%	2.4%	2.4%
Other services, except government	957	1,014	6.0%	3.6%	0.1%	2.1%	2.2%
Utilities	803	763	-4.9%	-2.4%	-0.1%	1.8%	1.6%
Administrative and waste management services	705	744	5.4%	2.4%	0.1%	1.6%	1.6%
Management of companies and enterprises	576	631	9.6%	3.4%	0.1%	1.3%	1.3%
Arts, entertainment, and recreation	273	286	4.8%	0.8%	0.0%	0.6%	0.6%
Educational services	280	286	2.1%	0.4%	0.0%	0.6%	0.6%
Mining	177	174	-1.8%	-0.2%	0.0%	0.4%	0.4%
Government	5,250	5,385	2.6%	8.4%	0.3%	11.5%	11.4%
<b>All industry total</b>	<b>45,469</b>	<b>47,074</b>	<b>3.5%</b>	<b>100.0%</b>	<b>3.5%</b>	<b>100.0%</b>	<b>100.0%</b>

Figure 4

and agriculture, forestry, fishing, and hunting (7.9%). We do not include government in the list above (11.4% of output) because it is considered a final use of GDP in the input-output models.

As you can see in the “Share of Growth” and “Percent Contribution to Change in Output” columns in the table above, the industries that are driving the most growth in 2015 include manufacturing (increased 7.0% adding 0.6% to total South Dakota output or 18.4% share of growth); health care and social assistance (increased 6.6% adding 0.6% to total output or 16.4% share of growth); and real estate and rental and leasing (increased 5.3% adding 0.5% to total output or 13.7%

share of growth). See table above for the complete breakdown by industry.

The size of the industry in the region has an effect on the indirect and induced impact the printing industry has on the regional economy. In other words, on average, the larger the industry the more inter-related it is with various industries within a region. This trend has held constant for Iowa, Minnesota, Nebraska, and South Dakota. On average, the largest industries are more inter-related to the printing industry both in terms of backward-linked supply chain effects and additional household spending generated from printing industry labor incomes.

## SIZE OF SOUTH DAKOTA INDUSTRIES COMPARED TO INDUSTRIES' INDIRECT AND INDUCED RELATIONSHIP WITH THE PRINTING INDUSTRY

Industry	Rank		Percent of	
	By Size of Industry (\$ Output)	By Interconnectedness with the Printing Industry	Total Iowa Regional GDP	Printing Industry Indirect and Induced Output
Finance and insurance	1	3	14.4%	10.6%
Manufacturing	2	1	9.6%	15.3%
Real estate, rental and leasing	3	2	9.3%	11.0%
Health care and social assistance	4	5	8.9%	9.7%
Agriculture, forestry, fishing, and hunting	5	16	7.9%	1.4%
Retail trade	6	6	7.5%	7.0%
Wholesale trade	7	4	7.3%	10.4%
Construction	8	15	4.2%	1.7%
Professional, scientific, and technical services	9	9	3.2%	3.6%
Accommodation and food services	10	14	3.1%	5.0%
Information	11	8	2.5%	3.7%
Transportation and warehousing	12	7	2.4%	5.5%
Other services, except government	13	12	2.2%	3.3%
Utilities	14	11	1.6%	3.4%
Administrative and waste management services	15	10	1.6%	3.5%
Management of companies and enterprises	16	13	1.3%	3.2%
Arts, entertainment, and recreation	17	18	0.6%	0.7%
Educational services	18	17	0.6%	0.9%
Mining	19	19	0.4%	0.1%

Figure 5

For example, finance and insurance accounts for 14.4% of total economic output in South Dakota in South Dakota (it is the largest industry), and 10.6% of the printing industry's indirect and induced contributions to the regional economy are circulated through this industry.

Manufacturing and real estate, rental and leasing are the two most inter-related industries with the printing industry and are the second and third largest industries respectively in South Dakota. See the chart above for the complete list of industry output as a percent of total regional output compared to indirect and induced printing industry economic contributions by industry (Figure 5).

### Fiscal Contributions

Federal, state, and local tax revenues generated by the South Dakota printing industry totaled \$29.13 million. The printing industry added \$123.33 million in direct value-added output to South Dakota's gross domestic product and 23.6% of this output was collected by the federal, state, and local governments in taxes. The main sources of federal tax revenues were individual income taxes and social security taxes. South Dakota's printing industry revenues generated \$6.55 million in revenue for the state and local governments. Property taxes (48.8% of state and local collections) and general sales/use taxes (32.1%) were the two main sources of revenue for state and local governments. South Dakota levies no individual income or corporate income tax according to the Tax Foundation (Figure 6).

### Conclusions

The printing industry in South Dakota is a large and moderately interconnected industry. Each additional dollar generated by the printing industry in South Dakota leads to an additional \$0.55 in backward-linked supply chain spending and additional household spending. Each print job supports 0.62 jobs in the South Dakota labor market due to spending of labor income in the backward-linked supply chain industries and household spending. Print industry output in South Dakota is most interconnected with manufacturing; real estate, rental and leasing; finance and insurance; wholesale trade; and health care and social assistance. Print industry employment in South Dakota is most interconnected with the following industries: manufacturing, health care and social assistance, and retail trade. The effects of an industry on the local economy add to total output, employment, wages, and also support of government

## 2015 FEDERAL, STATE, AND LOCAL TAXES GENERATED BY THE PRINTING INDUSTRY IN SOUTH DAKOTA

Type of Tax	Taxes Collected (\$ Millions)
<b>Federal Taxes</b>	
Individual income tax	\$10.38
Corporate income tax	\$3.04
Social security taxes	\$7.15
Excise taxes	\$0.75
Other taxes	\$1.26
<b>Total Federal Taxes</b>	<b>\$22.57</b>

Type of Tax	Taxes Collected (\$ Millions)
<b>State and Local Taxes</b>	
Individual income tax	\$0.00
Corporate income tax	\$0.00
Sales or use tax	\$2.10
Excise taxes	\$0.67
Property taxes	\$3.20
Other taxes	\$0.38
License taxes	\$0.38
<b>Total State and Local Taxes</b>	<b>\$6.55</b>
<b>Total Fiscal Contribution</b>	<b>\$29.13</b>

Sources: U.S. Census, Office of Management and Budget, and Tax Foundation Figure 6

programs. In South Dakota 5.3% of the printing industry's \$123.33 million in value-added output went to support state and local governments. Data used in this study are based on many sources, including BEA RIMS II multipliers, the Tax Foundation, County Business Patterns Database, PIA *Print Market Atlas*, and the PIA *Ratios* financial database for the printing industry.

## Definitions

### *Direct Contribution or Final-Demand Industry:*

The "Direct" contribution relates to the first round of inputs purchased from the final-demand industry or the figure we calculate in the *Print Market Atlas*. It is the portion of print shipments that are purchased for consumption by the final user. It includes the consumption of the goods and services that are produced and distributed in the economy. In the input-output accounts, final-use transactions consist of transactions that make up the final-expenditure components of GDP: personal consumption expenditures, private fixed investment, change in private inventories, exports of goods and services, imports of goods and services, federal, state, and local government consumption expenditures, and gross investment.

*Indirect Contribution:* Relates to the subsequent rounds of inputs purchased by supporting industries. Some of the supporting industries include: mining, utilities, construction, manufacturing, wholesale trade, retail trade, information, educational services, healthcare and social services, arts, entertainment, and recreation, etc. The sum of the "direct" and "indirect" contributions is called the inter-industry effect or inter-industry total. This takes into account the spending the printing industry generates in other industries—the impact of local industries buying goods and services from other local industries. The cycle of spending works its way backward through the supply chain until all money leaks from the local economy, either through imports or by payments to value-added.

*Induced Contributions:* RIMS Type II multipliers not only account for the inter-industry effect but also account for the induced economic contribution to final-demand. The induced contribution relates to spending of workers whose earnings or labor income are affected by the final demand contribution. This contribution is called the household-spending contribution. We use the multipliers to measure the total contribution to the state economy.

*Total Economic Contribution:* Includes the final demand generated by the printing industry, the inter-industry contributions or indirect effects, and the induced contribution from household spending that the printing industry supports.



*For more information on how Input-Output multipliers are developed by the Bureau of Economic Analysis (BEA) we recommend reading the RIMS II handbook, "An essential tool for regional developers and planners."*





*Printing Industry Midwest Economic and Fiscal Contribution Report*  
*Commissioned by Printing Industry Midwest*

**Published by Printing Industries of America's Center for Print Economics and Management.**

**Authors:** Dr. Ronnie H. Davis, Senior Vice President & Chief Economist  
Tai McNaughton, Economist

