



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

# Minnesota Printing Industry Economic & Fiscal Contribution

*The printing industry in Minnesota contributes value to the state economy in many ways. The industry generates and supports many jobs, economic output, and government programs. The industry contributes almost \$10 billion in output, 57,069 jobs, \$2.6 billion in labor income, and more than \$183 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 Minnesota 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 Minnesota economy. We will gain a clear understanding of how much economic activity is

## The Economic Contribution Model

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

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

Minnesota 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 \$4.4 billion in output, 23,548 jobs, and \$1.2 billion in labor income to Minnesota's 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 for the Minnesota economy amounted to almost \$10 billion in output, \$4.7 billion in value-added (GDP), 57,069 jobs, and \$2.6 billion in labor income.

Backward-linked supply chain effects or indirect contributions accounted for 30.4% or \$3.0 billion of total economic contributions, 25.9% of employment contributions or 14,800 jobs, and 29.7% of labor income contributions or \$775.9 million. Household spending generated by labor income or induced economic contributions accounted for \$2.55 billion or 25.6% of total economic contributions, 32.8% of employment contributions or 18,721 jobs, and 26.1% of labor income contributions or \$683.9 million.

The printing industry in Minnesota generates \$4.7 billion in value-added (GDP) annually through its

## PRINTING INDUSTRY ECONOMIC CONTRIBUTION IN MINNESOTA

|                              | Direct Contribution | Indirect Contribution | Induced Contribution | Total Economic Contribution |
|------------------------------|---------------------|-----------------------|----------------------|-----------------------------|
| Output (\$1,000s)            | \$4,382,281.3       | \$3,030,347.5         | \$2,552,240.6        | <b>\$9,964,869.4</b>        |
| Employment                   | 23,548              | 14,800                | 18,721               | <b>57,069</b>               |
| Labor Income (\$1,000s)      | \$1,155,873.6       | \$775,937.9           | \$683,930.4          | <b>\$2,615,741.9</b>        |
| Value-Added (GDP) (\$1,000s) | \$2,059,672.2       | \$915,223.1           | \$1,503,998.9        | <b>\$4,655,735.6</b>        |

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

Figure 1

direct economic impact and indirect/induced effects or approximately 1.43% of the state's \$326.8 billion total economic output. Compared to the overall national figures, the Minnesota printing industry drives a slightly larger percent of GDP than other states. The national average is 0.49% of GDP.

The printing industry has a strong relationship with other sectors of the economy in Minnesota, leading to significant multipliers. For every additional \$1 in output, the printing industry generates an additional \$1.27 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 \$0.69 in backward-linked industries and \$0.58 in additional household spending.

In Minnesota, the backward-linked industries the printing industry has the strongest relationship with include manufacturing; wholesale trade; professional, scientific, and technical services; real estate, rental, and leasing; and finance and insurance. The industries most affected by induced household spending generated by the printing industry include: real estate, rental, and leasing; health care and social assistance; finance and insurance; and manufacturing. The combined industries most affected by backward-linked and induced household spending include manufacturing, real estate, rental and leasing, finance and insurance, and wholesale trade (Figure 2).

Every additional job in the Minnesota printing industry supports an additional 1.42 non-print jobs due to inter-industry effects and additional household spending. The

printing industry has a strong inter-industry relationship with other manufacturers—33.3% of print's inter-industry effect is with other manufacturing industries. Since, on average, manufacturing pays higher average salaries than the service sector, the labor income per additional job is high.

Induced employment contributions are based on additional household spending cycling through the economy. The sectors of the Minnesota economy that are most affected by induced employment contributions include health care and social assistance (18.5%); retail trade (16.0%); and real estate, rental, and leasing (10.9%). Each job directly generated by the printing industry results in 0.80 being supported through induced employment contributions. 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; administrative and waste management services; and real estate, rental and leasing (Figure 3).

The Minnesota economy generated \$326.8 billion of gross domestic product (GDP) in 2015 or approximately 1.82% of total U.S. output and 45.5% of PIM total output. The largest industries in terms of percent of GDP in Minnesota are manufacturing (14.8%); real estate, rental, and leasing (11.7%); health care and social assistance (9.2%); finance and insurance (7.8%); and wholesale trade (6.9%). We do not include government in the list above (10.0% of output) because it is considered a final use of GDP in the input-output models. The industries that are

## INDUSTRIES MOST INTERCONNECTED WITH THE PRINTING INDUSTRY IN MINNESOTA (Percent of Indirect and Induced Output Generated by Print Economic Activity)

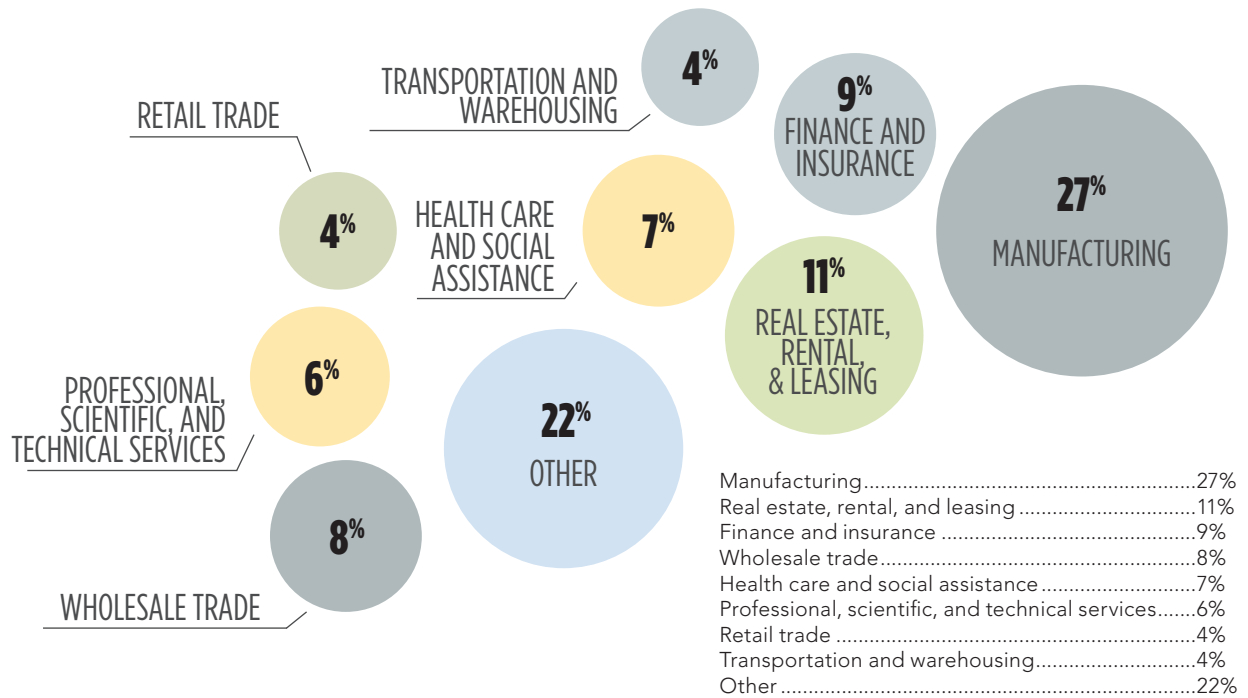


Figure 2

## INDUSTRIES MOST INTERCONNECTED WITH THE PRINTING INDUSTRY IN MINNESOTA (Percent of Indirect and Induced Employment Generated by Print Economic Activity)



Figure 3

## GROSS DOMESTIC PRODUCT BY INDUSTRY IN MINNESOTA

(millions of current dollars)

| Industry   | GDP<br>(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          |
| Manufacturing                                    | 46,942                               | 48,236         | 2.8%                        | 13.1%           | 0.4%                             | 14.8%                         | 14.8%         |
| Real estate, rental, and leasing                 | 37,045                               | 38,400         | 3.7%                        | 13.7%           | 0.4%                             | 11.7%                         | 11.7%         |
| Health care and social assistance                | 28,331                               | 29,937         | 5.7%                        | 16.3%           | 0.5%                             | 8.9%                          | 9.2%          |
| Finance and insurance                            | 25,696                               | 25,559         | -0.5%                       | -1.4%           | 0.0%                             | 8.1%                          | 7.8%          |
| Wholesale trade                                  | 21,956                               | 22,559         | 2.7%                        | 6.1%            | 0.2%                             | 6.9%                          | 6.9%          |
| Professional, scientific, and technical services | 19,311                               | 20,503         | 6.2%                        | 12.1%           | 0.4%                             | 6.1%                          | 6.3%          |
| Retail trade                                     | 17,510                               | 18,286         | 4.4%                        | 7.9%            | 0.2%                             | 5.5%                          | 5.6%          |
| Construction                                     | 12,270                               | 13,432         | 9.5%                        | 11.8%           | 0.4%                             | 3.9%                          | 4.1%          |
| Management of companies and enterprises          | 12,281                               | 12,644         | 3.0%                        | 3.7%            | 0.1%                             | 3.9%                          | 3.9%          |
| Information                                      | 11,107                               | 11,591         | 4.4%                        | 4.9%            | 0.2%                             | 3.5%                          | 3.5%          |
| Transportation and warehousing                   | 9,184                                | 9,695          | 5.6%                        | 5.2%            | 0.2%                             | 2.9%                          | 3.0%          |
| Administrative and waste management services     | 7,730                                | 8,238          | 6.6%                        | 5.1%            | 0.2%                             | 2.4%                          | 2.5%          |
| Accommodation and food services                  | 7,069                                | 7,572          | 7.1%                        | 5.1%            | 0.2%                             | 2.2%                          | 2.3%          |
| Other services, except government                | 6,716                                | 7,027          | 4.6%                        | 3.2%            | 0.1%                             | 2.1%                          | 2.2%          |
| Agriculture, forestry, fishing, and hunting      | 7,235                                | 6,260          | -13.5%                      | -9.9%           | -0.3%                            | 2.3%                          | 1.9%          |
| Utilities  | 5,529                                | 5,328          | -3.6%                       | -2.0%           | -0.1%                            | 1.7%                          | 1.6%          |
| Educational services                             | 3,003                                | 3,040          | 1.2%                        | 0.4%            | 0.0%                             | 0.9%                          | 0.9%          |
| Arts, entertainment, and recreation              | 2,694                                | 2,940          | 9.1%                        | 2.5%            | 0.1%                             | 0.8%                          | 0.9%          |
| Mining   | 3,603                                | 2,812          | -21.9%                      | -8.0%           | -0.2%                            | 1.1%                          | 0.9%          |
| Government                                       | 31,761                               | 32,777         | 3.2%                        | 10.3%           | 0.3%                             | 10.0%                         | 10.0%         |
| <b>All industry total</b>                        | <b>316,973</b>                       | <b>326,833</b> | <b>3.1%</b>                 | <b>100.0%</b>   | <b>3.1%</b>                      | <b>100.0%</b>                 | <b>100.0%</b> |

Figure 4

driving the most growth in 2015 include healthcare and social assistance (increased 5.7% adding 0.5% to total Minnesota output or 16.3% share of growth); real estate, rental, and leasing (increased 3.7% adding 0.4% to total output or 13.7% share of growth); and manufacturing (increased 2.8% adding 0.4% to total output or 13.1% share of growth). 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 interconnected it is with various industries within a region.

For example, manufacturing accounts for 14.8% of total economic output in Minnesota and it is the largest

industry. Over 27% of the printing industry’s indirect and induced contributions to the regional economy are circulated through the manufacturing industry. In fact, the seven largest industries in Minnesota are also the highest ranked in terms of percent of printing industry indirect and induced contribution to the regional economy. There is some variation in the top seven industries; for example, healthcare and social assistance is the third largest industry in Minnesota but the fifth largest in terms of indirect and induced output generated via print contributions. See the figure 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).

## SIZE OF MINNESOTA 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 |
| Manufacturing                                    | 1                               | 1  | 14.8%                   | 27.2%   |
| Real estate, rental, and leasing                 | 2                               | 2  | 11.7%                   | 11.3%   |
| Health care and social assistance                | 3                               | 5  | 10.0%                   | 6.6%  |
| Finance and insurance                            | 4                               | 3  | 9.2%                    | 9.2%  |
| Wholesale trade                                  | 5                               | 4  | 7.8%                    | 8.2%  |
| Professional, scientific, and technical services | 6                               | 6  | 6.9%                    | 6.2%  |
| Retail trade                                     | 7                               | 7  | 6.3%                    | 4.4%  |
| Construction                                     | 8                               | 16   | 5.6%                    | 0.9%  |
| Management of companies and enterprises          | 9                               | 9  | 4.1%                    | 3.7%  |
| Information                                      | 10                              | 10   | 3.9%                    | 3.5%  |
| Transportation and warehousing                   | 11                              | 8  | 3.5%                    | 4.4%  |
| Administrative and waste management services     | 12                              | 11   | 3.0%                    | 3.4%  |
| Accommodation and food services                  | 13                              | 12   | 2.5%                    | 3.1%  |
| Other services, except government                | 14                              | 14   | 2.3%                    | 2.5%  |
| Agriculture, forestry, fishing, and hunting      | 15                              | 15   | 2.2%                    | 1.2%  |
| Utilities  | 16                              | 13   | 1.9%                    | 2.5%  |
| Educational services                             | 17                              | 17   | 1.6%                    | 0.8%  |
| Arts, entertainment, and recreation              | 18                              | 18   | 0.9%                    | 0.8%  |
| Mining   | 19                              | 19   | 0.9%                    | 0.1%  |

Figure 5

## Fiscal Contributions

Federal, state, and local tax revenues generated by the Minnesota printing industry totaled over \$560 million. The printing industry added \$2.1 billion in direct value-added output to Minnesota's gross domestic product, and 27.2% 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 (46%) and social security taxes (34%). Almost 9% of Minnesota's printing industry revenues or \$183.36 million were collected to help fund the state and local governments. Individual income taxes (34%) and property taxes (33%) were the two main sources of revenue for state and local governments. (Figure 6).

## Conclusions

The printing industry in Minnesota is large and a significantly interconnected industry. Each additional dollar generated by the printing industry in Minnesota leads to an additional \$1.27 in backward-linked supply chain spending and additional household spending. Each print job supports 1.42 jobs in the Minnesota labor market due to spending of labor income in the backward-linked supply chain industries and household spending. Print industry output in Minnesota is most interconnected with other manufacturers, real estate, rental and leasing, and finance and insurance. Print industry employment in Minnesota 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 programs. In Minnesota, almost 9% of the printing industry's \$2.1 billion 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.

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

| Type of Tax                | Taxes Collected (\$ Millions) |
|----------------------------|-------------------------------|
| <b>Federal Taxes</b>       |                               |
| Individual income tax      | \$173.38                      |
| Corporate income tax       | \$50.75                       |
| Social security taxes      | \$119.33                      |
| Excise taxes               | \$12.49                       |
| Other taxes                | \$21.04                       |
| <b>Total Federal Taxes</b> | <b>\$376.99</b>               |

| Type of Tax                        | Taxes Collected (\$ Millions) |
|------------------------------------|-------------------------------|
| <b>State and Local Taxes</b>       |                               |
| Individual income tax              | \$65.51                       |
| Corporate income tax               | \$8.59                        |
| Sales or use tax                   | \$24.33                       |
| Excise taxes                       | \$19.24                       |
| Property taxes                     | \$56.01                       |
| Other taxes                        | \$6.27                        |
| License taxes                      | \$6.27                        |
| <b>Total State and Local Taxes</b> | <b>\$183.36</b>               |
| <b>Total Fiscal Contribution</b>   | <b>\$560.36</b>               |

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



## 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.”*





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