



ECONOMIC CONTRIBUTION REPORT

ABSTRACT

The following report showcases the total economic contribution that the printing industry adds to the five-state Printing Industry Midwest Region of Iowa, Minnesota, Nebraska, North Dakota, and South Dakota in terms of shipments, employment, labor income, and GDP.

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Commissioned by Printing Industry Midwest

Published by Printing Industries of America's Center for Economics & Market Research.

Table of Contents

1. Executive Summary	4
2. Introduction	6
3. Current Printing Industry Conditions	8
4. The Printing Industry Defined.....	10
5. PIM Printing Industry Economic and Fiscal Contribution Model.....	12
6. Economic Structure of the PIM Regional Economy.....	16
Printing Industry Economic and Fiscal Contributions:	
7. PIM Five-State Region.....	24
8. Iowa.....	31
9. Minnesota	39
10. Nebraska	47
11. North Dakota	55
12. South Dakota	63
13. Sources.....	77

Executive Summary

The 2013 Printing Industry Midwest Economic Contribution Report was developed by Printing Industries of America's Center for Print Economic and Market Research based on data from the Bureau of Economic Analysis (BEA), Census Bureau, and the PIA model of the printing industry. The year 2013 is used due to lags in collecting and reporting U.S. government data. We used the BEA RIMS I and RIMS II multipliers to determine Indirect and Induced economic impacts the printing industry has on the Printing Industry Midwest five-state region of Iowa, Minnesota, Nebraska, North Dakota, and South Dakota. The aim of this study is to establish the economic importance of the printing industry to the Printing Industry Midwest (PIM) regional economy.

First we report overall PIM regional figures and then provide additional breakdowns for each state within the region. In 2013 the printing industry directly contributed \$6.23 billion in output, 34,301 jobs, and \$1.54 billion in labor income to the five-state PIM Region. After calculating backward-linked supply chain effects or indirect economic contributions and household spending generated by labor income or induced economic contributions, these values increased significantly. Total economic contributions for the Printing Industry Midwest region amounts to \$12.92 billion in output, \$5.96 billion in Value-Added (GDP), 75,346 jobs, and \$3.24 billion in labor income.

The printing industry in the PIM region generates \$5.96 billion to Gross Domestic Product (GDP) annually through its direct economic impact and indirect/induced effects or approximately 0.86% of the region's \$690.5 billion total economic output. Compared to the overall national figures, the printing industry drives a larger percent of GDP than other regions. The national average for print is 0.51% of total GDP or \$85.7 billion.

The printing industry has a relatively strong relationship with other sectors of the economy in the PIM region leading to significant multipliers. For every additional \$1 in output, the printing industry generates an additional \$1.07 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 \$0.58 spending in backward-linked industries and \$0.49 in additional household spending. The backward-linked industries the printing industry has the strongest relationship with include manufacturing; wholesale trade; professional, scientific, and technical services; finance and insurance; management of companies and enterprises; and real estate, rentals, and leasing. 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.

Every additional job in the printing industry in the PIM region supports an additional 0.54 non-print jobs due to inter-industry effects and 0.66 jobs due to additional household spending—or an additional 1.20 jobs. The printing industry has a strong inter-industry relationship with other manufactures—36% of print’s inter-industry effect is with other manufacturing industries. Since manufacturing pays higher average salaries than the service sector, the compensation per additional job is high. For each job directly supported by the printing industry in the PIM region, the average labor income per job is \$44,883, and the indirect labor income per job is \$49,226.

Induced employment contributions are based on additional household spending cycling through the economy. The sectors of the PIM region that are most affected by the induced employment contribution include health care and social assistance; retail trade; and real estate, rental, and leasing. Each job directly generated by the printing industry results in 0.66 being supported through induced employment contributions. The induced jobs are lower paying on average because they are in industries with lower wages. The average labor income for these jobs is \$34,986 in the PIM region.

The PIM regional economy generated \$690.5 billion Gross Domestic Product (GDP) in 2013 or approximately 4.2% of total U.S. output. The largest industries in terms of percent of regional GDP in the PIM region are real estate, rental, and leasing (11.2%); finance and insurance (10.6%); agriculture, forestry, fishing, and hunting (8.0%); health care and social assistance (7.6%); durable goods manufacturing (7.2%); wholesale trade (6.5%); and nondurable goods manufacturing (6.3%). If we combine durable and nondurable goods manufacturing into one industry, it is the largest player at 13.5%. We do not include government in the list above (10.6%) because it is considered a final use of GDP in the input-output models. The industry rankings vary significantly between each state and warrant further analysis in the sections on each state.

Introduction

The aim of this study is to establish the economic importance of the printing industry to the Printing Industry Midwest regional economy. We define importance as the total contribution to the regional economy in terms of shipments, employment, labor income, and value-add/GDP. We used the definition of an Economic Contribution Study from an article written for *The Journal of Regional Analysis and Policy* below:

“Contribution analysis is a descriptive analysis that simply tracks the gross economic activity of the given event, policy, or industry as the dollars cycle through the region’s economy. The economic model is built to represent the structure and degree of interconnectedness in the regional economy with the output of each sector broken down and attributed to expenditures on intermediate inputs. The contribution analysis simply looks at the actual regional data and the current linkages that exist within the economy. The purpose of the analysis is to determine how much economic activity was associated with the industry. It is a “just the facts” type of analysis and is based on exploring the revealed preferences of how people spent their money. When related to an existing industry, a contribution analysis may provide evidence of how relatively large a sector is in the existing economy and how much economic activity is being cycled through the economy by a given industry¹.”

The results from our economic contribution study of the printing industry in the PIM regional economy will show the interconnectedness of the printing industry with the regional economy. We will be able to see how the industry in some states has a greater effect on the overall economy or more linkages than in other states. We will also get a clear understanding of how much economic activity is being cycled through the PIM regional economy because of the printing industry and calculate how much economic activity was associated with the industry.

The report is structured as follows. First we will provide a short overview of current printing industry conditions and define the market segments included in the printing industry. Second

¹ Determining Economic Contributions and Impacts: What is the difference and why do we care?, by Watson, Philip; Wilson, Joshua; Thilmany, Dawn; and Winter, Susan: *Journal of Regional Analysis and Policy*, JRPA 37(2): 1-15. Pedagogy in Regional Studies 2007 MCRSA.

we will review what is included in an economic contribution report and define each variable that is included in the model. Third we provide a section dedicated to the economic structure of the PIM regional economy and the printing industry's contribution. Lastly we will provide you with a model for each state in the PIM region, which will include both the economic structure and the economic activity that is associated with the printing industry.

The print shipments and employment statistics in this report are from the fiscal year 2013 and are compared to fiscal year 2013 overall economic conditions for each state in the PIM regional economy. In the current printing industry conditions section of the report, we will provide you with the most recent information available for the printing industry and the economy.

Current Printing Industry Conditions

Recent news on the economic front may mean the long-awaited recovery is gaining strength and the printing industry is benefitting. The employment situation has improved over the year with job growth averaging 324,000 per month in 2014. The manufacturing sector also added to payrolls in 2014 with an average monthly increase of 18,500 jobs. A fourth-quarter survey of manufacturers by the National Association of Manufacturers (NAM), *Industry Week*, projects manufacturing sales will increase by 4.5% over the next 12 months and employment will increase by 2.1 %. Print typically recovers at a slower pace than the economy but still should be provided a boost along with the rest of the manufacturing sector and general economy resulting in 2015 being an even better year for print.

In 2015 we expect economic growth of between 2.5 to 3.0%. The underlying fundamentals of our economy are improving, causing us to adjust our forecast in the positive direction. The fundamentals that have improved include healthy hiring, expected faster household formation, and firming business capital expenditures, resulting in strong domestic final-demand growth.

The two main potential downside risks to our economic outlook are downward pressure on business fixed investment and the balance of trade. With falling oil prices, we expect weaker business fixed investment in the oil industry, but the savings experienced by households are expected to help drive increased demand for other sectors of the economy. This should lead to increasing demand for other sectors' products/services, resulting in potential increased business fixed investment. This should help offset the drop from oil companies' expected pullback in business fixed investment. The same reasoning can be applied to hiring expectations for the oil industry and other sectors of the economy. A second potential drag on economic growth in 2015 is the balance of trade. We expect exports to suffer due to a stronger dollar, weaker global demand, and weaker demand for energy exports. We will continue to monitor these two trends, but as of today we expect stronger economic growth in 2015 compared to 2014.

In 2014 business started poorly for the printing industry with shipments declining in the first two quarters, but thanks to a strong final two quarters of 2014, shipments increased by 0.1% to \$84.8 billion. Capacity utilization steadily increased throughout the year to end at 72.8%—just 4.4% below pre-recession highs. The price printers can charge for products and services increased for the third straight year by 0.6% in 2014. Paper prices remain in check, only increasing by 1.4% in 2014 compared to 2.2% in 2013. The only measure that the printing

industry saw a significant decline in 2014 compared to 2013 was profitability. We only have data on the first three quarters of 2014 and expect improved profits in the final quarter due to strong sales and low input inflation (material and labor prices). For the first three quarters of 2014, the printing industry has earned profits of 4.7% of sales or \$2.495 billion, which is 11% less than what printers earned last year.

On the employment front, average weekly wages increased by 1.5% in the printing industry in 2014. The increase was due to a 0.5% increase in the number of hours worked and 1.0% increase in average hourly earnings. We expected employment to decline by 1.5% in 2014 and were pleasantly surprised that it declined by only 0.5%. Employment grew during six months of 2014, and based on improving business conditions and survey results from the Institute of Supply Management (ISM), we expect 2015 to be a slightly positive year for employment growth.

Printing Industry Overview			
Series	Percent Change Year-to-Date	Percent Change Compared to Previous Quarter	Current Reading
Shipments	+0.10%	+2.8%	\$84.8 billion
Capacity Utilization	+2.8%	+0.85%	72.8
Printing Prices	+0.6%	0.0%	113.3 Index reading
Paper Prices	+1.4%	+1.15%	137.0 Index reading
*Profitability	-11.1%	+5.4%	4.7% or \$2.495 billion
Average Hourly Earnings	+1.0%	+1.7%	\$22.83
Average Hours Worked	+0.5%	0.0%	37.7 hours
Average Weekly Wages	+1.5%	1.7%	\$860.69
Employment	-0.5%	-0.3%	459,167

*Only have data on the first nine months of 2014

On a national level, both the economy and print markets started improving at rates higher than the past few years. Based on preliminary results from the first quarter of 2015, we have seen evidence that this trend will continue into 2015.

The Printing Industry Defined

We use the Census Bureau’s County Business Pattern’s database to track the number of establishments and employees in the printing industry. We therefore use their definitions for print industry market segments.

The U.S. Census Bureau reclassified the North American Industry Classification System (NAICS) categories in 2012 and reduced the number of categories for industries experiencing consolidation like the printing industry. The NAICS is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy². In 2012 Commercial Print and Related Support Activities had twelve categories. After consolidation the number of categories for Commercial Printing and Related Support Activities is four.

NEW 2012 Commercial Printing and Related Support Activities NAICS Segments
1. Commercial print (except commercial screen and book printing) 323111 <i>Commercial lithographic printing</i> <i>Commercial gravure printing</i> <i>Commercial flexographic printing</i> <i>Quick printing</i> <i>Digital printing</i> <i>Manifold business forms printing</i> <i>Blank book, loose-leaf binders, and devices manufacturing</i> <i>Other commercial printing</i>
2. Commercial screen printing 323111
3. Commercial book printing 323117
4. Support activities for printing 323120 <i>Trade binding and related work</i> <i>Prepress services</i>
The categories in italics above were segments prior to 2012 but are now aggregated in either 323111 or 323120

² <http://www.census.gov/eos/www/naics/>

The market segment definitions below come directly from the U.S. Census Bureau³.

1) 323111 Commercial Printing (except Screen and Books)

This U.S. industry comprises establishments primarily engaged in commercial printing (except screen printing, books printing) without publishing (except grey goods printing). Printing processes used in this industry include lithographic, gravure, flexographic, letterpress, engraving, and various digital printing technologies. This industry includes establishments engaged in commercial printing on purchased stock materials, such as stationery, invitations, labels, and similar items, on a job order basis. Establishments primarily engaged in traditional printing activities combined with document photocopying services (i.e., quick printers) or primarily engaged in printing graphical materials using digital printing equipment are included in this industry.

2) 323113 Commercial Screen Printing

This U.S. industry comprises establishments primarily engaged in screen printing without publishing (except books, grey goods, and manifold business forms). This industry includes establishments engaged in screen printing on purchased stock materials, such as stationery, invitations, labels, and similar items on a job order basis. Establishments primarily engaged in printing on apparel and textile products, such as T-shirts, caps, jackets, towels, and napkins, are included in this industry.

3) 323117 Books Printing

This U.S. industry comprises establishments primarily engaged in printing or printing and binding books and pamphlets without publishing.

4) 323120 Support Activities for Printing

This industry comprises establishments primarily engaged in performing prepress and postpress services in support of printing activities. Prepress services may include such things as platemaking, typesetting, trade binding, and sample mounting. Postpress services include such things as book or paper bronzing, diecutting, edging, embossing, folding, gilding, gluing, and indexing.

³ <http://www.census.gov/eos/www/naics/index.html>

PIM Economic & Fiscal Contribution Model

The PIM Economic Contribution Model was developed using the RIMS II Multipliers. These multipliers are calculated and maintained by the Bureau of Economic Analysis (BEA). They are considered regional Input-Output multipliers (I-O). Regional I-O multipliers are based on a detailed set of industry accounts that measure the goods and services produced by each industry and the use of these goods and services by industries and final users. The multipliers used in this model were updated in 2010 and applied to 2013 shipments and employment data we collected from the Census Bureau. This model will be updated for PIM as new multipliers are provided by the BEA and updated figures on shipments and employment are made available by the Census Bureau.

The RIMS II multipliers are “Final Demand Multipliers” because they do not include intermediate inputs in their calculation for the first variable in our model “Direct Economic Contribution.” All of the intermediate and additional economic value generated by the printing industry are included in the “Indirect” and “Induced” economic contributions.

The Final-Demand Region consists of the geographic area in which the total final demand is measured. The choice of region is one of the most important choices that can be made in an economic contribution study. It is important to choose the region based on the level of measurement we have for shipments, which is the state level. Using Type II multipliers, the region should encompass where workers spend most of their earnings or labor income. Since we are not measuring the impact of a specific investment—like a new plant in a city—but rather the overall effect of the industry in a state, we choose a larger region or the entire state.

According to the RIMS II Handbook⁴ an industry’s contribution to a region can be calculated in two steps. In our model the region is first defined as each state and then aggregated to the five-state PIM region.

Step 1: Collect information on the total value of the industry’s output. The source we use for this information comes from the Printing Industries of America Print Market Atlas Database. To calculate the total value of shipments in the Print Market Atlas, we use data from the Census Bureau’s County Business Patterns database and the PIA *Ratios* Financial Benchmarking study.

⁴ RIMS II An essential tool for regional developers and planners. Bureau of Economic Analysis U.S. Department of Commerce. www.bea.gov

Step 2: Multiply the total value of the industry’s output by the final demand multipliers for the industry. The results can be interpreted as the total amount of local economic activity that is currently supported by the industry. In our study local economic activity is measured in terms of output, value-add (GDP), earnings (labor income), and employment.

The Model

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

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 I-O 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 investment⁵.

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

⁵ Bureau of Economic Analysis, U.S. Department of Commerce, Concepts and Methods of the U.S. Input-Output Accounts.

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 BEA we recommend reading the RIMS II handbook, “An essential tool for regional developers and planners.”

Fiscal Contributions

The economic activity generated by the printing industry also contributes significantly to federal, state and local governments. We estimated these fiscal contributions using data from the PIA *Ratios* financial benchmarking database, Fiscal Year 2013 Analytical Perspectives Budget of the U.S. Government from the Office of Management and Budget, and the Tax Foundation.

Federal Taxes

To calculate each federal tax contribution we first calculated the ratio of, state print GDP to total U.S. GDP, and multiplied that by the total national tax collected in 2013. For example:

$(\text{Total PIM Regional Print GDP} \div \text{Total U.S. Nominal GDP}) * \text{Total Federal Income Taxes 2013}$

OR

$(\$2.93 \text{ billion} \div \$16.77 \text{ trillion}) * \$1.36 \text{ trillion} = \$237.4 \text{ million in Federal Income Taxes generated by PIM regional print output in 2013.}$

We performed this similar calculation for each state in the PIM region and for each type of federal tax.

State and Local Taxes

The tax policies for each state and local government vary significantly. For that reason we used data collected by the Tax Foundation to estimate state and local taxes on a per capita basis. We also used the PIA *Ratios* data on real estate and property taxes to calculate local property taxes collected directly from printers in the PIM region. These estimates are on the conservative side because we only used industry direct employment and output figures so to avoid double counting or exaggerating the fiscal impact generated by the printing industry.

Below is an example of how we calculated Sales or Use Taxes generated by the economic activity of the printing industry in Iowa. We used a similar methodology to calculate individual income taxes, corporate income taxes, excise taxes, property taxes, etc. for each state and local government.

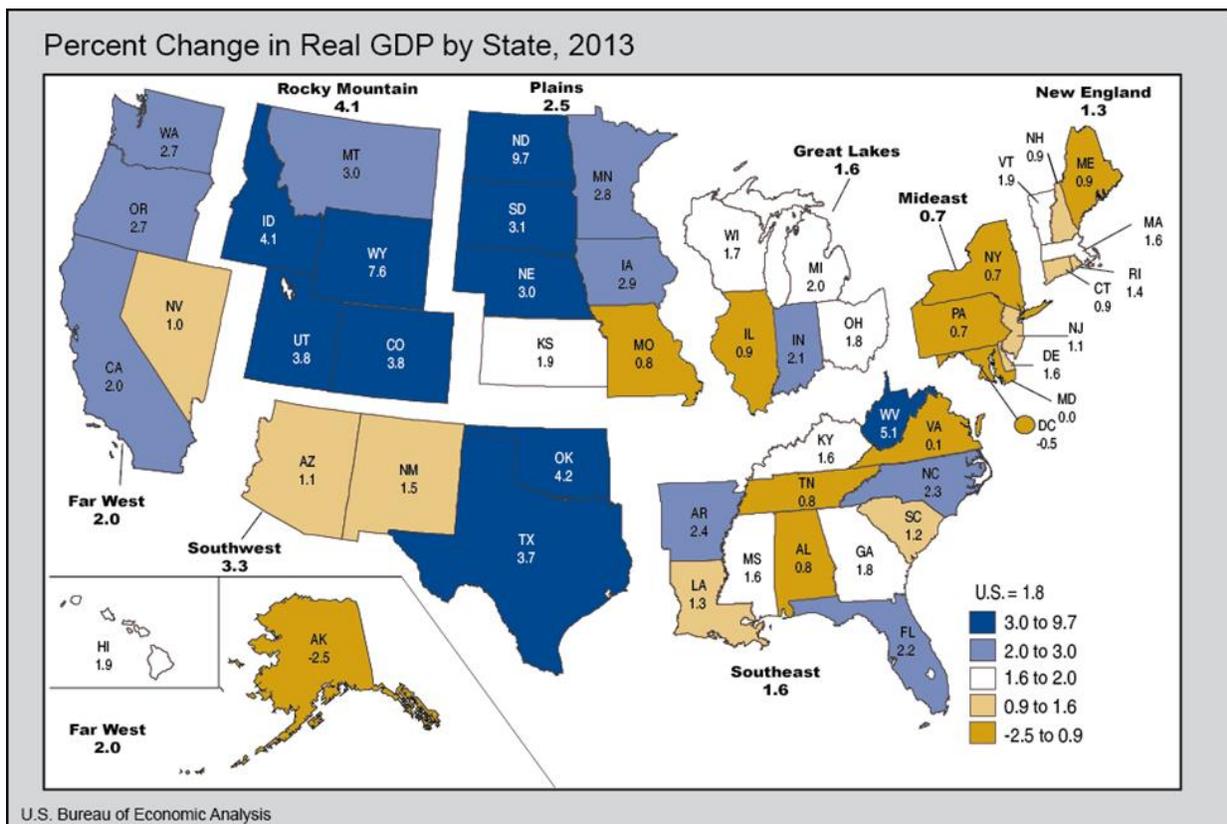
Sales or Use Tax Per Capita in Iowa * Count of Direct Employees in the Iowa Printing Industry

OR

\$1,047 Sales Tax Per Capita * 6,559 Employees = \$6.87 million in Sales or Use Tax collected in Iowa generated by print economic activity.

The Economic Structure of the PIM Regional Economy

In 2013 the economies of the five-state PIM region of Iowa, Minnesota, Nebraska, North Dakota, and South Dakota produced \$690.5 billion in total nominal gross domestic product (GDP) or around 4.0% of total U.S. economic output. Minnesota alone accounts for nearly half of the total regional output and Iowa accounts for about one-fourth. The five states are located in a region of the U.S. that the BEA classifies as the Plains region. The Plains region includes the five PIM states and Missouri and Kansas. Overall, the Plains regional economy grew by 2.5% in Real GDP in 2013 compared to 2.2% for the aggregate U.S. economy.



inflation-adjusted growth rate. In fact, all PIM states expanded in excess of the U.S. average in 2013 reflecting their favorable mix of industries.

Agriculture, forestry, fishing, and hunting is the fourth largest industry in the region generating 8% of regional output in 2013. This sector's output increased by 36% in 2013 accounting for 37.2% of PIM regional economic growth or contributing 2.2% to the total 6.0% growth for the region in 2013. The industry growing at the second fastest rate in 2013 was mining. Mining output increased by 18.5%. Despite only generating 1.8% of regional output it accounted for 4.9% of growth in 2013 or contributed 0.3% to change in output in 2013.

Gross Domestic Product In Printing Industry Midwest Region (millions of current dollars)							
Industry	GDP (millions of current dollars)		Percent Change 2012 to 2013	Share of Growth	Contribution to Change in Output	Percent Share of State Output	
	2012	2013				2012	2013
Manufacturing	91,344	93,616	2.5%	5.8%	0.3%	14.0%	13.6%
Real estate and rental and leasing	73,713	77,070	4.6%	8.5%	0.5%	11.3%	11.2%
Finance and insurance	53,957	56,922	5.5%	7.5%	0.5%	8.3%	8.2%
Agriculture, forestry, fishing, and hunting	40,575	55,218	36.1%	37.2%	2.2%	6.2%	8.0%
Health care and social assistance	50,024	52,173	4.3%	5.5%	0.3%	7.7%	7.6%
Wholesale trade	42,857	45,132	5.3%	5.8%	0.3%	6.6%	6.5%
Retail trade	35,927	37,262	3.7%	3.4%	0.2%	5.5%	5.4%
Professional, scientific, and technical services	29,411	30,525	3.8%	2.8%	0.2%	4.5%	4.4%
Construction	26,011	27,917	7.3%	4.8%	0.3%	4.0%	4.0%
Transportation and warehousing	24,553	25,592	4.2%	2.6%	0.2%	3.8%	3.7%
Information	19,751	19,887	0.7%	0.3%	0.0%	3.0%	2.9%
Management of companies and enterprises	16,381	17,814	8.7%	3.6%	0.2%	2.5%	2.6%
Accommodation and food services	14,100	14,717	4.4%	1.6%	0.1%	2.2%	2.1%
Administrative and waste management services	14,326	14,501	1.2%	0.4%	0.0%	2.2%	2.1%
Other services, except government	13,229	13,608	2.9%	1.0%	0.1%	2.0%	2.0%
Utilities	11,788	12,381	5.0%	1.5%	0.1%	1.8%	1.8%
Mining	10,312	12,224	18.5%	4.9%	0.3%	1.6%	1.8%
Educational services	5,720	5,778	1.0%	0.1%	0.0%	0.9%	0.8%
Arts, entertainment, and recreation	4,915	4,945	0.6%	0.1%	0.0%	0.8%	0.7%
Government	72,314	73,241	1.3%	2.4%	0.1%	11.1%	10.6%
All industry total	651,208	690,523	6.0%	100.0%	6.0%	100.0%	100.0%

The five largest industries in the PIM region in terms of output are Manufacturing (\$93.6 billion), Real estate and rental and leasing (\$77.1 billion), Finance and insurance (\$56.9 billion), Agriculture, forestry, fishing, and hunting (\$55.2 billion), and Healthcare and social assistance (\$52.17 billion). We do not include government spending in our industry ranking below because it is not included as an “Industry” in the RIMS II tables. Instead it is included as a “Final Uses GDP” similar to personal consumption or balance of trade. In the chart below we take a closer look at share of output each industry generates by state and the total PIM Region.

Gross domestic product (GDP) by state (millions of current dollars)

PIM Ranking	Industry	Iowa	Minnesota	Nebraska	North Dakota	South Dakota	PIM Total Output
1	Manufacturing	28,416	43,743	13,960	3,251	4,246	93,616
2	Real estate and rental and leasing	17,182	39,745	10,426	5,519	4,198	77,070
3	Finance and insurance	16,871	22,227	8,380	2,202	7,242	56,922
4	Agriculture, forestry, fishing, and hunting	16,058	14,066	11,429	7,285	6,380	55,218
5	Health care and social assistance	10,649	26,857	7,397	3,392	3,878	52,173
6	Wholesale trade	10,066	21,680	5,994	4,500	2,892	45,132
7	Retail trade	9,219	16,249	5,833	2,958	3,003	37,262
8	Professional, scientific, and technical services	5,048	18,154	4,534	1,622	1,167	30,525
9	Construction	6,459	12,357	4,604	2,866	1,631	27,917
10	Transportation and warehousing	5,467	8,413	7,828	2,849	1,035	25,592
11	Information	4,177	10,847	2,629	1,100	1,134	19,887
12	Management of companies and enterprises	1,834	12,168	2,753	527	532	17,814
13	Accommodation and food services	3,403	6,903	2,101	1,177	1,133	14,717
14	Administrative and waste management services	3,317	7,333	2,487	706	658	14,501
15	Other services, except government	3,328	6,323	2,228	847	882	13,608
16	Utilities	2,789	5,771	1,782	1,319	720	12,381
17	Mining	432	2,701	386	8,476	229	12,224
18	Educational services	1,488	3,037	826	137	290	5,778
19	Arts, entertainment, and recreation	1,043	2,907	556	163	276	4,945
	Government	18,521	30,600	13,481	5,432	5,207	73,241
	All Industry Total	\$165,767	\$312,081	\$109,614	\$56,329	\$46,732	\$690,523
<p>GOVERNMENT: is not considered a commodity in the Use Table. It is considered a "Final Use" and is included in the Calculation for State GDP and national GDP but not as an "Industry" in the RIMS II tables of 20 industries that we use to calculate Indirect and Induced effects. Since the Government does not create economic value but instead redistributes it, this is an appropriate view.</p>							
<p>The top five industries in terms of economic output are highlighted for each state and the total PIM regional output.</p>							

On a per capita basis, PIM state residents average \$54,425 in state GDP—over \$5,300 or 10.8% more than the U.S. average per capita GDP. North Dakota residents enjoyed the highest GDP Per Capita at \$68,804, followed by Minnesota (\$53,340), Nebraska (\$52,582), Iowa (\$48,703), and South Dakota (\$48,696).

The Plains Region of the U.S.—and more specifically the PIM Region—was not hit as harshly by the Great Recession. Both output and employment did not decline as drastically as in the rest of the United States. Unemployment in the PIM Region is substantially less than the U.S. as a

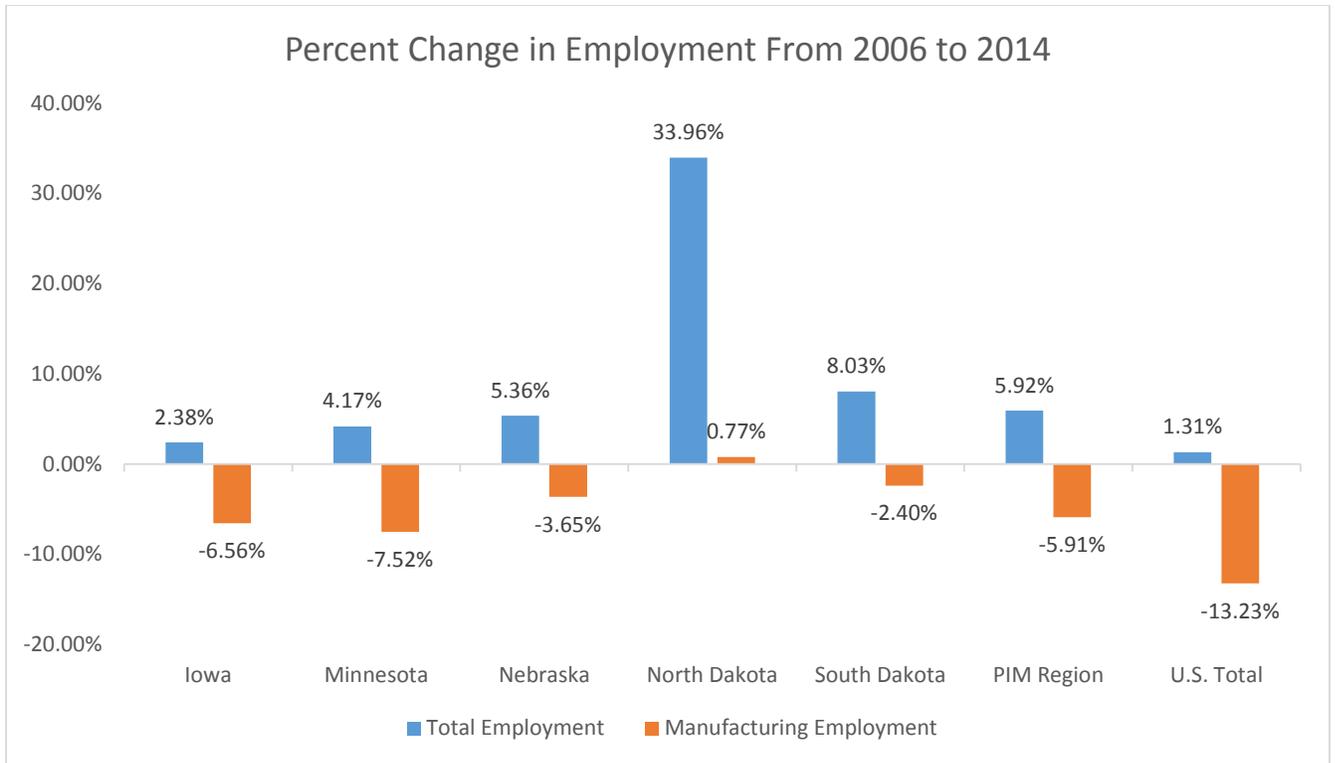
whole. Indeed, the average unemployment rate in this five-state region is 40.0% less than the national average. There are only five states with unemployment under 4.0% as of mid-year 2013, and three are located in the PIM Region. North Dakota has the lowest unemployment rate in the U.S. at 2.7%.

According to the USDA Economic and Research Service analysis of U.S. Bureau of Labor Statistics, during the Great Recession, unemployment only increased by 1.1% in North Dakota, 1.9% in Nebraska, 2.5% in Iowa, 2.6% in South Dakota, and 3.0% in Minnesota. The national average increase in the unemployment rate during the recession was 5.3%. Why was the PIM region not hit as hard by the recession as other regions of the U.S.? According to the United States Department of Agriculture (USDA) study on Rural Employment Trends in Recession and Recovery, there are three main reasons for the region's relatively shallow drop in employment.

The variable that had the strongest effect was a favorable mix of industries. This region is more dependent than other regions on agriculture for employment while most other regions are more dependent on manufacturing, which was harder hit during the recession. Second was the educational composition of the region. In the PIM region 52% of the adult population has at least some college education compared to the 46% national average. Higher educated citizens were less affected by the recession than those who failed to attend college. Lastly lower population growth also contributed to limiting the increase in unemployment during the recession⁶.

The PIM region is also significantly outperforming the nation in employment growth during the period before the Great Recession (2007–2009) all the way through the current recovery. From 2006 to mid-2014, on average, the five-state PIM region employment increased by 5.9% compared to only 1.3% for all states. Again, North Dakota leads all states in this metric with a phenomenal 34% gain in employment.

⁶ Hertz, T., Kusmin, L., Marre, A., & Parker, T., "Rural Employment Trends in Recession and Recovery." United States Department of Agriculture. August 2014.



Source: Bureau of Labor Statistics

Manufacturing employment is an entirely different story. Overall, manufacturing employment in the U.S. is down by 13% since 2006. On average, PIM states experienced manufacturing declines less than half that rate, or -5.9%. North Dakota bucked the national trend and gained almost 1.0%.

The five states in the PIM region had a population of 11,950,000 at the end of 2013 or approximately 3.8% of the total U.S. population of more than 316 million. The largest industries in terms of employment are health care and social assistance (15.0%); retail trade (11.7%); manufacturing (10.4%); accommodation and food services (7.5%); and agriculture, forestry, fishing, and hunting (6.7%). This region accounts for almost 13.0% of total U.S. agricultural, forestry, fishing, and hunting employment. The Agricultural, forestry, fishing and hunting sector employees 436,419 people in the PIM region or about 7.0% of the workforce. It also generates 8.0% of the region’s output and the health of the agriculture industry from 2007–2009 is one of the major reasons why the recession did not hit the PIM region as hard as the rest of the U.S.

Employment By Industry													
		Iowa		Minnesota		Nebraska		North Dakota		South Dakota		PIM Regional Economy	
Rank		Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
1	Health care and social assistance	232,360	14.3%	474,795	15.9%	136,020	13.4%	62,867	14.7%	68,476	15.3%	974,518	15.0%
2	Retail trade	198,810	12.2%	328,353	11.0%	120,030	11.9%	53,058	12.4%	58,444	13.1%	758,695	11.7%
3	Manufacturing	208,428	12.8%	301,601	10.1%	94,410	9.3%	24,506	5.7%	44,562	10.0%	673,507	10.4%
4	Accommodation and food services	117,276	7.2%	224,591	7.5%	71,466	7.1%	35,368	8.3%	38,853	8.7%	487,554	7.5%
5	Agriculture, forestry, fishing, and hunting	138,958	8.5%	119,031	4.0%	80,116	7.9%	46,759	10.9%	51,555	11.5%	436,419	6.7%
6	Professional, scientific, and technical services	69,805	4.3%	191,627	6.4%	90,986	9.0%	17,945	4.2%	17,148	3.8%	387,511	6.0%
7	Finance and insurance	99,136	6.1%	168,045	5.6%	65,787	6.5%	19,319	4.5%	29,558	6.6%	381,845	5.9%
8	Administrative and waste management services	91,840	5.6%	185,108	6.2%	61,910	6.1%	15,181	3.6%	14,688	3.3%	368,727	5.7%
9	Other services, except government	80,590	4.9%	164,013	5.5%	55,353	5.5%	20,167	4.7%	23,391	5.2%	343,514	5.3%
10	Construction	82,923	5.1%	137,787	4.6%	53,073	5.2%	27,283	6.4%	24,747	5.5%	325,813	5.0%
11	Wholesale trade	70,121	4.3%	136,203	4.6%	43,278	4.3%	22,359	5.2%	18,614	4.2%	290,575	4.5%
12	Transportation and warehousing	65,351	4.0%	98,858	3.3%	40,583	4.0%	20,901	4.9%	12,346	2.8%	238,039	3.7%
13	Management of companies and enterprises	16,648	1.0%	133,044	4.5%	18,138	1.8%	4,881	1.1%	5,105	1.1%	177,816	2.7%
14	Educational services	50,009	3.1%	83,254	2.8%	13,628	1.3%	5,746	1.3%	9,430	2.1%	162,067	2.5%
15	Real estate and rental and leasing	34,253	2.1%	75,738	2.5%	24,037	2.4%	11,418	2.7%	10,840	2.4%	156,286	2.4%
16	Arts, entertainment, and recreation	30,247	1.9%	69,033	2.3%	19,305	1.9%	7,755	1.8%	9,294	2.1%	135,634	2.1%
17	Information	32,005	2.0%	66,672	2.2%	21,523	2.1%	7,545	1.8%	7,155	1.6%	134,900	2.1%
18	Utilities	7,997	0.5%	17,858	0.6%	1,821	0.2%	3,279	0.8%	2,118	0.5%	33,073	0.5%
19	Mining	2,110	0.1%	5,829	0.2%	1,222	0.1%	20,880	4.9%	1,131	0.3%	31,172	0.5%
	Total	1,628,867	100%	2,981,440	100%	1,012,686	100%	427,217	100%	447,455	100%	6,497,665	100%

Sources: U.S. Census Bureau County Business Patterns Database Employer and Non-employer, USDA National Agricultural Statistics Service

Lastly we compare how households have fared in terms of median household income in the PIM region compared to the national average. On average PIM households have a median income that is 1.7% greater than the national average. Minnesota’s median household income in 2013 was 11% greater than the national average, followed by Iowa (+5.6%), South Dakota (+3.0%), North Dakota (–1.6%), and Nebraska (–11.7%). More important than the absolute figures is how median household incomes changed over the past few years. Since the end of the Great Recession in the U.S., on average, median household incomes have declined by 1.37% after adjusting for inflation. From 2007 to 2013, the average annual change was –1.16%. As you can see in the chart below the PIM region again has outperformed the national average with an average annual change in median household incomes since the end of the recession increasing by 0.32% and from pre-recession to 2013 increasing by 0.12% per year.

Median Household Income by State							
State	Unadjusted for Inflation				Adjusted for Inflation		
	2013 (Current Dollars)	Percent Change Since End of Recession	Percent Change From Before the Recession to 2013	Average Annual Increase 2006 to 2013	Average Annual Increase since the end of the recession	Average Annual Change Since the End of the Recession	Average Annual Change 2013 to 2007
United States	51,939	5.40%	7.76%	1.11%	1.80%	-1.37%	-1.16%
Iowa	54,855	11.91%	13.98%	2.00%	3.97%	-0.15%	-0.16%
Minnesota	60,907	16.41%	8.35%	1.19%	5.47%	0.21%	-0.86%
Nebraska	53,774	2.42%	11.69%	1.67%	0.81%	0.02%	-0.44%
North Dakota	52,888	3.69%	28.85%	4.12%	1.23%	-0.82%	2.13%
South Dakota	54,453	20.07%	19.87%	2.84%	6.69%	3.11%	0.95%
Printing Industry Midwest Average	55,375	10.66%	15.87%	2.27%	3.55%	0.32%	0.12%

Source: United States Bureau of Labor Statistics

The PIM regional economy weathered the Great Recession better than the overall U.S. economy and has continued to recover at above-average rates. In 2013 nominal output increased by 6.0%. After adjusting for 1.4% regional inflation real final output increased by 4.6%. The largest industries in terms of output in the region are, in order, manufacturing; real estate, rental, and leasing; finance and insurance; agriculture, forestry, fishing, and hunting; and health care and social assistance. The largest contributors to growth in 2013 were agriculture, forestry, fishing, and hunting (increased 36.1%, contributing 2.2% to total output); real estate, rental, and leasing (increased 4.6%, contributing 0.5% to total output); finance and insurance (increased by 5.5%, contributing 0.5% to total output); manufacturing (increased by 2.5%, contributing 0.3% to total output); and mining (increased 18.5%, contributing 0.3% total output). Employment and

household earnings also held up better through the recession and rebounded faster in the PIM region. From 2006 to 2014 employment in the PIM Region is up 5.9% and manufacturing employment is down only 5.9%. Total employment for the U.S. during that same time period is only up 1.3% and manufacturing employment is still down 13.2%. Median household income, unadjusted for inflation, is up 10.7% since the end of the recession in the PIM Region compared to 5.4% for the U.S. overall. After adjusting for inflation that average annual change in median household income for the PIM region is 0.32%. Before adjusting for inflation the increase was 2.27%. Total U.S. median household incomes have not kept up with inflation. Since the end of the recession, household income is up 5.4%. The average annual increase for median household income for this time period was 1.11%. After adjusting for inflation, that figure actually turns to a negative 1.37%. With every industry in the PIM region reporting growth from a high of 36.1% in agriculture to a low of 0.7% in information, the overall health of the regional economy is good.

Printing Industry Economic Contribution in the PIM Regional Economy

In 2013 the printing industry directly contributed \$6.23 billion in output, 34,301 jobs, and \$1.45 billion in labor income in the five-state PIM Region. After calculating backward-linked supply chain effects or indirect economic contributions and household spending generated by labor income or induced economic contributions, these values increased significantly. Total economic contributions for the Printing Industry Midwest region amounts to \$12.92 billion in output, \$5.96 billion in value-added (GDP), 75,346 jobs, and \$3.24 billion in labor income.

Backward-linked supply chain effects or indirect contributions accounted for 28% or \$3.62 billion of total economic contribution, 24.4% of employment contribution or 18,390 jobs, and 28% of labor income contribution or \$905.3 million. Household spending generated by labor income or induced economic contributions accounted for \$3.06 billion or 23.7% of total economic contribution, 30.1% of employment contribution or 22,656 jobs, and 24.5% of labor income contribution or \$792.6 million.

Printing Industry Economic Contribution in the PIM Regional Economy				
	Direct Contribution	Indirect Contribution	Induced Contribution	Total Economic Contribution
Output (\$1,000s)	\$6,230,760.9	\$3,624,167.1	\$3,064,504.4	\$12,919,432.4
Employment	34,301	18,390	22,656	75,346
Labor Income (\$1,000s)	\$1,539,515.9	\$905,268.4	\$792,636.6	\$3,237,420.9
Value Added or GDP (\$1,000s)	\$2,928,457.6	\$1,213,127.5	\$1,813,614.5	\$5,955,199.7

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

The printing industry in PIM generates \$5.96 billion GDP annually through its direct economic impact and indirect/induced effects or approximately 0.86% of the region's \$690.5 billion total economic output. Compared to the overall national figures, the printing industry drives a larger percent of GDP than other regions. The national average is 0.49% of total GDP.

The printing industry has a relatively strong relationship with other sectors of the economy in the PIM region leading to significant multipliers. For every additional \$1 in output, the printing industry generates an additional \$1.07 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 \$0.58 spending in backward-linked industries and \$0.49 spending by households. The backward-linked industries the printing industry has the strongest relationship with include manufacturing; wholesale trade; professional, scientific, and technical services; finance and insurance; management of companies and enterprises; and real estate, rentals, and leasing. 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. See chart below for further detail on print's indirect and induced impact on each industry.

Indirect and Induced Output Effects by Industry from Printing Industry Production, Printing Industry Midwest Region, 2013

Rank	Industry	Indirect		Induced		Indirect + Induced	
		(\$1,000s)	% of Total	(\$1,000s)	% of Total	(\$1,000s)	% of Total
1	Manufacturing	1,414,958.5	39.0%	317,158.6	10.4%	1,732,117.2	25.9%
2	Real estate and rental and leasing	200,797.1	5.5%	541,615.0	17.7%	742,412.1	11.1%
3	Finance and insurance	232,182.3	6.4%	405,554.5	13.2%	637,736.8	9.5%
4	Wholesale trade	408,845.2	11.3%	160,556.6	5.2%	569,401.9	8.5%
5	Health care and social assistance	2,073.4	0.1%	446,950.3	14.6%	449,023.7	6.7%
6	Professional, scientific, and technical services	282,823.0	7.8%	107,572.7	3.5%	390,395.7	5.8%
7	Retail trade	23,421.3	0.6%	288,440.8	9.4%	311,862.1	4.7%
8	Transportation and warehousing	219,263.6	6.0%	88,354.3	2.9%	307,617.9	4.6%
9	Information	121,245.1	3.3%	117,926.5	3.8%	239,171.5	3.6%
10	Management of companies and enterprises	207,426.4	5.7%	31,571.4	1.0%	238,997.9	3.6%
11	Administrative and waste management services	179,832.5	5.0%	57,650.7	1.9%	237,483.2	3.6%
12	Utilities	105,987.6	2.9%	74,516.9	2.4%	180,504.6	2.7%
13	Other services	49,054.22	0.01	123,998.9	4.0%	173,053.1	2.6%
14	Food services and drinking places	43,647.2	1.2%	104,106.3	3.4%	147,753.5	2.2%
15	Agriculture, forestry, fishing, and hunting	24,525.2	0.7%	58,086.9	1.9%	82,612.2	1.2%
16	Construction	52,941.9	1.5%	15,518.1	0.5%	68,460.0	1.0%
17	Accommodation	33,361.7	0.9%	31,026.0	1.0%	64,387.8	1.0%
18	Educational services	4,222.0	0.1%	57,238.1	1.9%	61,460.1	0.9%
19	Arts, entertainment, and recreation	14,891.4	0.4%	34,135.3	1.1%	49,026.7	0.7%
20	Mining	3,583.0	0.1%	1,609.7	0.1%	5,192.7	0.1%
Total		3,625,082.7	100.0%	3,063,587.8	100.0%	6,688,670.6	100.0%

Sources: BEA RIMS Multipliers, Census Bureau County Business Patterns, and PIA Print Market Atlas

Note: Total direct output contributions from printing industry production in the Printing Industry Midwest Region were \$6.231 billion in 2013. Total Economic Contributions were \$12.919 billion.

Every additional job in the printing industry supports an additional 0.54 non-print jobs due to inter-industry effects and 0.66 jobs due to additional household spending or an additional 1.2

jobs. The printing industry has a strong inter-industry relationship with other manufacturers—36% of print’s inter-industry effect is with other manufacturing industries. Since manufacturing pays higher average salaries than the service sector, the compensation per additional job is high. For each job directly supported by the printing industry in the PIM region, the average labor income per job is \$44,883, and the indirect labor income per job is \$49,226.

Induced employment contributions are based on additional household spending cycling through the economy. The sectors of the PIM region that are most affected by the induced employment contribution include health care and social assistance; retail trade; and real estate, rental, and leasing. Each job directly generated by the printing industry results in 0.66 being supported through induced employment contributions. The induced jobs are lower paying on average because they are in industries with lower wages. The average labor income for these jobs is \$34,986 in the PIM region. See chart on the following page for further detail on print’s indirect and induced impact on each industry’s employment.

Indirect and Induced Employment Effects by Industry from Printing Industry Production, Printing Industry Midwest Region, 2013

Rank	Industry	Indirect		Induced		Indirect + Induced	
		Jobs	% of Total	Jobs	% of Total	Jobs	% of Total
1	Manufacturing	6,620	36.0%	950	4.2%	7,571	18.4%
2	Health care and social assistance	13	0.1%	4,286	18.9%	4,299	10.5%
3	Retail trade	244	1.3%	3,747	16.5%	3,991	9.7%
4	Administrative and waste management services	2,517	13.7%	958	4.2%	3,474	8.5%
5	Real estate and rental and leasing	654	3.6%	2,350	10.4%	3,003	7.3%
6	Food services and drinking places	639	3.5%	1,872	8.3%	2,511	6.1%
7	Professional, scientific, and technical services	1,724	9.4%	782	3.5%	2,506	6.1%
8	Finance and insurance	702	3.8%	1,569	6.9%	2,271	5.5%
9	Other services	495	2.7%	1,558	6.9%	2,052	5.0%
10	Wholesale trade	1,364	7.4%	658	2.9%	2,022	4.9%
11	Transportation and warehousing	1,225	6.7%	614	2.7%	1,839	4.5%
12	Educational services	58	0.3%	1,004	4.4%	1,062	2.6%
13	Arts, entertainment, and recreation	212	1.2%	611	2.7%	823	2.0%
14	Management of companies and enterprises	685	3.7%	124	0.5%	809	2.0%
15	Information	299	1.6%	358	1.6%	657	1.6%
16	Accommodation	292	1.6%	331	1.5%	623	1.5%
17	Construction	359	2.0%	131	0.6%	490	1.2%
18	Agriculture, forestry, fishing, and hunting	130	0.7%	250	1.1%	381	0.9%
19	Households	0	--	367	1.6%	367	0.9%
20	Utilities	151	0.8%	130	0.6%	281	0.7%
21	Mining	7	0.0%	5	0.0%	12	0.0%
Total		18,390	100.0%	22,655	100.0%	41,045	100.0%

Sources: BEA RIMS Multipliers, Census Bureau County Business Patterns, and PIA Print Market Atlas

Note: Total direct employment contributions from printing industry production in the Printing Industry Midwest Region were 34,301 jobs in 2013. Total Employment Contributions were 75,346 jobs.

The PIM regional economy generated \$690.5 billion Gross Domestic Product (GDP) in 2013 or approximately 4.0% of total U.S. output. The largest industries in terms of percent of regional GDP in the PIM region are real estate, rental, and leasing (11.2%); finance and insurance (10.6%); agriculture, forestry, fishing, and hunting (8.0%); health care and social assistance (7.6%); durable goods manufacturing (7.2%); wholesale trade (6.5%); and nondurable goods manufacturing (6.3%). When we combined durable and nondurable goods manufacturing into one industry, it is the largest player at 13.6%. We do not include government in the list above (10.6% of output) because it is considered a final use of GDP in the input-output models. The industry rankings vary significantly between each state and warrant further analysis in the sections on each state. As you can see in the chart on the following page, 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.

For example: manufacturing accounts for 13.6% of total economic output in the PIM regional economy, or it is the largest industry. Almost 26% of the printing industry’s indirect and induced contributions to the regional economy are circulated through the manufacturing industry. In fact, the three largest industries in the PIM region also are the three highest ranked in terms of percent of the printing industry’s indirect and induced contribution to the regional economy. The fourth largest industry in the region—agriculture, forestry, fishing and hunting—breaks this trend. It is a large industry in the region (8.0% of total regional output) but has little interconnectedness with the printing industry (1.2% of indirect/induced economic contribution). The printing industry does not have much in terms of backward-linked supply chain effects or indirect economic contributions or household spending generated by labor income with agriculture, forestry, fishing, and hunting. See the chart below 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.

Top PIM Regional Industries Compared to Industries' Indirect and Induced Relationship with the Printing Industry				
Overall Industry Rank in Terms of Output in the PIM Region	Industry	Percent of PIM Regional GDP by Industry	Printing Industry Indirect and Induced Output % of Total	Industries Ranked by Percent of Indirect and Induced Output Generated Via Print Contributions
1	Manufacturing	13.56%	25.9%	1
2	Real estate and rental and leasing	11.16%	11.1%	2
3	Finance and insurance	8.24%	9.5%	3
4	Agriculture, forestry, fishing, and hunting	8.00%	1.2%	15
5	Health care and social assistance	7.56%	6.7%	5
6	Wholesale trade	6.54%	8.5%	4
7	Retail trade	5.40%	4.7%	7
8	Professional, scientific, and technical services	4.42%	5.8%	6
9	Construction	4.04%	1.0%	16
10	Transportation and warehousing	3.71%	4.6%	8
11	Information	2.88%	3.6%	9
12	Management of companies and enterprises	2.58%	3.6%	10
13	Accommodation and food services	2.13%	3.2%	12
14	Administrative and waste management services	2.10%	3.6%	11
15	Other services, except government	1.97%	2.6%	14
16	Utilities	1.79%	2.7%	13
17	Mining	1.77%	0.1%	19
18	Educational services	0.84%	0.9%	17
19	Arts, entertainment, and recreation	0.72%	0.7%	18

Federal, state, and local tax revenues generated by the PIM printing industry totaled \$740.18 million. The printing industry added \$2.93 billion in direct value-added output to the PIM regional gross domestic product and 25.3% of this output was collected by the federal, state, and local governments in taxes. The main source of federal tax revenues was individual income taxes (47%) and social security taxes (33%). Eight percent of PIM printing industry revenues or \$233.36 million were collected to help fund the state and local governments. Property taxes (35%) and individual income taxes (29%) were the two main sources of revenue for state and local governments.

2013 Federal, State and Local Taxes Generated by the Printing Industry in the PIM Region	
Type of Tax	Taxes Collected (\$ Millions)
Federal Taxes	
Individual income tax	\$237.39
Corporate income tax	\$60.72
Social security taxes	\$167.50
Excise taxes	\$15.39
Other taxes	\$25.81
Total Federal Taxes	\$506.82
Type of Tax	Taxes Collected (\$ Millions)
State Taxes and Local	
Individual income tax	\$66.92
Corporate income tax	\$10.81
Sales or Use Tax	\$34.54
Excise taxes	\$23.55
Property Taxes	\$82.57
Other taxes	\$9.69
License Taxes	\$9.69
Total State and Local Taxes	\$233.36
Total Fiscal Contribution	\$740.18

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

Over the next two years we will continue to track the inter-relationships between the printing industry and other industries within the region. As various industries continue to grow at above-average rates such as agriculture, mining, and management of companies and enterprises, we will monitor how their indirect and induced relationships change with the printing industry. As

various industries continue to decline in terms of output or grow at below-average rates like arts/entertainment, information, and educational services, we will monitor how their indirect and induced relationships change with the printing industry. Knowing the change in output and the relationship various industries have with our industry is helpful to PIM printers that currently service a sector that is either in growth or decline to better forecast demand. It also help suppliers, association executives, policy makers, and other stakeholders better understand how changes in the printing industry will affect other industries.

IOWA: Printing Industry Economic Contribution



In 2013 the printing industry directly contributed \$1.19 billion in output, 6,559 jobs, and \$257.15 million in labor income to Iowa’s economy. After calculating backward-linked supply chain effects or indirect economic contributions and household spending generated by labor income or induced economic contributions, these values increased significantly. Total economic contributions for the Iowa economy amounted to \$2.06 billion in output, \$914.93 million in Value-Added (GDP), 11,707 jobs, and \$449.16 million in labor income.

Backward-linked supply chain effects or indirect contributions accounted for 23.1% or \$477.18 million of total economic contribution, 21% of employment contribution or 2,462 jobs, and 23.3% of labor income contribution or \$104.66 million. Household spending generated by labor income or induced economic contributions accounted for \$394.4 million or 19.1% of total economic contribution, 22.9% of employment contribution or 2,686 jobs, and 19.4% of labor income contributions or \$87.4 million.

Printing Industry Economic Contribution in Iowa				
	Direct Contribution	Indirect Contribution	Induced Contribution	Total Economic Contribution
Output (\$1,000s)	\$1,191,465.5	\$477,181.9	\$394,375.1	\$2,063,022.4
Employment	6,559	2,462	2,686	11,707
Labor Income (\$1,000s)	\$257,146.1	\$104,658.5	\$87,352.5	\$449,157.2
Value Added or GDP (\$1,000s)	\$559,988.8	\$119,146.5	\$235,791.0	\$914,926.3

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

The printing industry in Iowa generates \$914.93 million in Value Added, or GDP, annually through its direct economic impact and indirect/induced effects or approximately 0.55% of the state's \$165.77 billion total economic output. Compared to the overall national figures, the Iowa printing industry drives a slightly larger percent of GDP than other states. The national average is 0.51% of GDP.

The printing industry has a moderately strong relationship with other sectors of the economy in Iowa, leading to significant multipliers. For every additional \$1 in output, the printing industry generates an additional \$0.73 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 \$0.40 in backward-linked industries and \$0.33 in additional household spending. In Iowa, 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: real estate, rental, and leasing; health care and social assistance; finance and insurance; and retail trade. See the chart on the following page for further detail on print's indirect and induced impact on each industry.

Indirect and Induced Output Effects by Industry from Printing Industry Production, IOWA, 2013

		<u>Indirect</u>		<u>Induced</u>		<u>Indirect + Induced</u>	
Rank	Industry	(\$1,000s)	% of Total	(\$1,000s)	% of Total	(\$1,000s)	% of Total
1	Manufacturing	178,600.7	37.4%	36,816.3	9.3%	215,417.0	24.7%
2	Finance and insurance	37,650.3	7.9%	55,522.3	14.1%	93,172.6	10.7%
3	Real estate and rental and leasing	17,395.4	3.6%	68,271.0	17.3%	85,666.4	9.8%
4	Wholesale trade	62,551.9	13.1%	20,493.2	5.2%	83,045.1	9.5%
5	Health care and social assistance	238.3	0.0%	59,692.4	15.1%	59,930.7	6.9%
6	Retail trade	4,051.0	0.8%	44,799.1	11.4%	48,850.1	5.6%
7	Transportation and warehousing	37,292.9	7.8%	10,365.7	2.6%	47,658.6	5.5%
8	Administrative and waste management services	29,905.8	6.3%	6,314.8	1.6%	36,220.6	4.2%
9	Information	17,157.1	3.6%	14,893.3	3.8%	32,050.4	3.7%
10	Professional, scientific, and technical services	24,067.6	5.0%	7,506.2	1.9%	31,573.8	3.6%
11	Utilities	16,323.1	3.4%	10,484.9	2.7%	26,808.0	3.1%
12	Other services	8,221.1	1.7%	15,727.3	4.0%	23,948.5	2.7%
13	Food services and drinking places	6,314.8	1.3%	13,225.3	3.4%	19,540.0	2.2%
14	Management of companies and enterprises	17,038.0	3.6%	1,787.2	0.5%	18,825.2	2.2%
15	Agriculture, forestry, fishing, and hunting	3,812.7	0.8%	9,055.1	2.3%	12,867.8	1.5%
16	Construction	9,055.1	1.9%	2,025.5	0.5%	11,080.6	1.3%
17	Educational services	834.0	0.2%	10,008.3	2.5%	10,842.3	1.2%
18	Accommodation	5,480.7	1.1%	4,170.1	1.1%	9,650.9	1.1%
19	Arts, entertainment, and recreation	1,072.3	0.2%	2,978.7	0.8%	4,051.0	0.5%
20	Mining	238.3	0.0%	119.1	0.0%	357.4	0.0%
Total		477,301.1	100.0%	394,255.9	100.0%	871,557.0	100.0%

Sources: BEA RIMS II Multipliers, Census Bureau County Business Patterns, and PIA Print Market Atlas

Note: Total direct output contributions from printing industry production in Iowa were \$1.191 billion in 2013. Total Economic Contributions were \$2.063 billion.

Every additional job in the Iowa printing industry supports an additional 0.38 non-print jobs due to inter-industry effects and 0.41 jobs due to additional household spending or an additional 0.78 jobs. The printing industry has a strong inter-industry relationship with other manufactures—51.3% 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. For each job directly supported by the printing industry in Iowa, the average labor income per job is \$39,204, and the indirect labor income per job is \$42,516.

Induced employment contributions are based on additional household spending cycling through the economy. The sectors of the Iowa economy that are most affected by the induced employment contribution include health care and social assistance (20.2%); retail trade (18.6%); and real estate, rental, and leasing (8.7%). Each job directly generated by the printing industry results in 0.41 being supported through induced employment contributions. The induced jobs are lower paying on average because they are in industries with lower wages. The average labor income for these jobs is \$32,522 in Iowa. See chart below for further detail on print's indirect and induced impact on each industry's employment.

Indirect and Induced Employment Effects by Industry from Printing Industry Production, IOWA, 2013

Rank	Industry	<u>Indirect</u>		<u>Induced</u>		<u>Indirect + Induced</u>	
		Jobs	% of Total	Jobs	% of Total	Jobs	% of Total
1	Manufacturing	1,264	51.3%	106	3.9%	1,369	26.6%
2	Health care and social assistance	1	0.1%	542	20.2%	544	10.6%
3	Retail trade	28	1.1%	499	18.6%	527	10.2%
4	Administrative and waste management services	286	11.6%	94	3.5%	379	7.4%
5	Real estate and rental and leasing	42	1.7%	234	8.7%	276	5.4%
6	Food services and drinking places	62	2.5%	209	7.8%	271	5.3%
7	Wholesale trade	169	6.9%	89	3.3%	258	5.0%
8	Finance and insurance	72	2.9%	183	6.8%	256	5.0%
9	Other services	60	2.5%	186	6.9%	247	4.8%
10	Transportation and warehousing	148	6.0%	67	2.5%	215	4.2%
11	Professional, scientific, and technical services	120	4.9%	60	2.2%	180	3.5%
12	Educational services	9	0.4%	166	6.2%	174	3.4%
13	Information	35	1.4%	50	1.9%	85	1.7%
14	Accommodation	34	1.4%	41	1.5%	75	1.5%
15	Management of companies and enterprises	54	2.2%	9	0.3%	63	1.2%
16	Construction	43	1.8%	16	0.6%	59	1.1%
17	Arts, entertainment, and recreation	9	0.4%	41	1.5%	50	1.0%
18	Agriculture, forestry, fishing, and hunting	9	0.4%	35	1.3%	44	0.9%
19	Households	0	0.0%	39	1.5%	39	0.8%
20	Utilities	17	0.7%	18	0.7%	35	0.7%
21	Mining	0	0.0%	1	0.0%	1	0.0%
Total		2,462	100.0%	2,686	100.0%	5,148	100.0%

Sources: BEA RIMS II Multipliers, Census Bureau County Business Patterns, and PIA Print Market Atlas

Note: Total direct employment contributions from printing industry production in Iowa were 6,559 jobs in 2013. Total Economic Employment Contributions were 11,707 jobs.

The

The Iowa economy generated \$165.77 billion Gross Domestic Product (GDP) in 2013 or approximately 0.95% of total U.S. output and 24% PIM total output. The largest industries in terms of percent of GDP in Iowa are manufacturing (17.1%); real estate, rental, and leasing (10.4%); finance and insurance (10.2%); and agriculture, forestry, fishing, and hunting (9.7%). We do not include government in the list above (11.2% 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 on the following page, the industries

that are driving the most growth in 2013 include agriculture, forestry, fishing, and hunting (increased 37.7% adding 2.8% to total Iowa output or 48% share of growth); finance and insurance (increased 6.0% adding 0.6% to total Iowa output or 10.4% share of growth); and manufacturing (increased 2.6% adding 0.5% to total Iowa output or 7.8% share of growth). See table below for the complete breakdown by industry.

Gross Domestic Product by Industry in Iowa (millions of current dollars)							
Industry	GDP (millions of current dollars)		Percent Change 2012 to 2013	Share of Growth	Contribution to Change in Output	Percent Share of State Output	
	2012	2013				2012	2013
Manufacturing	27,705	28,416	2.6%	7.8%	0.5%	17.7%	17.1%
Real estate and rental and leasing	16,813	17,182	2.2%	4.0%	0.2%	10.7%	10.4%
Finance and insurance	15,915	16,871	6.0%	10.4%	0.6%	10.2%	10.2%
Agriculture, forestry, fishing, and hunting	11,663	16,058	37.7%	48.0%	2.8%	7.4%	9.7%
Health care and social assistance	10,187	10,649	4.5%	5.0%	0.3%	6.5%	6.4%
Wholesale trade	9,598	10,066	4.9%	5.1%	0.3%	6.1%	6.1%
Retail trade	8,967	9,219	2.8%	2.8%	0.2%	5.7%	5.6%
Construction	6,078	6,459	6.3%	4.2%	0.2%	3.9%	3.9%
Transportation and warehousing	5,253	5,467	4.1%	2.3%	0.1%	3.4%	3.3%
Professional, scientific, and technical services	4,819	5,048	4.8%	2.5%	0.1%	3.1%	3.0%
Information	4,107	4,177	1.7%	0.8%	0.0%	2.6%	2.5%
Accommodation and food services	3,229	3,403	5.4%	1.9%	0.1%	2.1%	2.1%
Other services, except government	3,233	3,328	2.9%	1.0%	0.1%	2.1%	2.0%
Administrative and waste management services	3,277	3,317	1.2%	0.4%	0.0%	2.1%	2.0%
Utilities	2,663	2,789	4.7%	1.4%	0.1%	1.7%	1.7%
Management of companies and enterprises	1,781	1,834	3.0%	0.6%	0.0%	1.1%	1.1%
Educational services	1,453	1,488	2.4%	0.4%	0.0%	0.9%	0.9%
Arts, entertainment, and recreation	1,140	1,043	-8.5%	-1.1%	-0.1%	0.7%	0.6%
Mining	486	432	-11.1%	-0.6%	0.0%	0.3%	0.3%
Government	18,239	18,521	1.5%	3.1%	0.2%	11.6%	11.2%
All industry total	156,606	165,767	5.8%	100.0%	5.8%	100.0%	100.0%

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 17.1% of total economic output in the Iowa economy or it is the largest industry. Almost 25% of the printing industry’s indirect and induced contributions to the regional economy are circulated through the manufacturing industry. In fact, the three largest industries in Iowa are also the three highest ranked in terms of percent of printing industry indirect and induced contribution to the regional economy. The fourth largest industry in the region, agriculture, forestry, fishing and hunting, breaks this trend. It is a large industry in the region (9.7% of total regional output), but has little inter-relationship with the printing industry (1.5% of indirect/induced economic contribution). The printing industry does not have much in terms of backward-linked supply chain effects or indirect economic contributions or household spending generated by labor income with agriculture, forestry, fishing, and hunting. See the chart below 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.

Top Iowa Industries Compared to Industries' Indirect and Induced Relationship with the Printing Industry				
Overall Industry Rank in Terms of Output in Iowa	Industry	Percent of Iowa Regional GDP by Industry	Printing Industry Indirect and Induced Output % of Total	Industries Ranked by Percent of Indirect and Induced Output Generated Via Print Contributions
1	Manufacturing	17.14%	24.7%	1
2	Real estate and rental and leasing	10.37%	9.8%	3
3	Finance and insurance	10.18%	10.7%	2
4	Agriculture, forestry, fishing, and hunting	9.69%	1.5%	15
5	Health care and social assistance	6.42%	6.9%	5
6	Wholesale trade	6.07%	9.5%	4
7	Retail trade	5.56%	5.6%	6
8	Construction	3.90%	1.3%	16
9	Transportation and warehousing	3.30%	5.5%	7
10	Professional, scientific, and technical services	3.05%	3.6%	10
11	Information	2.52%	3.7%	9
12	Accommodation and food services	2.05%	3.3%	11
13	Other services, except government	2.01%	2.7%	13
14	Administrative and waste management services	2.00%	4.2%	8
15	Utilities	1.68%	3.1%	12
16	Management of companies and enterprises	1.11%	2.2%	14
17	Educational services	0.90%	1.2%	17
18	Arts, entertainment, and recreation	0.63%	0.5%	18
19	Mining	0.26%	0.0%	19

Federal, state, and local tax revenues generated by the Iowa printing industry totaled \$136.55 million. The printing industry added \$559.98 million in direct value added output to Iowa's gross domestic product and 24.4% of this output was collected by the federal, state, and local governments in taxes. The main source of federal tax revenues was individual income taxes (47%) and social security taxes (33%). More than 7% of Iowa printing industry revenues or \$39.6 million were collected to help fund the state and local governments. Property taxes (40%) and individual income taxes (24.5%) were the two main sources of revenue for state and local governments.

2013 Federal, State and Local Taxes Generated by the Printing Industry in Iowa	
Type of Tax	Taxes Collected (\$ Millions)
Federal Taxes	
Individual income tax	\$45.40
Corporate income tax	\$11.61
Social security taxes	\$32.03
Excise taxes	\$2.94
Other taxes	\$4.94
Total Federal Taxes	\$96.92
Type of Tax	Taxes Collected (\$ Millions)
State Taxes and Local	
Individual income tax	\$9.69
Corporate income tax	\$1.45
Sales or Use Tax	\$6.87
Excise taxes	\$2.87
Property Taxes	\$15.90
Other taxes	\$1.85
License Taxes	\$1.85
Total State and Local Taxes	\$39.63
Total Fiscal Contribution	\$136.55

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

Over the next two years we will continue to track the inter-relationships between the printing industry and other industries within the state. As various industries continue to grow at above-average rates such as agriculture, construction, and finance, we will monitor how their indirect and induced relationships change with the printing industry. As various industries continue to

decline in terms of output or grow at below-average rates like mining, arts/entertainment, and administrative and waste management services, we will monitor how their indirect and induced relationships change with the printing industry. Knowing the change in output and the relationship various industries have with our industry is helpful to Iowa printers that currently service a sector that is either in growth or decline to better forecast demand. It also helps suppliers, association executives, policy makers, and other stakeholders better understand how changes in the printing industry will affect other industries.

Minnesota: Printing Industry Economic Contribution



In 2013 the printing industry directly contributed \$4.14 billion in output, 22,771 jobs, and \$1.09 billion in labor income to Minnesota’s economy. After calculating backward-linked supply chain effects or indirect economic contributions and household spending generated by labor income or induced economic contributions, these values increased significantly. Total economic contributions to the Minnesota economy amounted to \$9.41 billion in output, \$4.39 billion in Value-Added (GDP), 55,186 jobs, and \$2.47 billion in labor income.

Backward-linked supply chain effects or indirect contributions accounted for 30.4% or \$2.86 billion of total economic contribution, 25.9% of employment contribution or 14,312 jobs, and 29.7% of labor income contribution or \$732.4 million. Household spending generated by labor income or induced economic contributions accounted for \$2.41 billion or 25.6% of total economic contribution, 32.8% of employment contribution or 18,103 jobs, and 26.1% of labor income contributions or \$645.6 million.

Printing Industry Economic Contribution in Minnesota				
	Direct Contribution	Indirect Contribution	Induced Contribution	Total Economic Contribution
Output (\$1,000s)	\$4,136,395.0	\$2,860,317.1	\$2,409,036.4	\$9,405,748.5
Employment	22,771	14,312	18,103	55,186
Labor Income (\$1,000s)	\$1,091,018.4	\$732,400.7	\$645,555.6	\$2,468,974.7
Value Added or GDP (\$1,000s)	\$1,944,105.6	\$1,030,789.6	\$1,419,610.8	\$4,394,506.0

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

The printing industry in Minnesota generates \$4.39 billion in Value-Added, or GDP, annually through its direct economic impact and indirect/induced effects or approximately 1.41% of the state's \$312.08 billion total economic output. Compared to the overall national figures, the Minnesota printing industry drives a 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 and 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. See the chart on the following page for further detail on print's indirect and induced impact on each industry.

Indirect and Induced Output Effects by Industry from Printing Industry Production, MINNESOTA, 2013

Rank	Industry	Indirect		Induced		Indirect + Induced	
		(\$1,000s)	% of Total	(\$1,000s)	% of Total	(\$1,000s)	% of Total
1	Manufacturing	1,170,599.8	40.9%	262,247.4	10.9%	1,432,847.2	27.2%
2	Real estate and rental and leasing	170,419.5	6.0%	425,635.0	17.7%	596,054.5	11.3%
3	Finance and insurance	170,005.8	5.9%	316,847.9	13.2%	486,853.7	9.2%
4	Wholesale trade	303,611.4	10.6%	126,987.3	5.3%	430,598.7	8.2%
5	Health care and social assistance	1,654.6	0.1%	343,734.4	14.3%	345,389.0	6.6%
6	Professional, scientific, and technical services	234,947.2	8.2%	93,896.2	3.9%	328,843.4	6.2%
7	Retail trade	16,545.6	0.6%	213,024.3	8.8%	229,569.9	4.4%
8	Transportation and warehousing	158,010.3	5.5%	71,559.6	3.0%	229,569.9	4.4%
9	Management of companies and enterprises	169,178.6	5.9%	27,713.8	1.2%	196,892.4	3.7%
10	Information	92,241.6	3.2%	94,723.4	3.9%	186,965.1	3.5%
11	Administrative and waste management services	132,778.3	4.6%	47,568.5	2.0%	180,346.8	3.4%
12	Utilities	75,696.0	2.6%	55,841.3	2.3%	131,537.4	2.5%
13	Other services	34,332.1	1.2%	95,964.4	4.0%	130,296.4	2.5%
14	Food services and drinking places	32,263.9	1.1%	81,073.3	3.4%	113,337.2	2.2%
15	Agriculture, forestry, fishing, and hunting	19,441.1	0.7%	43,432.1	1.8%	62,873.2	1.2%
16	Construction	37,227.6	1.3%	11,995.5	0.5%	49,223.1	0.9%
17	Accommodation	24,404.7	0.9%	24,404.7	1.0%	48,809.5	0.9%
18	Educational services	2,895.5	0.1%	41,777.6	1.7%	44,673.1	0.8%
19	Arts, entertainment, and recreation	12,822.8	0.4%	28,954.8	1.2%	41,777.6	0.8%
20	Mining	2,068.2	0.1%	827.3	0.0%	2,895.5	0.1%
Total		2,861,144.4	100.0%	2,408,209.2	100.0%	5,269,353.6	100.0%

Sources: BEA RIMS II Multipliers, Census Bureau County Business Patterns, and PIA Print Market Atlas

Note: Total direct output contributions from printing industry production in Minnesota were \$4.136 billion in 2013. Total Economic Contributions were \$9.406 billion.

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 manufactures—32.3% 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. For each job directly supported by the printing industry in Minnesota, the average labor income per job is \$47,912, and the indirect labor income per job is \$51,175.

Induced employment contributions are based on additional household spending cycling through the economy. The sectors of the Minnesota economy that are most affected by the induced employment contribution 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 induced jobs are lower paying on average because they are in industries with lower wages. The average labor income for these jobs is \$35,660 in Minnesota. See chart on the following page for further detail on print’s indirect and induced impact on each industry’s employment.

Indirect and Induced Employment Effects by Industry from Printing Industry Production, MINNESOTA, 2013

		<u>Indirect</u>		<u>Induced</u>		<u>Indirect + Induced</u>	
Rank	Industry	Jobs	% of Total	Jobs	% of Total	Jobs	% of Total
1	Manufacturing	4,624	32.3%	790	4.4%	5,414	16.7%
2	Health care and social assistance	11	0.1%	3,345	18.5%	3,356	10.4%
3	Retail trade	196	1.4%	2,888	16.0%	3,084	9.5%
4	Administrative and waste management services	2,057	14.4%	805	4.4%	2,862	8.8%
5	Real estate and rental and leasing	585	4.1%	1,968	10.9%	2,553	7.9%
6	Professional, scientific, and technical services	1,491	10.4%	676	3.7%	2,167	6.7%
7	Food services and drinking places	524	3.7%	1,500	8.3%	2,024	6.2%
8	Finance and insurance	571	4.0%	1,248	6.9%	1,819	5.6%
9	Other services	390	2.7%	1,236	6.8%	1,625	5.0%
10	Wholesale trade	1,074	7.5%	509	2.8%	1,583	4.9%
11	Transportation and warehousing	982	6.9%	506	2.8%	1,488	4.6%
12	Educational services	44	0.3%	748	4.1%	792	2.4%
13	Arts, entertainment, and recreation	193	1.3%	533	2.9%	726	2.2%
14	Management of companies and enterprises	569	4.0%	105	0.6%	674	2.1%
15	Information	238	1.7%	282	1.6%	520	1.6%
16	Accommodation	236	1.6%	265	1.5%	501	1.5%
17	Construction	285	2.0%	104	0.6%	389	1.2%
18	Agriculture, forestry, fishing, and hunting	118	0.8%	193	1.1%	312	1.0%
19	Households	0	0.0%	300	1.7%	300	0.9%
20	Utilities	121	0.8%	100	0.6%	221	0.7%
21	Mining	4	0.0%	2	0.0%	6	0.0%
Total		14,312	100.0%	18,103	100.0%	32,415	100.0%

Sources: BEA RIMS Multipliers, Census Bureau County Business Patterns, and PIA Print Market Atlas

Note: Total direct employment contributions from printing industry production in Minnesota were 22,771 jobs in 2013. Total Economic Employment Contributions were 55,186 jobs.

The Minnesota economy generated \$312.08 billion Gross Domestic Product (GDP) in 2013 or approximately 1.79% of total U.S. output and 45.2% PIM total output. The largest industries in terms of percent of GDP in the Minnesota are manufacturing (14.0%); real estate, rental, and leasing (12.7%); health care and social assistance (8.6%); finance and insurance (7.1%); and wholesale trade (6.9%). We do not include government in the list above (9.8% 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 on the following page, the industries that are driving the most growth in 2013 include agriculture, forestry, fishing, and hunting (increased 36.5% adding 1.3% to total Minnesota output or 27.2% share of growth); real estate and rental and leasing (increased 4.8% adding 0.6% to total output or 13.3% share of growth); and health care and social assistance (increased 3.8% adding 0.3% to total output or 7.2% share of growth). See table on the following page for the complete breakdown by industry.

Gross Domestic Product by Industry in Minnesota
(millions of current dollars)

Industry	GDP (millions of current dollars)		Percent Change 2012 to 2013	Share of Growth	Contribution to Change in Output	Percent Share of State Output	
	2012	2013				2012	2013
Manufacturing	42,796	43,743	2.2%	6.9%	0.3%	14.3%	14.0%
Real estate and rental and leasing	37,909	39,745	4.8%	13.3%	0.6%	12.7%	12.7%
Health care and social assistance	25,867	26,857	3.8%	7.2%	0.3%	8.7%	8.6%
Finance and insurance	21,249	22,227	4.6%	7.1%	0.3%	7.1%	7.1%
Wholesale trade	20,741	21,680	4.5%	6.8%	0.3%	7.0%	6.9%
Professional, scientific, and technical services	17,390	18,154	4.4%	5.5%	0.3%	5.8%	5.8%
Retail trade	15,642	16,249	3.9%	4.4%	0.2%	5.2%	5.2%
Agriculture, forestry, fishing, and hunting	10,305	14,066	36.5%	27.2%	1.3%	3.5%	4.5%
Construction	11,515	12,357	7.3%	6.1%	0.3%	3.9%	4.0%
Management of companies and enterprises	11,490	12,168	5.9%	4.9%	0.2%	3.9%	3.9%
Information	10,814	10,847	0.3%	0.2%	0.0%	3.6%	3.5%
Transportation and warehousing	8,185	8,413	2.8%	1.7%	0.1%	2.7%	2.7%
Administrative and waste management services	7,335	7,333	0.0%	0.0%	0.0%	2.5%	2.3%
Accommodation and food services	6,657	6,903	3.7%	1.8%	0.1%	2.2%	2.2%
Other services, except government	6,165	6,323	2.6%	1.1%	0.1%	2.1%	2.0%
Utilities	5,346	5,771	7.9%	3.1%	0.1%	1.8%	1.8%
Educational services	3,001	3,037	1.2%	0.3%	0.0%	1.0%	1.0%
Arts, entertainment, and recreation	2,826	2,907	2.9%	0.6%	0.0%	0.9%	0.9%
Mining	2,704	2,701	-0.1%	0.0%	0.0%	0.9%	0.9%
Government	30,335	30,600	0.9%	1.9%	0.1%	10.2%	9.8%
All industry total	298,272	312,081	4.6%	100.0%	4.6%	100.0%	100.0%

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.

For example: manufacturing accounts for 14.2% of total economic output in Minnesota or 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 chart below 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.

Top Minnesota Industries Compared to Industries' Indirect and Induced Relationship with the Printing Industry				
Overall Industry Rank in Terms of Output in MN	Industry	Percent of MN Regional GDP by Industry	Printing Industry Indirect and Induced Output % of Total	Industries Ranked by Percent of Indirect and Induced Output Generated Via Print Contributions
1	Manufacturing	14.02%	27.2%	1
2	Real estate and rental and leasing	12.74%	11.3%	2
3	Health care and social assistance	8.61%	6.6%	5
4	Finance and insurance	7.12%	9.2%	3
5	Wholesale trade	6.95%	8.2%	4
6	Professional, scientific, and technical services	5.82%	6.2%	6
7	Retail trade	5.21%	4.4%	7
8	Agriculture, forestry, fishing, and hunting	4.51%	1.2%	15
9	Construction	3.96%	0.9%	16
10	Management of companies and enterprises	3.90%	3.7%	9
11	Information	3.48%	3.5%	10
12	Transportation and warehousing	2.70%	4.4%	8
13	Administrative and waste management services	2.35%	3.4%	11
14	Accommodation and food services	2.21%	3.1%	12
15	Other services, except government	2.03%	2.5%	14
16	Utilities	1.85%	2.5%	13
17	Educational services	0.97%	0.8%	17
18	Arts, entertainment, and recreation	0.93%	0.8%	18
19	Mining	0.87%	0.1%	19

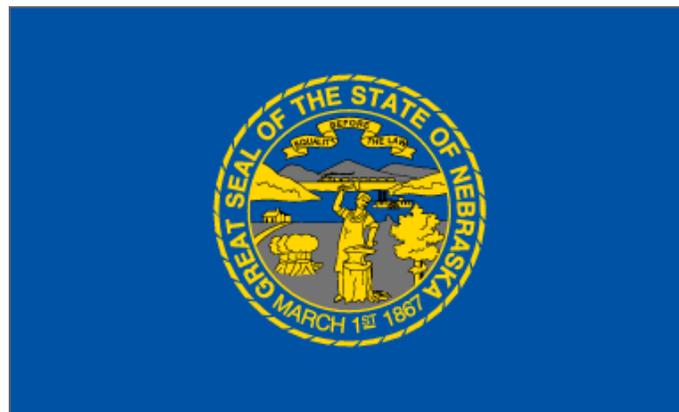
Federal, state, and local tax revenues generated by the Minnesota printing industry totaled over \$500 million. The printing industry added \$1.94 billion in direct value-added output to Minnesota's gross domestic product and 25.8% of this output was collected by the federal, state, and local governments in taxes. The main source of federal tax revenues was individual income taxes (47%) and social security taxes (33%). Almost 9% of Minnesota's printing industry revenues or \$165.97 million were collected to help fund the state and local governments. Property taxes (33%) and individual income taxes (32%) were the two main sources of revenue for state and local governments.

2013 Federal, State and Local Taxes Generated by the Printing Industry in Minnesota	
Type of Tax	Taxes Collected (\$ Millions)
Federal Taxes	
Individual income tax	\$157.60
Corporate income tax	\$40.31
Social security taxes	\$111.20
Excise taxes	\$10.21
Other taxes	\$17.14
Total Federal Taxes	\$336.46
Type of Tax	Taxes Collected (\$ Millions)
State Taxes and Local	
Individual income tax	\$52.55
Corporate income tax	\$8.49
Sales or Use Tax	\$21.50
Excise taxes	\$18.60
Property Taxes	\$54.89
Other taxes	\$6.43
License Taxes	\$6.43
Total State and Local Taxes	\$165.97
Total Fiscal Contribution	\$502.43

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

Over the next two years we will continue to track the inter-relationships between the printing industry and other industries within the state. As various industries continue to grow at above-average rates such as agriculture, utilities, construction, and real estate, we will monitor how their indirect and induced relationships change with the printing industry. As various industries continue to decline in terms of output or grow at below-average rates like mining, information, and administrative and waste management services, we will monitor how their indirect and induced relationships change with the printing industry. Knowing the change in output and the relationship various industries have with our industry is helpful to Minnesota printers that currently service a sector that is either in growth or decline to better forecast demand. It also helps suppliers, association executives, policy makers, and other stakeholders better understand how changes in the printing industry will affect other industries.

Nebraska: Printing Industry Economic Contribution



In 2013 the printing industry directly contributed \$523.2 million in output, 2,880 jobs, and \$111.8 million in labor income to Nebraska’s economy. After calculating backward-linked supply chain effects or indirect economic contributions and household spending generated by labor income or induced economic contributions, these values increased significantly. Total economic contributions to the Nebraska economy amounted to \$858.2 million in output, \$384.8 million in Value-Added (GDP), 5,047 jobs, and \$189.9 million in labor income.

Backward-linked supply chain effects or indirect contributions accounted for 20.8% or \$178.5 million of total economic contribution, 20.3% of employment contribution or 1,024 jobs, and 22.5% of labor income contribution or \$42.8 million. Household spending generated by labor income or induced economic contributions accounted for \$156.5 million or 18.2% of total economic contribution, 22.6% of employment contribution or 1,143 jobs, and 18.6% of labor income contributions or \$35.3 million.

Printing Industry Economic Contribution in Nebraska				
	Direct Contribution	Indirect Contribution	Induced Contribution	Total Economic Contribution
Output (\$1,000s)	\$523,190.9	\$178,460.4	\$156,538.7	\$858,190.1
Employment	2,880	1,024	1,143	5,047
Labor Income (\$1,000s)	\$111,776.0	\$42,787.8	\$35,287.7	\$189,851.5
Value Added or GDP (\$1,000s)	\$245,899.7	\$43,895.7	\$95,011.5	\$384,806.9

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

The printing industry in Nebraska generates \$384.8 million in Value-Added, or GDP, annually through its direct economic impact and indirect/induced effects or approximately 0.35% of the state's \$109.6 billion total economic output. Compared to the overall national figures, the Nebraska printing industry drives a smaller percent of GDP than other states. The national average is 0.49% of GDP.

The printing industry has a weaker relationship with other sectors of the economy in Nebraska compared to other states in the PIM region, leading to smaller multipliers. For every additional \$1 in output, the printing industry generates an additional \$0.64 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 \$0.34 in backward-linked industries and \$0.29 in additional household spending. In Nebraska, the backward-linked industries the printing industry has the strongest relationship with include manufacturing; wholesale trade; professional, scientific, and technical services; finance and insurance; management of companies and enterprises; and transportation and warehousing. 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; retail trade; and manufacturing. See the chart on the following page for further detail on print's indirect and induced impact on each industry.

Indirect and Induced Output Effects by Industry from Printing Industry Production, NEBRASKA, 2013

Rank	Industry	Indirect		Induced		Indirect + Induced	
		(\$1,000s)	% of Total	(\$1,000s)	% of Total	(\$1,000s)	% of Total
1	Manufacturing	41,384.4	23.2%	10,934.7	7.0%	52,319.1	15.6%
2	Real estate and rental and leasing	8,789.6	4.9%	29,089.4	18.6%	37,879.0	11.3%
3	Finance and insurance	15,224.9	8.5%	21,607.8	13.8%	36,832.6	11.0%
4	Wholesale trade	23,386.6	13.1%	7,429.3	4.7%	30,815.9	9.2%
5	Health care and social assistance	104.6	0.1%	24,328.4	15.5%	24,433.0	7.3%
6	Professional, scientific, and technical services	17,213.0	9.7%	4,394.8	2.8%	21,607.8	6.5%
7	Retail trade	1,569.6	0.9%	17,422.3	11.1%	18,991.8	5.7%
8	Transportation and warehousing	14,754.0	8.3%	3,976.3	2.5%	18,730.2	5.6%
9	Management of companies and enterprises	15,172.5	8.5%	1,464.9	0.9%	16,637.5	5.0%
10	Utilities	8,894.2	5.0%	5,231.9	3.3%	14,126.2	4.2%
11	Administrative and waste management services	11,144.0	6.2%	2,563.6	1.6%	13,707.6	4.1%
12	Information	7,533.9	4.2%	4,708.7	3.0%	12,242.7	3.7%
13	Other services	3,819.3	2.1%	7,586.3	4.8%	11,405.6	3.4%
14	Food services and drinking places	2,877.5	1.6%	5,650.5	3.6%	8,528.0	2.5%
15	Construction	3,557.7	2.0%	784.8	0.5%	4,342.5	1.3%
16	Agriculture, forestry, fishing, and hunting	575.5	0.3%	3,505.4	2.2%	4,080.9	1.2%
17	Educational services	313.9	0.2%	3,610.0	2.3%	3,923.9	1.2%
18	Accommodation	1,360.3	0.8%	994.1	0.6%	2,354.4	0.7%
19	Arts, entertainment, and recreation	627.8	0.4%	1,203.3	0.8%	1,831.2	0.5%
20	Mining	52.3	0.0%	104.6	0.1%	157.0	0.0%
Total		178,355.8	100.0%	156,591.0	100.0%	334,946.8	100.0%

Sources: BEA RIMS Multipliers, Census Bureau County Business Patterns, and PIA Print Market Atlas

Note: Total direct output contributions from printing industry production in Nebraska were \$523.1 million in 2013. Total Economic Contributions were \$858.19 million.

Every additional job in the Nebraska printing industry supports an additional 0.75 non-print jobs, inter-industry effects support 0.35 jobs and additional household spending 0.40 jobs. The printing industry has a strong inter-industry relationship with other manufactures—42.8% 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. For each job directly supported by the printing industry in Nebraska, the average labor income per job is \$38,808, and the indirect labor income per job is \$41,788.

Induced employment contributions are based on additional household spending cycling through the economy. The sectors of the Nebraska economy that are most affected by the induced employment contribution include health care and social assistance (20.4%); retail trade (18.4%); and real estate, rental, and leasing (9.4%). Each job directly generated by the printing industry results in 0.40 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 average labor income for these jobs is \$30,884 in Nebraska. See chart on the following page for further detail on print’s indirect and induced impact on each industry’s employment.

Indirect and Induced Employment Effects by Industry from Printing Industry Production, NEBRASKA, 2013

		<u>Indirect</u>		<u>Induced</u>		<u>Indirect + Induced</u>	
Rank	Industry	Jobs	% of Total	Jobs	% of Total	Jobs	% of Total
1	Manufacturing	439	42.8%	34	3.0%	473	21.8%
2	Health care and social assistance	1	0.1%	233	20.4%	234	10.8%
3	Retail trade	12	1.2%	210	18.4%	222	10.3%
4	Administrative and waste management services	122	11.9%	41	3.5%	162	7.5%
5	Finance and insurance	39	3.8%	91	8.0%	131	6.0%
6	Food services and drinking places	33	3.2%	97	8.5%	130	6.0%
7	Real estate and rental and leasing	19	1.9%	107	9.4%	126	5.8%
8	Professional, scientific, and technical services	84	8.2%	32	2.8%	116	5.3%
9	Other services	28	2.7%	83	7.2%	110	5.1%
10	Wholesale trade	73	7.1%	35	3.0%	108	5.0%
11	Transportation and warehousing	64	6.2%	25	2.2%	89	4.1%
12	Educational services	3	0.3%	57	5.0%	60	2.8%
13	Management of companies and enterprises	47	4.6%	7	0.6%	54	2.5%
14	Information	17	1.7%	16	1.4%	33	1.5%
15	Arts, entertainment, and recreation	7	0.7%	22	1.9%	29	1.4%
16	Construction	17	1.7%	6	0.5%	23	1.1%
17	Accommodation	10	1.0%	10	0.9%	20	0.9%
18	Households	0	0.0%	17	1.5%	17	0.8%
19	Utilities	8	0.7%	7	0.6%	14	0.7%
20	Agriculture, forestry, fishing, and hunting	1	0.1%	13	1.1%	14	0.7%
21	Mining	0	0.0%	0	0.0%	0	0.0%
Total		1,024	100.0%	1,143	100.0%	2,167	100.0%

Sources: BEA RIMS Multipliers, Census Bureau County Business Patterns, and PIA Print Market Atlas

Note: Total direct employment contributions from printing industry production in Nebraska were 2,880 jobs in 2013. Total Economic Employment Contributions were 5,047 jobs.

The Nebraska economy generated \$109.61 billion of Gross Domestic Product (GDP) in 2013 or approximately 0.63% of total U.S. output and 15.87% of PIM total output. Output increased by 6.4% in 2013 with the agricultural and transportation sectors driving over 50% of the growth. The largest industries in terms of percent of GDP in the Nebraska are manufacturing (12.7%); agriculture, forestry, fishing, and hunting (10.4%); real estate and rental and leasing (9.5%); finance and insurance (7.6%); and transportation and warehousing (7.1%). We do not include government in the list above (12.3% 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 on the following page, the industries that are driving the most growth in 2013 include agriculture, forestry, fishing, and hunting (increased 35.2% adding 2.9% to total Nebraska output or 45.5% share of growth); management of companies and enterprises (increased 28.9% adding 0.6% to total output or 9.4% share of growth); and real estate and rental and leasing (increased 4.9% adding 0.5% to total output or 7.4% share of growth). See table on the following page for the complete breakdown by industry.

Gross Domestic Product by Industry in Nebraska (millions of current dollars)							
Industry	GDP (millions of current dollars)		Percent Change 2012 to 2013	Share of Growth	Contribution to Change in Output	Percent Share of State Output	
	2012	2013				2012	2013
Manufacturing	13,568	13,960	2.9%	6.0%	0.4%	13.2%	12.7%
Agriculture, forestry, fishing, and hunting	8,451	11,429	35.2%	45.5%	2.9%	8.2%	10.4%
Real estate and rental and leasing	9,942	10,426	4.9%	7.4%	0.5%	9.6%	9.5%
Finance and insurance	7,940	8,380	5.5%	6.7%	0.4%	7.7%	7.6%
Transportation and warehousing	7,467	7,828	4.8%	5.5%	0.4%	7.2%	7.1%
Health care and social assistance	7,103	7,397	4.1%	4.5%	0.3%	6.9%	6.7%
Wholesale trade	5,690	5,994	5.3%	4.6%	0.3%	5.5%	5.5%
Retail trade	5,656	5,833	3.1%	2.7%	0.2%	5.5%	5.3%
Construction	4,320	4,604	6.6%	4.3%	0.3%	4.2%	4.2%
Professional, scientific, and technical services	4,637	4,534	-2.2%	-1.6%	-0.1%	4.5%	4.1%
Management of companies and enterprises	2,136	2,753	28.9%	9.4%	0.6%	2.1%	2.5%
Information	2,564	2,629	2.5%	1.0%	0.1%	2.5%	2.4%
Administrative and waste management services	2,339	2,487	6.3%	2.3%	0.1%	2.3%	2.3%
Other services, except government	2,173	2,228	2.5%	0.8%	0.1%	2.1%	2.0%
Accommodation and food services	2,030	2,101	3.5%	1.1%	0.1%	2.0%	1.9%
Utilities	1,899	1,782	-6.2%	-1.8%	-0.1%	1.8%	1.6%
Educational services	855	826	-3.4%	-0.4%	0.0%	0.8%	0.8%
Arts, entertainment, and recreation	525	556	5.9%	0.5%	0.0%	0.5%	0.5%
Mining	442	386	-12.7%	-0.9%	-0.1%	0.4%	0.4%
Government	13,326	13,481	1.2%	2.4%	0.2%	12.9%	12.3%
All industry total	103,063	109,614	6.4%	100.0%	6.4%	100.0%	100.0%

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.

For example: manufacturing accounts for 12.7% of total economic output in Nebraska or it is the largest industry. Almost 16% of the printing industry's indirect and induced contributions to the regional economy are circulated through the manufacturing industry. This trend of the larger the industry the greater the inter-relationship with the printing industry is consistent with most industries in the state except for agriculture, forestry, fishing, and hunting (second largest

industry in the state but ranked 16th in terms of strength of relationship with the printing industry) and construction (ninth largest industry in the state but ranked 15th in terms of strength of relationship with the printing industry). See the chart below 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.

Top Nebraska Industries Compared to Industries' Indirect and Induced Relationship with the Printing Industry				
Overall Industry Rank in Terms of Output in NE	Industry	Percent of NE Regional GDP by Industry	Printing Industry Indirect and Induced Output % of Total	Industries Ranked by Percent of Indirect and Induced Output Generated Via Print Contributions
1	Manufacturing	12.74%	15.6%	1
2	Agriculture, forestry, fishing, and hunting	10.43%	1.2%	16
3	Real estate and rental and leasing	9.51%	11.3%	2
4	Finance and insurance	7.65%	11.0%	3
5	Transportation and warehousing	7.14%	5.6%	8
6	Health care and social assistance	6.75%	7.3%	5
7	Wholesale trade	5.47%	9.2%	4
8	Retail trade	5.32%	5.7%	7
9	Construction	4.20%	1.3%	15
10	Professional, scientific, and technical services	4.14%	6.5%	6
11	Management of companies and enterprises	2.51%	5.0%	9
12	Information	2.40%	3.7%	12
13	Administrative and waste management services	2.27%	4.1%	11
14	Other services, except government	2.03%	3.4%	13
15	Accommodation and food services	1.92%	3.2%	14
16	Utilities	1.63%	4.2%	10
17	Educational services	0.75%	1.2%	17
18	Arts, entertainment, and recreation	0.51%	0.5%	18
19	Mining	0.35%	0.0%	19

Federal, state, and local tax revenues generated by the Nebraska printing industry totaled \$59.76 million. The printing industry added \$246 million in direct value-added output to Nebraska's gross domestic product and 24.3% of this output was collected by the federal, state, and local governments in taxes. The main source of federal tax revenues was individual income taxes and social security taxes. Nebraska's printing industry revenues generated \$165.97 million in revenue for the state and local governments. Property taxes (43% of state and local collections) and individual income taxes (24%) were the two main sources of revenue for state and local governments.

2013 Federal, State and Local Taxes Generated by the Printing Industry in Nebraska	
Type of Tax	Taxes Collected (\$ Millions)
Federal Taxes	
Individual income tax	\$19.93
Corporate income tax	\$5.10
Social security taxes	\$14.06
Excise taxes	\$1.29
Other taxes	\$2.17
Total Federal Taxes	\$42.56
Type of Tax	Taxes Collected (\$ Millions)
State Taxes and Local	
Individual income tax	\$4.13
Corporate income tax	\$0.62
Sales or Use Tax	\$2.94
Excise taxes	\$0.93
Property Taxes	\$7.32
Other taxes	\$0.81
License Taxes	\$0.81
Total State and Local Taxes	\$17.20
Total Fiscal Contribution	\$59.76

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

Over the next two years we will continue to track the inter-relationships between the printing industry and other industries within the state. As various industries continue to grow at above-average rates such as agriculture, forestry, fishing and hunting; transportation and warehousing; and finance and insurance, we will monitor how their indirect and induced relationships change with the printing industry. As various industries continue to decline in terms of output such as real estate and rental and leasing; health care and social assistance; arts, entertainment, and recreation; and accommodation and food services, we will monitor how their indirect and induced relationships change with the printing industry. Knowing the change in output and the relationship various industries have with our industry is helpful to Nebraska printers that currently service an industry that is either in growth or decline to better forecast demand. It also helps suppliers, association executives, policy makers, and other stakeholders better understand how changes in the printing industry will affect other industries.

North Dakota: Printing Industry Economic Contribution



In 2013 the printing industry directly contributed \$133.5 million in output, 735 jobs, and \$25.9 million in labor income to the North Dakota economy. After calculating backward-linked supply chain effects or indirect economic contributions and household spending generated by labor income or induced economic contributions, these values increased significantly. Total economic contributions to the North Dakota economy amounted to \$210.3 million in output, \$93.0 million in Value-Added (GDP), 1,206 jobs, and \$44.2 million in labor income.

Backward-linked supply chain effects or indirect contributions accounted for 19.6% or \$41.2 million of total economic contribution, 18.1% of employment contribution or 218 jobs, and 22.3% of labor income contribution or \$9.9 million. Household spending generated by labor income or induced economic contributions accounted for \$35.6 million or 16.9% of total economic contribution, 20.9% of employment contribution or 252 jobs, and 19.1% of labor income contributions or \$8.5 million.

Printing Industry Economic Contribution in North Dakota				
	Direct Contribution	Indirect Contribution	Induced Contribution	Total Economic Contribution
Output (\$1,000s)	\$133,512.5	\$41,242.0	\$35,594.4	\$210,348.9
Employment	735	218	252	1,206
Labor Income (\$1,000s)	\$25,904.5	\$9,851.5	\$8,463.0	\$44,219.0
Value Added or GDP (\$1,000s)	\$62,750.9	\$8,758.4	\$21,495.5	\$93,004.8

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

The printing industry in North Dakota generates \$93.0 million in Value-Added, or GDP, annually through its direct economic impact and indirect/induced effects or approximately 0.17% of the state's \$56.3 billion total economic output. Compared to the overall national figures, the North Dakota printing industry drives a smaller percent of GDP than other states. The national average is 0.49% of GDP.

The printing industry has a weaker relationship with other sectors of the economy in North Dakota compared to other states in the PIM region, leading to smaller multipliers. For every additional \$1 in output, the printing industry generates an additional \$0.58 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 \$0.31 in backward-linked industries and \$0.27 in additional household spending. In North Dakota, the backward-linked industries the printing industry has the strongest relationship with include wholesale trade; manufacturing; transportation and warehousing; professional, scientific, and technical services; 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; retail trade; finance and insurance; and manufacturing. See the chart on the following page for further detail on print's indirect and induced impact on each industry.

Indirect and Induced Output Effects by Industry from Printing Industry Production, NORTH DAKOTA, 2013

		<u>Indirect</u>		<u>Induced</u>		<u>Indirect + Induced</u>	
Rank	Industry	(\$1,000s)	% of Total	(\$1,000s)	% of Total	(\$1,000s)	% of Total
1	Wholesale trade	8,438.0	20.5%	2,323.1	6.5%	10,761.1	14.0%
2	Manufacturing	8,050.8	19.5%	2,630.2	7.4%	10,681.0	13.9%
3	Real estate and rental and leasing	1,829.1	4.4%	6,088.2	17.1%	7,917.3	10.3%
4	Finance and insurance	2,777.1	6.7%	3,698.3	10.4%	6,475.4	8.4%
5	Health care and social assistance	26.7	0.1%	6,048.1	17.0%	6,074.8	7.9%
6	Retail trade	467.3	1.1%	4,405.9	12.4%	4,873.2	6.3%
7	Transportation and warehousing	3,297.8	8.0%	827.8	2.3%	4,125.5	5.4%
8	Professional, scientific, and technical services	2,803.8	6.8%	667.6	1.9%	3,471.3	4.5%
9	Utilities	2,243.0	5.4%	1,161.6	3.3%	3,404.6	4.4%
10	Other services	1,081.5	2.6%	1,815.8	5.1%	2,897.2	3.8%
11	Information	1,628.9	3.9%	1,188.3	3.3%	2,817.1	3.7%
12	Administrative and waste management services	2,016.0	4.9%	440.6	1.2%	2,456.6	3.2%
13	Management of companies and enterprises	2,122.8	5.1%	186.9	0.5%	2,309.8	3.0%
14	Food services and drinking places	787.7	1.9%	1,375.2	3.9%	2,162.9	2.8%
15	Mining	1,174.9	2.8%	534.1	1.5%	1,709.0	2.2%
16	Construction	1,255.0	3.0%	293.7	0.8%	1,548.7	2.0%
17	Accommodation	614.2	1.5%	373.8	1.0%	988.0	1.3%
18	Agriculture, forestry, fishing, and hunting	400.5	1.0%	494.0	1.4%	894.5	1.2%
19	Educational services	80.1	0.2%	734.3	2.1%	814.4	1.1%
20	Arts, entertainment, and recreation	146.9	0.4%	333.8	0.9%	480.6	0.6%
Total		41,242.0	100.0%	35,621.1	100.0%	76,863.1	100.0%

Sources: BEA RIMS Multipliers, Census Bureau County Business Patterns, and PIA Print Market Atlas

Note: Total direct output contributions from printing industry production in North Dakota were \$133.5 million in 2013. Total Economic Contributions were \$210.35 million.

Every additional job in the North Dakota printing industry supports an additional 0.64 non-print jobs, inter-industry effects support 0.30 jobs and additional household spending 0.34 jobs. The printing industry has a strong inter-industry relationship with other manufactures—43.3% 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. For each job directly supported by the printing industry in North Dakota, the average labor income per job is \$35,244, and the indirect labor income per job is \$45,144.

Induced employment contributions are based on additional household spending cycling through the economy. The sectors of the North Dakota economy that are most affected by the induced employment contribution include health care and social assistance (22.1%); retail trade

(20.0%); and food services and drinking places (6.5%). Each job directly generated by the printing industry results in 0.34 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 average labor income for these jobs is \$33,530. See chart below for further detail on print's indirect and induced impact on each industry's employment.

Indirect and Induced Employment Effects by Industry from Printing Industry Production, NORTH DAKOTA, 2013

Rank	Industry	<u>Indirect</u>		<u>Induced</u>		<u>Indirect + Induced</u>	
		Jobs	% of Total	Jobs	% of Total	Jobs	% of Total
1	Manufacturing	94	43.3%	6	2.5%	101	21.4%
2	Health care and social assistance	0	0.1%	56	22.1%	56	11.9%
3	Retail trade	3	1.5%	50	20.0%	54	11.4%
4	Wholesale trade	22	10.3%	10	3.9%	32	6.9%
5	Food services and drinking places	8	3.7%	22	8.9%	31	6.5%
6	Other services	8	3.5%	20	8.0%	28	5.9%
7	Administrative and waste management services	19	8.9%	7	2.7%	26	5.6%
8	Finance and insurance	7	3.1%	15	6.0%	22	4.6%
9	Real estate and rental and leasing	3	1.4%	16	6.5%	20	4.2%
10	Professional, scientific, and technical services	13	5.9%	5	2.0%	18	3.8%
11	Transportation and warehousing	12	5.3%	5	1.9%	16	3.5%
12	Educational services	1	0.4%	14	5.5%	15	3.1%
13	Management of companies and enterprises	8	3.5%	1	0.5%	9	1.9%
14	Accommodation	4	1.8%	4	1.5%	8	1.6%
15	Construction	6	2.5%	2	0.8%	8	1.6%
16	Arts, entertainment, and recreation	2	0.7%	6	2.3%	7	1.5%
17	Information	3	1.4%	3	1.3%	6	1.3%
18	Utilities	2	1.1%	2	0.8%	4	0.9%
19	Mining	2	1.1%	2	0.7%	4	0.9%
20	Households	0	0.0%	3	1.4%	3	0.7%
21	Agriculture, forestry, fishing, and hunting	1	0.5%	2	0.9%	3	0.7%
Total		218	100.0%	252	100.0%	470	100.0%

Sources: BEA RIMS Multipliers, Census Bureau County Business Patterns, and PIA Print Market Atlas

Note: Total direct employment contributions from printing industry production in North Dakota were 735 jobs in 2013. Total Economic Employment Contributions were 1,206 jobs.

The North Dakota economy generated \$56.33 billion of Gross Domestic Product (GDP) in 2013 or approximately 0.32% of total U.S. output and 8.16% of PIM total output. Output increased by 13.8% in 2013 with two sectors driving almost 60% of the growth; agriculture and mining. The largest industries in terms of percent of GDP in the North Dakota are mining (15.0%); agriculture, forestry, fishing, and hunting (12.9%); real estate and rental and leasing (9.8%); wholesale trade (8.0%); and health care and social assistance (6.0%). We do not include government in the list above (9.6% 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 below, the industries that are driving the most growth in 2013 include mining (increased 31.2% adding 4.2% to total North Dakota output or 30.2% share of growth); agriculture, forestry, fishing, and hunting (increased 35.2% adding 3.8% to total output or 27.8% share of growth); and real estate and rental and leasing (increased 10.0% adding 1.0% to total output or 7.3% share of growth). See table below for the complete breakdown by industry.

Gross Domestic Product by Industry in North Dakota (millions of current dollars)							
Industry	GDP (millions of current dollars)		Percent Change 2012 to 2013	Share of Growth	Contribution to Change in Output	Percent Share of State Output	
	2012	2013				2012	2013
Mining	6,417	8,476	32.1%	30.2%	4.2%	13.0%	15.0%
Agriculture, forestry, fishing, and hunting	5,387	7,285	35.2%	27.8%	3.8%	10.9%	12.9%
Real estate and rental and leasing	5,019	5,519	10.0%	7.3%	1.0%	10.1%	9.8%
Wholesale trade	4,097	4,500	9.8%	5.9%	0.8%	8.3%	8.0%
Health care and social assistance	3,197	3,392	6.1%	2.9%	0.4%	6.5%	6.0%
Manufacturing	3,121	3,251	4.2%	1.9%	0.3%	6.3%	5.8%
Retail trade	2,745	2,958	7.8%	3.1%	0.4%	5.5%	5.3%
Construction	2,534	2,866	13.1%	4.9%	0.7%	5.1%	5.1%
Transportation and warehousing	2,640	2,849	7.9%	3.1%	0.4%	5.3%	5.1%
Finance and insurance	2,069	2,202	6.4%	2.0%	0.3%	4.2%	3.9%
Professional, scientific, and technical services	1,429	1,622	13.5%	2.8%	0.4%	2.9%	2.9%
Utilities	1,191	1,319	10.7%	1.9%	0.3%	2.4%	2.3%
Accommodation and food services	1,090	1,177	8.0%	1.3%	0.2%	2.2%	2.1%
Information	1,102	1,100	-0.2%	0.0%	0.0%	2.2%	2.0%
Other services, except government	800	847	5.9%	0.7%	0.1%	1.6%	1.5%
Administrative and waste management services	700	706	0.9%	0.1%	0.0%	1.4%	1.3%
Management of companies and enterprises	465	527	13.3%	0.9%	0.1%	0.9%	0.9%
Arts, entertainment, and recreation	149	163	9.4%	0.2%	0.0%	0.3%	0.3%
Educational services	129	137	6.2%	0.1%	0.0%	0.3%	0.2%
Government	5,228	5,432	3.9%	3.0%	0.4%	10.6%	9.6%
All industry total	49,509	56,328	13.8%	100.0%	13.8%	100.0%	100.0%

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, and Nebraska, but in North Dakota the largest industries are not as 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.

For example: mining accounts for 15.1% of total economic output in North Dakota or it is the largest industry. Only 2.2% of the printing industry's indirect and induced contributions to the regional economy are circulated through the mining industry. The second largest industry, agriculture, forestry, fishing, and hunting generates 13% of the state's output. Only 1.2% of the printing industry's indirect and induced contributions to the regional economy are circulated through the agricultural industry. Wholesale trade and manufacturing are the two most inter-related industries with the printing industry but are the fourth and sixth largest industries in North Dakota. See the chart below 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.

Top North Dakota Industries Compared to Industries' Indirect and Induced Relationship with the Printing Industry				
Overall Industry Rank in Terms of Output in ND	Industry	Percent of ND Regional GDP by Industry	Printing Industry Indirect and Induced Output % of Total	Industries Ranked by Percent of Indirect and Induced Output Generated Via Print Contributions
1	Mining	15.05%	2.2%	15
2	Agriculture, forestry, fishing, and hunting	12.93%	1.2%	17
3	Real estate and rental and leasing	9.80%	10.3%	3
4	Wholesale trade	7.99%	14.0%	1
5	Health care and social assistance	6.02%	7.9%	5
6	Manufacturing	5.77%	13.9%	2
7	Retail trade	5.25%	6.3%	6
8	Construction	5.09%	2.0%	16
9	Transportation and warehousing	5.06%	5.4%	7
10	Finance and insurance	3.91%	8.4%	4
11	Professional, scientific, and technical services	2.88%	4.5%	8
12	Utilities	2.34%	4.4%	9
13	Accommodation and food services	2.09%	4.1%	10
14	Information	1.95%	3.7%	12
15	Other services, except government	1.50%	3.8%	11
16	Administrative and waste management services	1.25%	3.2%	13
17	Management of companies and enterprises	0.94%	3.0%	14
18	Arts, entertainment, and recreation	0.29%	0.6%	19
19	Educational services	0.24%	1.1%	18

Federal, state, and local tax revenues generated by the North Dakota printing industry totaled \$15.39 million. The printing industry added \$62.75 million in direct value-added output to North Dakota's gross domestic product and 24.5% of this output was collected by the federal, state, and local governments in taxes. The main source of federal tax revenues was individual income taxes and social security taxes. North Dakota's printing industry revenues generated \$4.53 million in revenue for the state and local governments. Property taxes (34% of state and local collections) and general sales/use taxes (30%) were the two main sources of revenue for state and local governments.

2013 Federal, State and Local Taxes Generated by the Printing Industry in North Dakota	
Type of Tax	Taxes Collected (\$ Millions)
Federal Taxes	
Individual income tax	\$5.09
Corporate income tax	\$1.30
Social security taxes	\$3.59
Excise taxes	\$0.33
Other taxes	\$0.55
Total Federal Taxes	\$10.86
Type of Tax	Taxes Collected (\$ Millions)
State Taxes and Local	
Individual income tax	\$0.54
Corporate income tax	\$0.25
Sales or Use Tax	\$1.36
Excise taxes	\$0.52
Property Taxes	\$1.53
Other taxes	\$0.21
License Taxes	\$0.21
Total State and Local Taxes	\$4.53
Total Fiscal Contribution	\$15.39

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

Over the next two years we will continue to track the inter-relationships between the printing industry and other industries within the state. As various industries continue to grow at above-average rates such as agriculture, forestry, fishing, and hunting; mining; and professional, scientific, and technical services, we will monitor how their indirect and induced relationships change with the printing industry. As various industries continue to grow at below average rates or decline in terms of output such as information; administrative and waste management services; manufacturing; other services except government; and health care and social assistance, we will monitor how their indirect and induced relationships change with the printing industry. Knowing the change in output and the relationship various industries have with our industry is helpful to North Dakota printers that currently service an industry that is either in growth or decline to better forecast demand. It also helps suppliers, association executives, policy makers, and other stakeholders better understand how changes in the printing industry will affect other industries.

South Dakota: Printing Industry Economic Contribution



In 2013 the printing industry directly contributed \$246.2 million in output, 1,355 jobs, and \$53.7 million in labor income to the South Dakota economy. After calculating backward-linked supply chain effects or indirect economic contributions and household spending generated by labor income or induced economic contributions, these values increased significantly. Total economic contributions to the South Dakota economy amounted to \$382.1 million in output, \$168.0 million in Value-Added (GDP), 2,201 jobs, and \$85.2 million in labor income.

Backward-linked supply chain effects or indirect contributions accounted for 17.5% or \$67 million of total economic contribution, 17% of employment contribution or 374 jobs, and 18.3% of labor income contribution or \$15.6 million. Household spending generated by labor income or induced economic contributions accounted for \$69 million or 18% of total economic contribution, 21.4% of employment contribution or 471 jobs, and 18.7% of labor income contributions or \$41.7 million.

Printing Industry Economic Contribution in South Dakota				
	Direct Contribution	Indirect Contribution	Induced Contribution	Total Economic Contribution
Output (\$1,000s)	\$246,197.0	\$66,965.6	\$68,959.8	\$382,122.4
Employment	1,355	374	471	2,201
Labor Income (\$1,000s)	\$53,670.8	\$15,569.9	\$15,977.8	\$85,218.5
Value Added or GDP (\$1,000s)	\$115,712.6	\$10,537.2	\$41,705.8	\$167,955.6

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

The printing industry in South Dakota generates \$168 million in Value-Added, or GDP, annually through its direct economic impact and indirect/induced effects or approximately 0.36% of the state's \$46.7 billion total economic output. Compared to the overall national figures, the North Dakota printing industry drives a smaller percent of GDP than other states. The national average is 0.49% of GDP.

The printing industry has the weakest relationship with other sectors of the economy in South Dakota compared to other states in the PIM region, leading to smaller multipliers. 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 and rental and leasing; retail trade; finance and insurance; and manufacturing. See the chart on the following page for further detail on print's indirect and induced impact on each industry.

Indirect and Induced Output Effects by Industry from Printing Industry Production, SOUTH DAKOTA, 2013

Rank	Industry	Indirect		Induced		Indirect + Induced	
		(\$1,000s)	% of Total	(\$1,000s)	% of Total	(\$1,000s)	% of Total
1	Manufacturing	16,322.9	24.3%	4,530.0	6.6%	20,852.9	15.3%
2	Real estate and rental and leasing	2,363.5	3.5%	12,531.4	18.2%	14,894.9	11.0%
3	Finance and insurance	6,524.2	9.7%	7,878.3	11.4%	14,402.5	10.6%
4	Wholesale trade	10,857.3	16.2%	3,323.7	4.8%	14,180.9	10.4%
5	Health care and social assistance	49.2	0.1%	13,146.9	19.1%	13,196.2	9.7%
6	Retail trade	787.8	1.2%	8,789.2	12.8%	9,577.1	7.0%
7	Transportation and warehousing	5,908.7	8.8%	1,624.9	2.4%	7,533.6	5.5%
8	Information	2,683.5	4.0%	2,412.7	3.5%	5,096.3	3.7%
9	Professional, scientific, and technical services	3,791.4	5.7%	1,107.9	1.6%	4,899.3	3.6%
10	Administrative and waste management services	3,988.4	5.9%	763.2	1.1%	4,751.6	3.5%
11	Utilities	2,831.3	4.2%	1,797.2	2.6%	4,628.5	3.4%
12	Other services	1,600.3	2.4%	2,905.1	4.2%	4,505.4	3.3%
13	Management of companies and enterprises	3,914.5	5.8%	418.5	0.6%	4,333.1	3.2%
14	Food services and drinking places	1,403.3	2.1%	2,782.0	4.0%	4,185.3	3.1%
15	Accommodation	1,501.8	2.2%	1,083.3	1.6%	2,585.1	1.9%
16	Construction	1,846.5	2.8%	418.5	0.6%	2,265.0	1.7%
17	Agriculture, forestry, fishing, and hunting	295.4	0.4%	1,600.3	2.3%	1,895.7	1.4%
18	Educational services	98.5	0.1%	1,107.9	1.6%	1,206.4	0.9%
19	Arts, entertainment, and recreation	221.6	0.3%	664.7	1.0%	886.3	0.7%
20	Mining	49.2	0.1%	24.6	0.0%	73.9	0.1%
Total		67,039.5	100.0%	68,910.5	100.0%	135,950.0	100.0%

Sources: BEA RIMS Multipliers, Census Bureau County Business Patterns, and PIA Print Market Atlas

Note: Total direct output contributions from printing industry production in South Dakota were \$246.2 million in 2013. Total Economic Contributions were \$382.12 million.

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 manufactures—53.4% 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. For each job directly supported by the printing industry in South Dakota, the average labor income per job is \$39,600 and the indirect labor income per job is \$41,623.

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 (23.4%); retail trade (21.1%); and food services and drinking places (9.4%). 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 average labor income for these jobs is \$33,895. See chart below for further detail on print's indirect and induced impact on each industry's employment.

Indirect and Induced Employment Effects by Industry from Printing Industry Production, SOUTH DAKOTA, 2013

Rank	Industry	<u>Indirect</u>		<u>Induced</u>		<u>Indirect + Induced</u>	
		Jobs	% of Total	Jobs	% of Total	Jobs	% of Total
1	Manufacturing	200	53.4%	14	3.0%	214	25.3%
2	Health care and social assistance	0	0.1%	110	23.4%	110	13.1%
3	Retail trade	5	1.3%	99	21.1%	104	12.3%
4	Food services and drinking places	12	3.2%	44	9.4%	56	6.7%
5	Administrative and waste management services	33	9.0%	12	2.5%	45	5.3%
6	Finance and insurance	13	3.4%	31	6.5%	44	5.2%
7	Other services	10	2.6%	33	6.9%	43	5.0%
8	Wholesale trade	26	7.1%	15	3.2%	41	4.9%
9	Transportation and warehousing	20	5.2%	11	2.2%	30	3.6%
10	Real estate and rental and leasing	4	1.1%	24	5.1%	28	3.3%
11	Professional, scientific, and technical services	16	4.4%	9	1.9%	25	3.0%
12	Educational services	1	0.2%	20	4.2%	21	2.4%
13	Accommodation	8	2.2%	11	2.3%	19	2.2%
14	Information	5	1.4%	8	1.7%	13	1.5%
15	Construction	8	2.2%	3	0.7%	11	1.3%
16	Arts, entertainment, and recreation	1	0.4%	9	2.0%	11	1.3%
17	Management of companies and enterprises	8	2.1%	1	0.3%	9	1.1%
18	Households	0	0.0%	8	1.6%	8	0.9%
19	Agriculture, forestry, fishing, and hunting	1	0.2%	6	1.4%	7	0.8%
20	Utilities	3	0.7%	3	0.7%	6	0.7%
21	Mining	0	0.0%	0	0.0%	0	0.0%
Total		374	100.0%	471	100.0%	845	100.0%

Sources: BEA RIMS Multipliers, Census Bureau County Business Patterns, and PIA Print Market Atlas

Note: Total direct employment contributions from printing industry production in South Dakota were 1,355 jobs in 2013. Total Economic Employment Contributions were 2,201 jobs.

The South Dakota economy generated \$46.73 billion of Gross Domestic Product (GDP) in 2013 or approximately 0.27% of total U.S. output and 6.77% of PIM total output. Output increased by 6.8% in 2013 with agriculture, forestry, fishing, and hunting driving over 50% of the growth. The largest industries in terms of percent of GDP in the South Dakota economy are finance and insurance (15.5%); agriculture, forestry, fishing, and hunting (13.7%); manufacturing (9.1%); real estate and rental and leasing (9.0%); and health care and social assistance (8.3%). We do not include government in the list above (11.1% 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 on the following page, the industries that are driving the most growth in 2013 include agriculture, forestry, fishing, and hunting

(increased 33.8% adding 3.7% to total South Dakota output or 54.2% share of growth); finance and insurance (increased 6.8% adding 1.0% to total output or 15.4% share of growth); and health care and social assistance (increased 5.7% adding 0.5% to total output or 7.0% share of growth). See table below for the complete breakdown by industry.

Gross Domestic Product by Industry in South Dakota (millions of current dollars)							
Industry	GDP (millions of current dollars)		Percent Change 2012 to 2013	Share of Growth	Contribution to Change in Output	Percent Share of State Output	
	2012	2013				2012	2013
Finance and insurance	6,784	7,242	6.8%	15.4%	1.0%	15.5%	15.5%
Agriculture, forestry, fishing, and hunting	4,769	6,380	33.8%	54.2%	3.7%	10.9%	13.7%
Manufacturing	4,154	4,246	2.2%	3.1%	0.2%	9.5%	9.1%
Real estate and rental and leasing	4,030	4,198	4.2%	5.6%	0.4%	9.2%	9.0%
Health care and social assistance	3,670	3,878	5.7%	7.0%	0.5%	8.4%	8.3%
Retail trade	2,917	3,003	2.9%	2.9%	0.2%	6.7%	6.4%
Wholesale trade	2,731	2,892	5.9%	5.4%	0.4%	6.2%	6.2%
Construction	1,564	1,631	4.3%	2.3%	0.2%	3.6%	3.5%
Professional, scientific, and technical services	1,136	1,167	2.7%	1.0%	0.1%	2.6%	2.5%
Information	1,164	1,134	-2.6%	-1.0%	-0.1%	2.7%	2.4%
Accommodation and food services	1,094	1,133	3.6%	1.3%	0.1%	2.5%	2.4%
Transportation and warehousing	1,008	1,035	2.7%	0.9%	0.1%	2.3%	2.2%
Other services, except government	858	882	2.8%	0.8%	0.1%	2.0%	1.9%
Utilities	689	720	4.5%	1.0%	0.1%	1.6%	1.5%
Administrative and waste management services	675	658	-2.5%	-0.6%	0.0%	1.5%	1.4%
Management of companies and enterprises	509	532	4.5%	0.8%	0.1%	1.2%	1.1%
Educational services	282	290	2.8%	0.3%	0.0%	0.6%	0.6%
Arts, entertainment, and recreation	275	276	0.4%	0.0%	0.0%	0.6%	0.6%
Mining	263	229	-12.9%	-1.1%	-0.1%	0.6%	0.5%
Government	5,186	5,207	0.4%	0.7%	0.0%	11.9%	11.1%
All industry total	43,758	46,733	6.8%	100.0%	6.8%	100.0%	100.0%

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, and 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.

For example: finance and insurance accounts for 15.5% of total economic output in South Dakota or 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. The second largest industry, agriculture, forestry, fishing, and hunting generates 13.7% of the state’s output but only 1.4% of the printing industry’s indirect and induced contributions to the regional economy are circulated through the agricultural industry. This relationship between agriculture and print is consistent throughout the PIM region. Manufacturing and real estate and rental and leasing are the two most inter-related industries with the printing industry and are the third and fourth largest industries in South Dakota. See the chart below 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.

Top South Dakota Industries Compared to Industries' Indirect and Induced Relationship with the Printing Industry				
Overall Industry Rank in Terms of Output in SD	Industry	Percent of SD Regional GDP by Industry	Printing Industry Indirect and Induced Output % of Total	Industries Ranked by Percent of Indirect and Induced Output Generated Via Print Contributions
1	Finance and insurance	15.50%	10.6%	3
2	Agriculture, forestry, fishing, and hunting	13.65%	1.4%	16
3	Manufacturing	9.09%	15.3%	1
4	Real estate and rental and leasing	8.98%	11.0%	2
5	Health care and social assistance	8.30%	9.7%	5
6	Retail trade	6.43%	7.0%	6
7	Wholesale trade	6.19%	10.4%	4
8	Construction	3.49%	1.7%	15
9	Professional, scientific, and technical services	2.50%	3.6%	10
10	Information	2.43%	3.7%	9
11	Accommodation and food services	2.42%	5.0%	8
12	Transportation and warehousing	2.21%	5.5%	7
13	Other services, except government	1.89%	3.3%	13
14	Utilities	1.54%	3.4%	12
15	Administrative and waste management services	1.41%	3.5%	11
16	Management of companies and enterprises	1.14%	3.2%	14
17	Educational services	0.62%	0.9%	17
18	Arts, entertainment, and recreation	0.59%	0.7%	18
19	Mining	0.49%	0.1%	19

Federal, state, and local tax revenues generated by the South Dakota printing industry totaled \$26 million. The printing industry added \$115.7 million in direct value-added output to South Dakota's gross domestic product and 22.5% of this output was collected by the federal, state, and local governments in taxes. The main source of federal tax revenues was individual income taxes and social security taxes. South Dakota's printing industry revenues generated \$6 million in revenue for the state and local governments. Property taxes (49% of state and local collections) and general sales/use taxes (31%) were the two main sources of revenue for state and local governments. South Dakota levies no individual income or corporate income tax. It collects the lowest percent of total value added output in state and local taxes compared to the other PIM states at only 5.2%. The state also collects a lower general sales or use tax on consumers at only 4.0% but the average local sales tax is higher than average at 1.83% according to the Tax Foundation.

2013 Federal, State and Local Taxes Generated by the Printing Industry in South Dakota	
Type of Tax	Taxes Collected (\$ Millions)
Federal Taxes	
Individual income tax	\$9.38
Corporate income tax	\$2.40
Social security taxes	\$6.62
Excise taxes	\$0.61
Other taxes	\$1.02
Total Federal Taxes	\$20.03
Type of Tax	Taxes Collected (\$ Millions)
State Taxes and Local	
Individual income tax	\$0.00
Corporate income tax	\$0.00
Sales or Use Tax	\$1.87
Excise taxes	\$0.63
Property Taxes	\$2.93
Other taxes	\$0.38
License Taxes	\$0.38
Total State and Local Taxes	\$6.02
Total Fiscal Contribution	\$26.05

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

Over the next two years we will continue to track the inter-relationships between the printing industry and other industries within the state. As various industries continue to grow at above-average rates such as agriculture, forestry, fishing, and hunting; mining; and finance and insurance, we will monitor how their indirect and induced relationships change with the printing industry. As various industries continue to grow at below average rates or decline in terms of output such as mining; information; administrative services and waste management; arts entertainment and recreation; and manufacturing, we will monitor how their indirect and induced relationships change with the printing industry. Knowing the change in output and the relationship various industries have with our industry is helpful to South Dakota printers that currently service an industry that is either in growth or decline to better forecast demand. It also helps suppliers, association executives, policy makers, and other stakeholders better understand how changes in the printing industry will affect other industries.

Conclusions

The printing industry in the PIM region is a large and significantly interconnected industry especially in Iowa, Minnesota, and Nebraska. Each additional \$1 generated by the printing industry in the PIM region leads to an additional \$0.58 in inter-industry spending and \$0.49 in household spending. In another words, a dollar increase in print shipments leads to a \$1.07 increase in regional output.

The degree of interconnectedness is highest in Minnesota with every additional dollar of shipments generated by commercial printing leading to an additional \$1.27 spending in backward-linked industries and households. Similarly the employment effect is highest in Minnesota with each additional job resulting in 1.42 jobs supported by the spending of their labor income in backward-linked industries (indirect effect) and additional household spending of labor income earned (induced effect). South Dakota had the weakest output and employment multiplier in the PIM region or it had the lowest degree of interconnectedness.

Output and Employment Interconnectedness						
	<i>Each addition \$1 in Commercial Print Output Generates the Following Indirect and Induced Spending</i>			<i>Printing Industry Generates the Following Indirect and Induced Employment Due to Workers Spending Labor Income</i>		
	Indirect Spending	Induced Spending	Total Spending	Indirect Employment	Induced Employment	Total Employment
PIM Region	\$0.58	\$0.49	\$1.07	0.54	0.66	1.20
Iowa	\$0.40	\$0.33	\$0.73	0.38	0.41	0.78
Minnesota	\$0.69	\$0.58	\$1.27	0.63	0.80	1.42
Nebraska	\$0.34	\$0.30	\$0.64	0.36	0.40	0.76
North Dakota	\$0.31	\$0.27	\$0.58	0.30	0.34	0.64
South Dakota	\$0.27	\$0.28	\$0.55	0.28	0.35	0.62

The five states in the PIM region generate 4.0% of total U.S. economic output and 7.4% of total U.S. commercial print output. The region has a population of 11.95 million people or 3.9% of the total U.S. population and employees more than 7% of the U.S. printing industry. The top five industries in terms of the highest growth rates in 2013 are agriculture, forestry, fishing, and hunting (36.1%); mining (18.5%); management of companies and enterprises (8.7%);

construction (7.3%); and finance and insurance (5.5%). The five largest industries in the region are manufacturing (8.0% of output and 10.4% of employment); real estate and rental and leasing (11.2% of output and 2.4% of employment); finance and insurance (8.2% of output and 5.9% of employment); agriculture, forestry, fishing, and hunting (8.0% of output and 6.7% of employment); and health care and social assistance (7.6% of output and 15.0% of employment). We define the degree of interconnectedness as an increase in the output in one industry leading to a larger increase in output or employment in a different industry. The top five industries in the PIM region in terms of interconnectedness with print are; manufacturing, real estate and rental and leasing; finance and insurance; wholesale trade; and health care and social assistance.

On the following page is a figure with the ranks of each industry by total state output, current growth rate, and interconnectedness with the printing industry. Manufacturing is the most interconnected industry with print. As print shipments increase they add more in terms of output and employment to manufacturing than any other industry in the region. On the other end of the spectrum mining has the weakest relationship with print. Changes in print shipments and employment have little effect on mining.

PIM Regional Overview by Size of Industry, Current Growth Rate, and Interconnectedness with Print			
Industry	Regional Output Ranking	Current Growth Rate Ranking	Interconnectedness with Print Ranking
Manufacturing	1	15	1
Real estate and rental and leasing	2	8	2
Finance and insurance	3	5	3
Wholesale trade	6	6	4
Health care and social assistance	5	10	5
Professional, scientific, and technical services	8	12	6
Retail trade	7	13	7
Transportation and warehousing	10	11	8
Information	11	18	9
Management of companies and enterprises	12	3	10
Administrative and waste management services	14	16	11
Accommodation and food services	13	9	12
Utilities	16	7	13
Other services, except government	15	14	14
Agriculture, forestry, fishing, and hunting	4	1	15
Construction	9	4	16
Educational services	18	17	17
Arts, entertainment, and recreation	19	19	18
Mining	17	2	19

The PIM regional economy weathered the Great Recession better than the overall U.S. economy and has continued to recover at above average rates. The two sectors growing at the strongest rates include agriculture, forestry, fishing, and hunting (36%) and mining (18.5%). Both of these sectors are sensitive to changes in commodity prices, which can lead to large swings in output from year to year. They also have a very low degree of interconnectedness with the printing industry. The three largest industries in the PIM region, manufacturing (output increased 2.5%), real estate (output increased 4.6%), and finance (output increased 5.5%), account for 33% of output and 22% of the region’s economic growth in 2013. These three industries are also the most interconnected with the printing industry, or as print shipments and employment increase they add more to output in these three industries compared to others.

The Printing Industry not only contributes a significant amount of output, employment, and labor income to the PIM regional economy it also helps to fund state and local governments. Approximately 8% of the value direct value added output (\$233.4 million in tax revenue based on \$2.9 billion in output) generated by the PIM printing industry goes to fund state and local governments. Over 35% of this revenue for state and local governments is generated from property taxes. The \$82.6 million in property taxes includes estimated property taxes paid by individuals employed by the printing industry and taxes paid by print establishments. The second largest contributor to state and local coffers is individual income taxes paid by employees of the printing industry.

2013 Federal, State and Local Taxes Generated by the Printing Industry in the PIM Region	
Type of Tax	Taxes Collected (\$ Millions)
Federal Taxes	
Individual income tax	\$237.39
Corporate income tax	\$60.72
Social security taxes	\$167.50
Excise taxes	\$15.39
Other taxes	\$25.81
Total Federal Taxes	\$506.82
Type of Tax	Taxes Collected (\$ Millions)
State Taxes and Local	
Individual income tax	\$66.92
Corporate income tax	\$10.81
Sales or Use Tax	\$34.54
Excise taxes	\$23.55
Property Taxes	\$82.57
Other taxes	\$9.69
License Taxes	\$9.69
Total State and Local Taxes	\$233.36
Total Fiscal Contribution	\$740.18

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

Over the next two years Printing Industries of America's Center for Print Economics and Market Research will continue to update these figures for Printing Industry Midwest. As industries grow or decline we will see how that affects their interconnectedness with the printing industry and overall regional output and fiscal tax revenues.

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