CONEXUS INDIANA

BALL STATE UNIVERSITY
CENTER FOR BUSINESS AND ECONOMIC RESEARCH

Manufacturing and Labor Market Frictions

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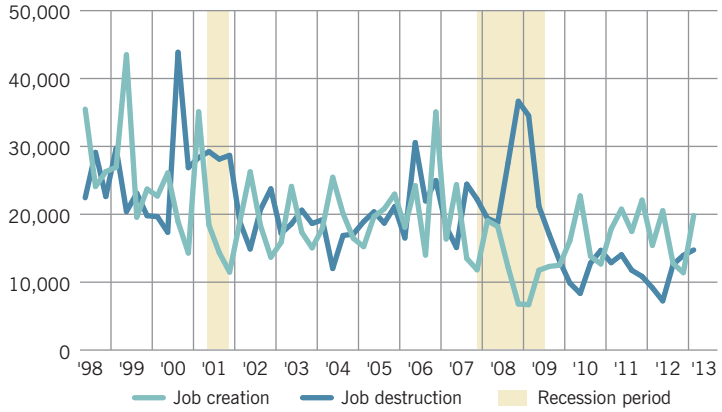
> "This policy brief describes some of the frictions in the current labor market and focuses on the growing impacts for manufacturing employment and wages in Indiana."

FIVE YEARS after the end of the Great Recession, significant labor market frictions plague many industries and regions. This policy brief describes some of the frictions in the current manufacturing labor market and focuses on the growing impacts for manufacturing employment and wages in Indiana. We begin with an examination of state manufacturing employment.

Quarterly changes to employment in manufacturing are accounted for by job creation and destruction among Indiana's manufacturing firms. As *Figure 1* illustrates, the period from 1998 through early 2013 (the most recently available data) experienced enormous quarterly variation in job creation and destruction. See *Figure 1*.

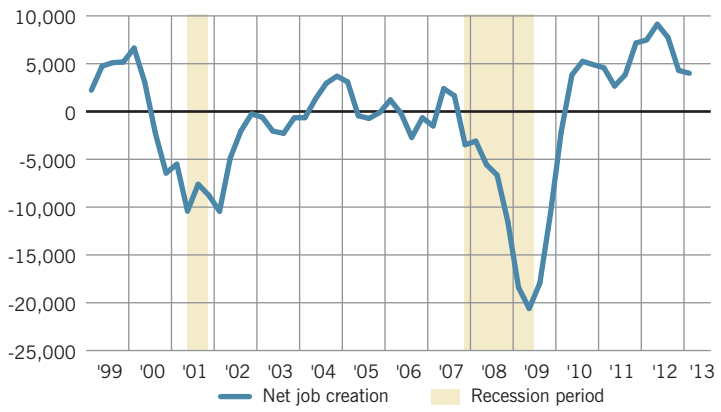
The net effect of this creation and destruction paints a clearer picture of the industry from 1999 through 2013. The quarterly net job creation still demonstrated some volatility, but when smoothed for a four-quarter moving average, a clear cycle of net job creation through the business cycle is evident. See *Figure 2*.

Figure 1. Manufacturing Job Creation and Destruction in Indiana, 1998-2013



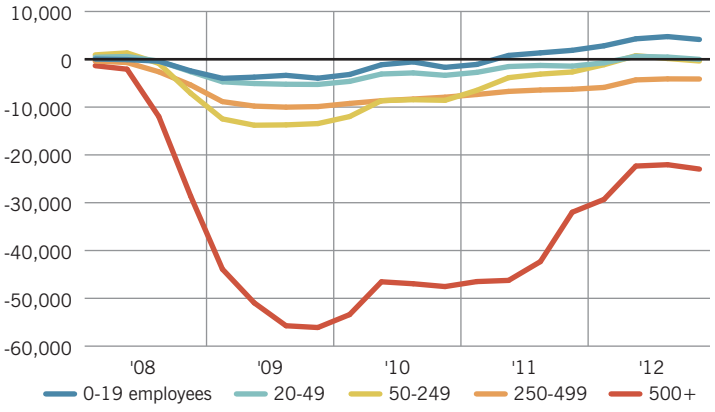
Source: Quarterly Workforce Indicators

Figure 2. Manufacturing Net Job Creation in Indiana, 1999-2013



Source: Quarterly Workforce Indicators

Figure 3. Cumulative Job Creation by Firm Size* in Indiana, 2008-2012



Source: Quarterly Workforce Indicators

* Firm size: Number of workers employed at the firm

Figure 4. Inflation-Adjusted Monthly Wages for Manufacturing Workers and New Hires in Indiana, 2001-2012

Source: Quarterly Workforce Indicators

The Great Recession, which formally lasted from December 2007 through June 2009, took an enormous toll on manufacturing employment, but the net effects were felt most heavily by larger firms in the state. Net job losses occurred primarily among larger firms, with the smallest firms adding net jobs by 2010. See *Figure 3*.

Viewed together, these results suggest that a manufacturing recovery is clearly in progress in Indiana, and that the rebound through 2013 and 2014 is likely to continue strongly across most manufacturing sectors in the state. However, it is not clear that labor market conditions have improved sufficiently to mitigate several worries for policymakers, businesses, and employees.

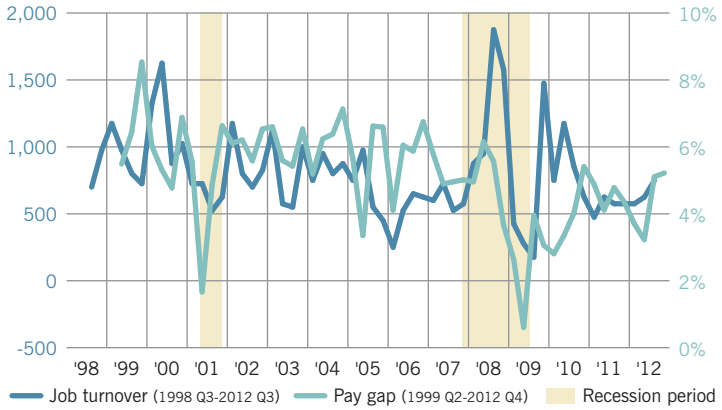
Real monthly wages for both existing employees and new hires have stabilized following the Great Recession, but the pay gap between these two groups closed significantly in the years immediately following the recession. This wage compression has eased slightly since 2010, but it points to a period when businesses may have found it difficult to find workers to fill vacancies openings in their plant. See *Figure 4*.

This wage compression is also affected by turnover. One method of assessing this is to evaluate the size of the pay gap between new and existing employees. Simply, tighter labor markets will lead to smaller gaps in pay between new and existing employees. *Figure 5* illustrates the pay gap between new and existing employees, plotted with the rate of job turnovers per quarter in Indiana's manufacturing firms.

These dynamics are more clearly visible in statistical analysis. *Figure 6* provides the impact to wage gap of a 1.0 percentage point increase in job turnover in Indiana.

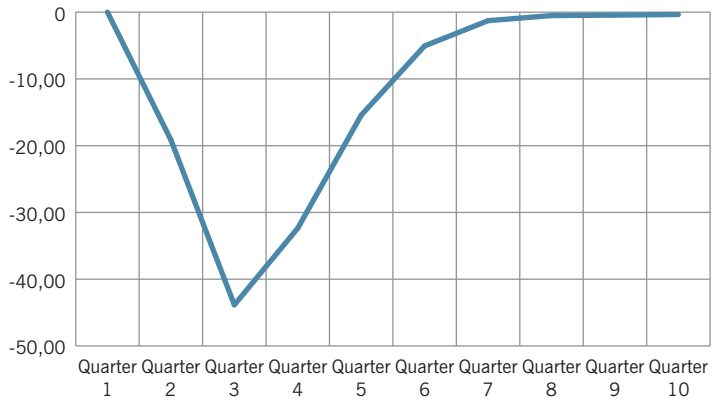
Accompanying these fluctuations in turnover and entry wages has been modest wage growth in the most recent data (through 2013). Of the 151 production and logistics occupations in Indiana, last year saw wage growth greater than inflation for only 65 occupations employing 28 percent of manufacturing and transportation workers. The mix of occupations with highest percentage wage growth is interesting because no clear trend appears. *Table 1* illustrates the top 25 occupations ranked by percentage wage growth.

Figure 5. Job Turnover and New/Existing Worker Pay Gap in Manufacturing Firms in Indiana, 1998-2012



Source: Quarterly Workforce Indicators

Figure 6. Response* of New Hire Pay Gap to a 1.0 Percent Increase in Job Turnover in Indiana



Source: Author calculations

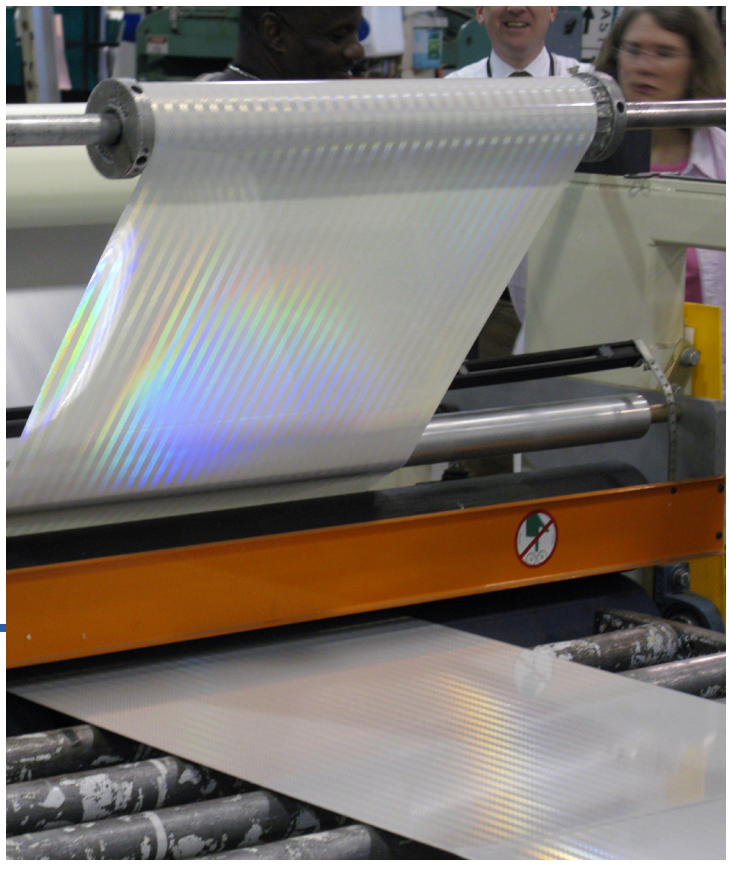
* This is the impulse response function from a two-lagged vector autoregression model of these variables, using a 1.0 unit (percent) shock to turnovers as the innovation to generate this quarterly non-accumulated response.

Table 1. Top 25 Manufacturing and Logistics Sectors in Indiana by Wage Growth

Occupation	2013 Total Employment	2013 Avg. Wages $	Employment Growth #	Employment Growth %	Wage Growth $	Wage Growth %
Layout workers, metal & plastic	140	23.68	-40	-22%	3.70	18.5%
Separating, filtering, clarifying, precipitating, & still machine setters, operators, & tenders	380	19.29	-140	-27%	2.52	15.0%
Food & tobacco roasting, baking, & drying machine operators & tenders	190	13.83	-240	-56%	1.67	13.7%
Railroad conductors & yardmasters	1,630	30.44	-260	-14%	3.41	12.6%
Gas compressor & gas pumping station operators	180	26.64	50	38%	2.84	11.9%
Locomotive engineers	1,430	31.88	140	11%	3.23	11.3%
Fiberglass laminators & fabricators	2,040	13.81	-30	-1%	1.38	11.1%
Forging machine setters, operators, & tenders, metal & plastic	1,280	18.54	90	8%	1.65	9.8%
Medical appliance technicians	190	15.97	50	36%	1.42	9.8%
Cleaning, washing, & metal pickling equipment operators & tenders	820	14.43	0	0%	1.15	8.7%
Aircraft structure, surfaces, rigging, & systems assemblers	n/a	24.20	n/a	n/a	1.86	8.3%
Production workers, all other	6,870	15.07	610	10%	1.14	8.2%
Molding, coremaking, & casting machine setters, operators, & tenders, metal & plastic	8,250	15.65	-10	0%	1.17	8.1%
Lathe & turning machine tool setters, operators, & tenders, metal & plastic	1,360	16.29	-80	-6%	1.19	7.9%
Print binding & finishing workers	1,820	14.50	50	3%	1.04	7.7%
Jewelers & precious stone & metal workers	410	22.08	30	8%	1.56	7.6%
Gas plant operators	280	32.53	120	75%	2.26	7.5%
Rail transportation workers, all other	80	23.58	-20	-20%	1.63	7.4%
Transportation attendants, except flight attendants	100	10.00	0	0%	0.69	7.4%
Meat, poultry, & fish cutters & trimmers	2,970	12.75	140	5%	0.85	7.1%
Paper goods machine setters, operators, & tenders	2,630	16.27	-40	-1%	1.05	6.9%
Textile knitting & weaving machine setters, operators, & tenders	80	14.18	-60	-43%	0.91	6.9%
Helpers – production workers	15,840	11.94	540	4%	0.76	6.8%
Woodworking machine setters, operators, & tenders, except sawing	3,900	13.57	90	2%	0.86	6.8%
Electrical & electronic equipment assemblers	6,140	12.83	780	15%	0.78	6.5%

Source: Quarterly Workforce Indicators

"Viewed together, these results suggest that a manufacturing recovery is clearly in progress, and that the rebound is likely to continue strongly across most manufacturing sectors in the state."



Long-Term Employment Conditions

Improvements in Indiana's educational attainment are slow but persistent. State population growth in 2014 reveals an optimistic change, but must be sustained in order to maintain an available workforce for manufacturing firms through the next decade. Even if employment growth slows, the most significant factor facing Indiana's manufacturing employers is the aging of the workforce. Since 1998, the share of manufacturing workers aged 55 to 64 has grown from 9.8 percent to 16.8 percent, which is a 71 percent increase in share in less than a generation's time. This rapid growth is due to the movement of the baby boom generation into near-retirement and retirement years.

Although this transition is occurring across the economy, it is larger and growing more rapidly in manufacturing. This phenomenon presents significant labor market frictions because it is likely that manufacturing firms face much higher search and training costs than the median firm in the state. See *Figure 7*.

Persistent growth in manufacturing turnover appears likely through the observable future. *Figure 8* illustrates the effect of a 1.0 percent growth in the share of 55-64 year old workers on manufacturing turnover. This effect implies that by 2024, employee turnover in manufacturing in Indiana could grow to one in four workers per year if current demographic conditions persist. This is a source of significant labor force friction in the state.

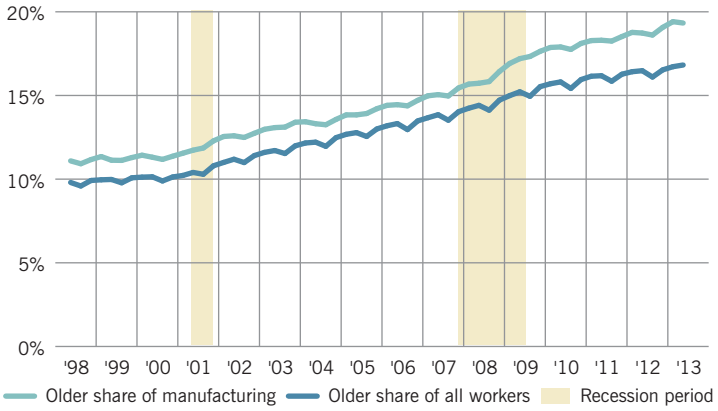
Summary

Summer 2014 marks the fifth year since the end of the Great Recession, and Indiana's growth in economic activity has been relatively robust. Much of this growth is attributable to manufacturing expansion; however, there is not a clear recovery in all places, and demand for workers has yet to solidly boost wages across manufacturing occupations. While job turnover has slowed to beneath the pre-recession levels, it has not led to a clear period of higher wages for 75 percent of manufacturing workers.

Anecdotally, firms find it difficult to match workers to jobs, but the aggregate data do not indicate this is a statewide problem. Rather, it is likely concentrated in a few disparate locations. Taken as a whole, labor markets are adjusted only slowly to the recovery.

The most significant challenge facing Indiana's manufacturing firms is the very high percentage of workers nearing retirement age (more than one in six workers over the next 10 years). This demographic shift will place significant burdens on the firms to locate and train workers to fill this potential employment gap in manufacturing.

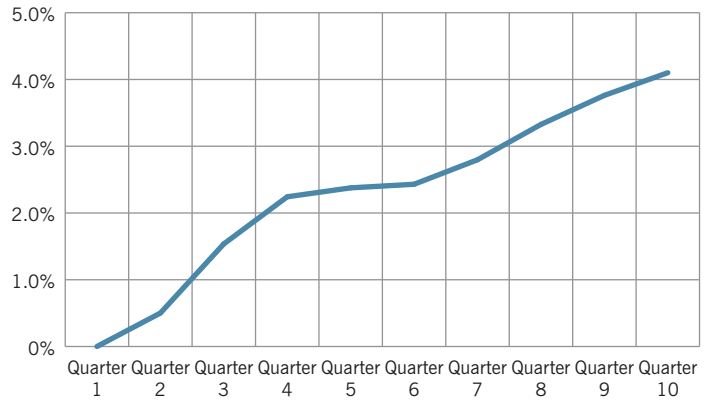
Figure 7. Older Workers* Share of Overall and Manufacturing Workforce in Indiana, 1998-2013



Source: Quarterly Workforce Indicators

* Older workers: Workers 55-64 years old

Figure 8. Response* of Manufacturing Job Turnover to a 1.0 Percent Increase in Older Workers** in Indiana



Source: Author calculations

* This is the impulse response function of a two-period vector autoregression of turnover and the share of older workers. The innovation is a 1.0 unit (percent) increase.

** Older workers: Workers 55-64 years old

About Conexus Indiana

Conexus Indiana is a private sector-led initiative focused on making Indiana a global manufacturing and logistics leader by strengthening the state's human capital and through building industry partnerships to capitalize on new opportunities and address key challenges.

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About Ball State CBER

The Center for Business and Economic Research (CBER) is an economic policy and forecasting research center at Ball State University. In addition to its analysis and data delivery offerings, CBER organizes the annual Indiana Economic Outlook and quarterly meetings of the Business Roundtable.

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