



THE IMPACT OF WEST CENTRAL INITIATIVE'S SUBSIDY OF EMPLOYEE TRAINING PROGRAMS IN WEST CENTRAL MINNESOTA

A follow-up to West Central Initiative's 2007 report, "Using labor turnover to measure the cost-effectiveness of labor training"

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Labor turnover is a hidden, but very real, cost of doing business. When an employee leaves a firm, particularly when the employee leaves voluntarily, that person's work has to be done by someone else. That could mean overtime costs to the firm until a new employee is hired and working up to speed. There are also direct costs of hiring someone new—the personnel department costs, advertising, interviewing, training, and the costs of an employment agency or a search firm. In west central Minnesota, West Central Initiative (WCI), a regional community foundation, has possibly discovered a new way to reduce these costs. Through their Workforce 2020 program they are providing funds to support skills training for employees in manufacturing firms. This study, like its predecessor in 2007, finds that firms that received training support have considerably lower turnover than firms that don't, even though the type of training differs and the economic climate examined is also quite different.

This report is divided into three sections. The first deals with the data used in this analysis and looks at the general condition of the manufacturing sector in west central Minnesota compared to the rest of Greater Minnesota. The second is analysis of the data, and the third presents conclusions. A discussion of the modifications to the data appears in Appendix I. Appendix II contains the same type of analysis done for the whole west central region, but only for manufacturing in Otter Tail County.

This study is a follow-up to West Central Initiative's report, "Using labor turnover to measure the cost-effectiveness of labor training," written in 2007. This report examines the same data from 2006 through the third quarter of 2011, the latest quarter available. This study looks at the relationship between employee training and turnover in the manufacturing sector in a very different environment than in the first study as the period under study included a major recession.

Manufacturing is a particularly important sector to follow since it has a large employment multiplier effect and therefore greater potential impact on a region than other sectors. Funds spent by manufacturing firms "induce" other employment in the region, particularly suppliers, transportation and business services. There is also more opportunity for wage increases in the manufacturing sector than in some other sectors of the economy, particularly if workers' skills increase. For these reasons, WCI has put a particularly strong emphasis on developing and improving the manufacturing workforce through its Workforce 2020 program. They see manufacturing as a driving force in keeping the region economically healthy. Investments in manufacturing are made through the WCI Workforce 2020 program, which is described on the WCI website as follows:

Workforce 2020 helps address problems created by a mismatch between the skills needed by the region's manufacturing and industrial businesses, and the skills readily available in the labor force or among current employees. The goal of the program is to assist workers in attaining skills that enable them to earn a living wage while strengthening the region's economy by addressing long-term shortages and gaps in the availability of skilled labor to meet the needs of employers. Workforce 2020 grants are not intended to supplant or support training and education services available through

local sources. The grants are specifically targeted to bring in nationally recognized experts to provide world-class training.¹

The data and a picture of the manufacturing sector in west central Minnesota

Data for this analysis was turnover data for manufacturing firms in the nine counties in WCI's service area. These data were obtained from the Minnesota Department of Employment and Economic Development (DEED). While the names of firms whose employees benefited from training grants from WCI were furnished to DEED, their names were excluded from the data set once DEED coded all the manufacturing firms in the west central region as either participants or non-participants. No firms were identified by name in the data once DEED coded it.

When reporting labor turnover, manufacturing firms report in one of two ways, by "Account" or by "Establishment." Account reporting firms report a single number for all their locations, and Establishment reporting firms report turnover for each location separately. In this report, as in the earlier report, Account reporting firms were excluded from the analysis, since the reported employment may also include employees in counties outside the WCI service area.²

The region WCI serves includes the nine counties the state has designated as the West central region, or Economic Development Region 4. These counties³ contain about 10 percent of the state's land area and about four percent of its population, indicating that the area is largely rural. The area lakes are a factor in the region in experiencing a significant increase in seasonal and retirement homes.

When looking at labor market statistics from 2006 through 2011 in the West central region, three facts stand out:

- Employment in the manufacturing sector is growing relative to manufacturing employment in the rest of Greater Minnesota⁴;
- Manufacturing unemployment is lower than in the rest of Greater Minnesota; and
- Average weekly wages for manufacturing employees are lower than in the rest of Greater Minnesota, but are growing faster.

Nationwide, manufacturing employment has been declining for a number of years, although it was relatively steady during the last five years in west central Minnesota, particularly when compared with employment manufacturing in the rest of Greater Minnesota.⁵

¹ www.wcif.org

² In one WCI county, an Account reporting firms reported employment equal to nearly half the county's population—enough employees to make it one of the state's 10 largest employers. It actually was a small facility that was part of a much larger firm with statewide facilities.

³ Becker, Clay, Douglas, Grant, Otter Tail, Pope, Stevens, Traverse, and Wilkin

⁴ In all comparisons in this report, Greater Minnesota means Minnesota excluding the seven Twin Cities Counties. Statistical results of the nine counties of the West central region are compared with results for the remaining 71 Greater Minnesota counties.

⁵ Comparing conditions, such as manufacturing employment, in West Central Minnesota with conditions statewide is an unfair comparison for two reasons. First, conditions in West Central Minnesota are included in

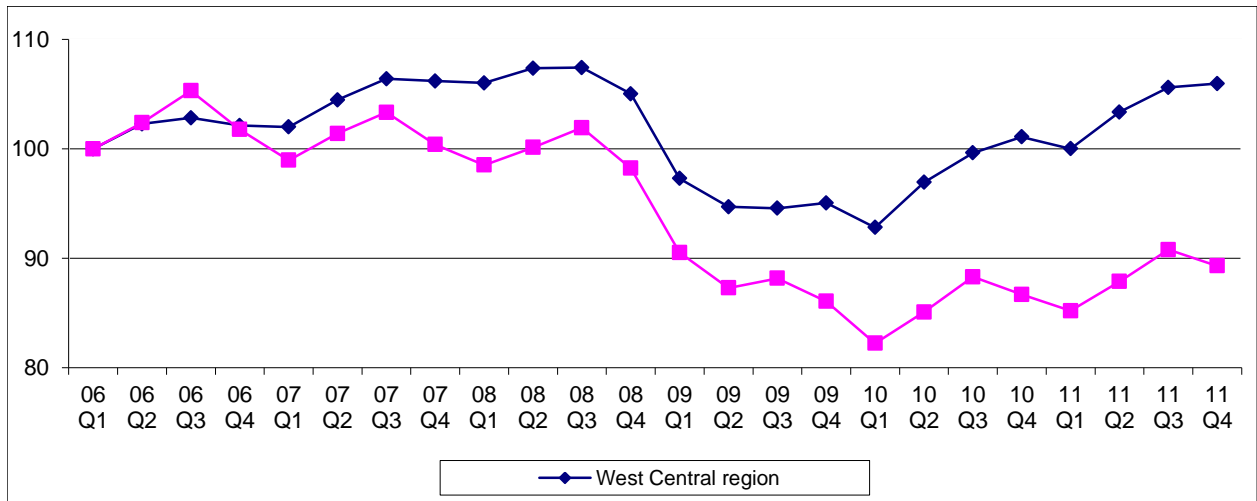
Table 1 shows the manufacturing labor force in both the west central region and the balance of Greater Minnesota. The two right-hand columns of this table contain an index of manufacturing employment using the first quarter of 2006 as its base. Using this comparison, manufacturing employment in the west central region grew by six percent by the fourth quarter of 2011, and it shrank 11 percent in the rest of Greater Minnesota. Manufacturing has the larger share of total employment in Greater Minnesota. Manufacturing employment fell in both areas during the “Great Recession” of 2008 and 2009, but the fall was greater in Greater Minnesota.

Table 1. Manufacturing employment as a percent of the labor force.

Year and Quarter	West Central Manufacturing Employment	Rest of Greater MN Manufacturing Employment	West Central Percent of Manufacturing Employment	Rest of Greater MN Percent of Manufacturing Employment	West Central Index	Rest of Greater MN Index
06 Q1	10,254	146,777	9.2%	13.1%	100.0	100.0
06 Q2	10,488	150,267	9.1%	13.1%	102.3	102.4
06 Q3	10,544	154,566	9.3%	13.5%	102.8	105.3
06 Q4	10,472	149,379	9.4%	13.2%	102.1	101.8
07 Q1	10,459	145,249	9.5%	13.0%	102.0	99.0
07 Q2	10,712	148,826	9.3%	12.9%	104.5	101.4
07 Q3	10,911	151,658	9.6%	13.3%	106.4	103.3
07 Q4	10,890	147,349	9.8%	13.1%	106.2	100.4
08 Q1	10,872	144,600	9.8%	12.9%	106.0	98.5
08 Q2	11,009	146,964	9.5%	12.7%	107.4	100.1
08 Q3	11,016	149,604	9.6%	13.0%	107.4	101.9
08 Q4	10,769	144,171	9.7%	12.9%	105.0	98.2
09 Q1	9,977	132,884	9.1%	12.0%	97.3	90.5
09 Q2	9,712	128,140	8.4%	11.3%	94.7	87.3
09 Q3	9,698	129,428	8.5%	11.6%	94.6	88.2
09 Q4	9,748	126,325	8.7%	11.4%	95.1	86.1
10 Q1	9,518	120,713	8.3%	10.7%	92.8	82.2
10 Q2	9,940	124,901	8.3%	10.8%	96.9	85.1
10 Q3	10,217	129,617	8.5%	11.2%	99.6	88.3
10 Q4	10,367	127,258	8.9%	11.2%	101.1	86.7
11 Q1	10,255	125,059	8.8%	11.0%	100.0	85.2
11 Q2	10,599	128,998	8.7%	11.1%	103.4	87.9
11 Q3	10,830	133,269	8.9%	11.4%	105.6	90.8
11 Q4	10,866	131,094	9.1%	11.4%	106.0	89.3

both parts of the comparison, and they should be included only once. Second, since the Twin Cities region includes at least half of Minnesota’s population and economic activity, it dominates all comparisons. In this study, comparisons look at the west central region compared to the rest of Greater Minnesota (Statewide values less those for the west central region and the Twin Cities).

Figure 1. Manufacturing employment index, West central region and the rest of Greater Minnesota



Source: MN DEED website and author's calculations

Although manufacturing was a smaller share of west central regional employment than it was in the rest of Greater Minnesota, the sector unemployment rate in west central Minnesota remained lower than in the rest of Greater Minnesota. The average weekly wage of the region's manufacturing employees was 36 percent higher at the end of 2011 than it was in the first quarter of 2006, versus a 19 percent increase in the weekly wage for the sector in the rest of Greater Minnesota. The unemployment rate for both areas is graphed in figure 2 and the average weekly wage in both areas is graphed in figure 3.

Despite the effects of the recession that officially occurred from the last quarter of 2007 through the second quarter of 2009, manufacturing employment in west central Minnesota held up well. Particularly telling is when the manufacturing unemployment rate in the west central region is compared to the manufacturing unemployment rate in the rest of Greater Minnesota. Manufacturing unemployment in the west central region was lower in all 24 quarters.

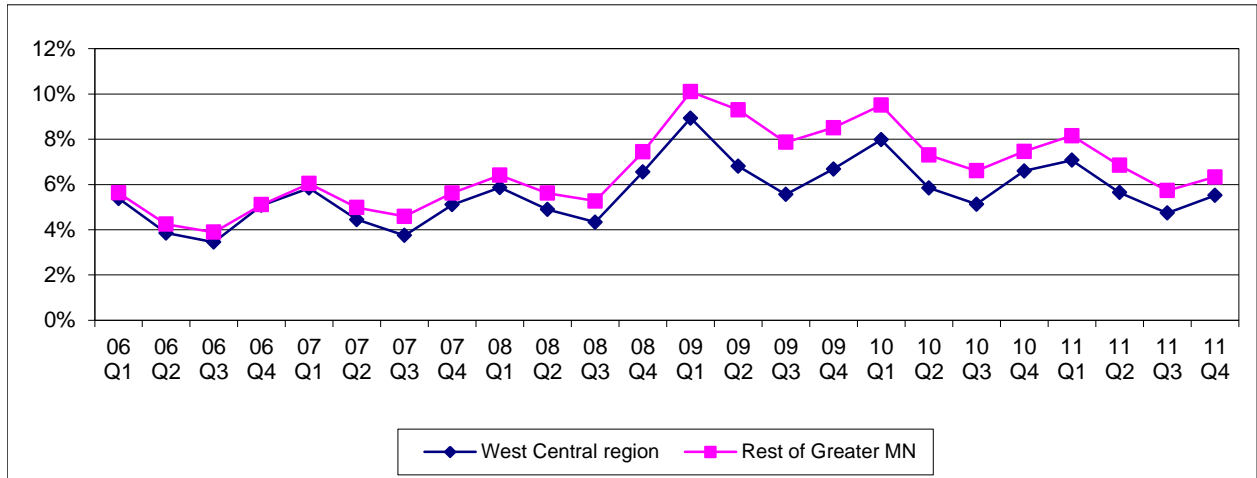
While manufacturing unemployment increased during the recession in throughout Greater Minnesota, the increase in unemployment was smaller in the west central region and, unlike the rest of Greater Minnesota, has now returned to its pre-recession level. The difference in average weekly wages between the two areas could be due to different mixes of manufacturing employees. If the rest of Greater Minnesota has a larger share of higher paid engineers in its workforce, it will have a higher average weekly wage. It is encouraging that the difference in average weekly wages is narrowing.

Table 2. Manufacturing unemployment rates and average manufacturing weekly wage.

Year and Quarter	Quarterly Mfg. unemployment		Average weekly mfg. wage	
	West Central Minnesota	Rest of Greater Minnesota	West Central Minnesota	Rest of Greater Minnesota
06 Q1	5.4%	5.6%	\$651	\$791
06 Q2	3.9%	4.2%	\$670	\$765
06 Q3	3.5%	3.9%	\$664	\$755
06 Q4	5.1%	5.1%	\$725	\$832
07 Q1	5.8%	6.0%	\$693	\$818
07 Q2	4.4%	5.0%	\$698	\$796
07 Q3	3.8%	4.6%	\$678	\$792
07 Q4	5.1%	5.6%	\$750	\$854
08 Q1	5.9%	6.4%	\$712	\$849
08 Q2	4.9%	5.6%	\$702	\$813
08 Q3	4.3%	5.3%	\$718	\$810
08 Q4	6.6%	7.4%	\$778	\$880
09 Q1	8.9%	10.1%	\$731	\$835
09 Q2	6.8%	9.3%	\$736	\$811
09 Q3	5.6%	7.9%	\$733	\$813
09 Q4	6.7%	8.5%	\$846	\$914
10 Q1	8.0%	9.5%	\$734	\$845
10 Q2	5.8%	7.3%	\$769	\$857
10 Q3	5.1%	6.6%	\$791	\$873
10 Q4	6.6%	7.5%	\$883	\$955
11 Q1	7.1%	8.2%	\$780	\$886
11 Q2	5.6%	6.8%	\$789	\$874
11 Q3	4.7%	5.7%	\$832	\$908
11 Q4	5.5%	6.3%	\$883	\$943

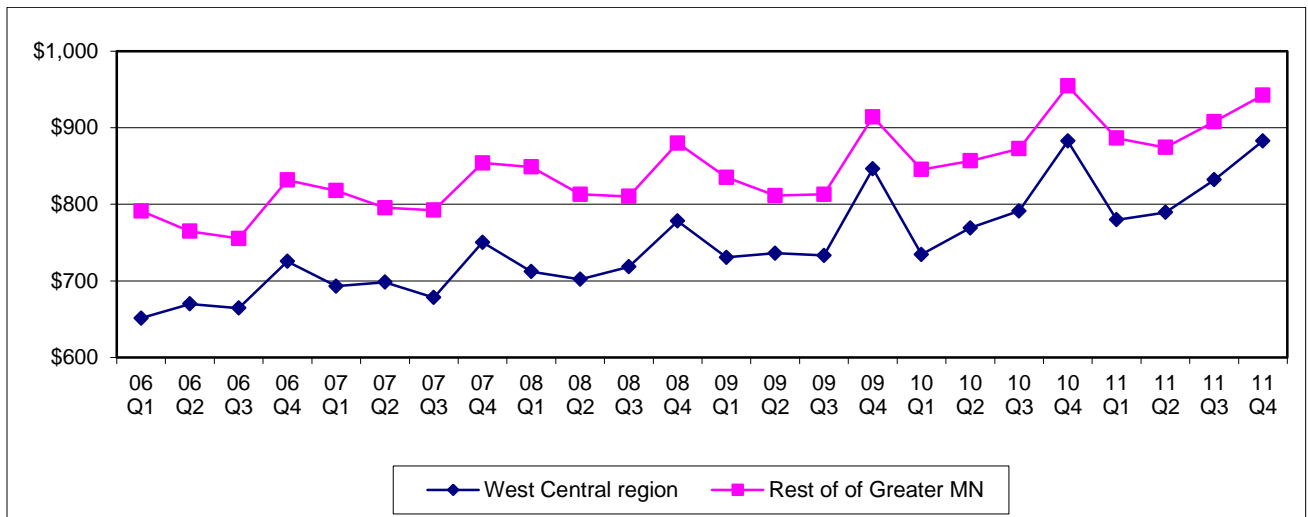
Source: MN DEED website and author's calculations

Figure 2. Quarterly unemployment rate in the west central region and the rest of Greater Minnesota.



Source: DEED website and author's calculations.

Figure 3. Average weekly wage for manufacturing employees in the west central region and the rest of Greater Minnesota.



Source: DEED website and author's calculations.

The current study

This study is a follow-up to a 2006 study—with a goal of finding a measurable impact for West Central Initiative’s grants for employee training programs in the manufacturing sector in its region. The focus of grants in the two periods differs. The earlier study showed that the average labor turnover rate in the firms doing the training was significantly lower than in the manufacturing firms not participating in the program—enough lower that the savings from reduced turnover more than covered the cost of training. In 17 of the 20 quarters examined, labor turnover in the firms providing the training was lower than in the firms not providing the training, and it was statistically significant in 15 of those quarters. The difference in turnover rates in the three quarters where the non-participating firms averaged lower turnover was statistically significant in only one quarter.

Since that time, West Central Initiative has continued to make grants for employee training in its region, but with two important differences.

- First, training was provided to fewer employees than in the earlier period.
- Second was different economic conditions. While the US economy suffered an economic downturn in 2002 and 2003, it was much milder than the downturn in 2008 and 2009.

Limitations of the data make it impossible to tell whether people leave their jobs voluntarily or involuntarily. It is, however, safe to say that during times characterized by labor scarcity, (e.g. “boom times”) voluntary labor turnover is greater than involuntary labor turnover. During economic downturns, the reverse is true. Even with the changed training and economic conditions, labor turnover was much lower among firms providing training through the Workforce 2020 program than among firms not providing training. Firms that provided training supported by WCI had lower labor turnover during the 2008-2009 recession in part because they held onto employees to protect their investment in training, and employees were reluctant to change jobs because they saw few opportunities elsewhere.

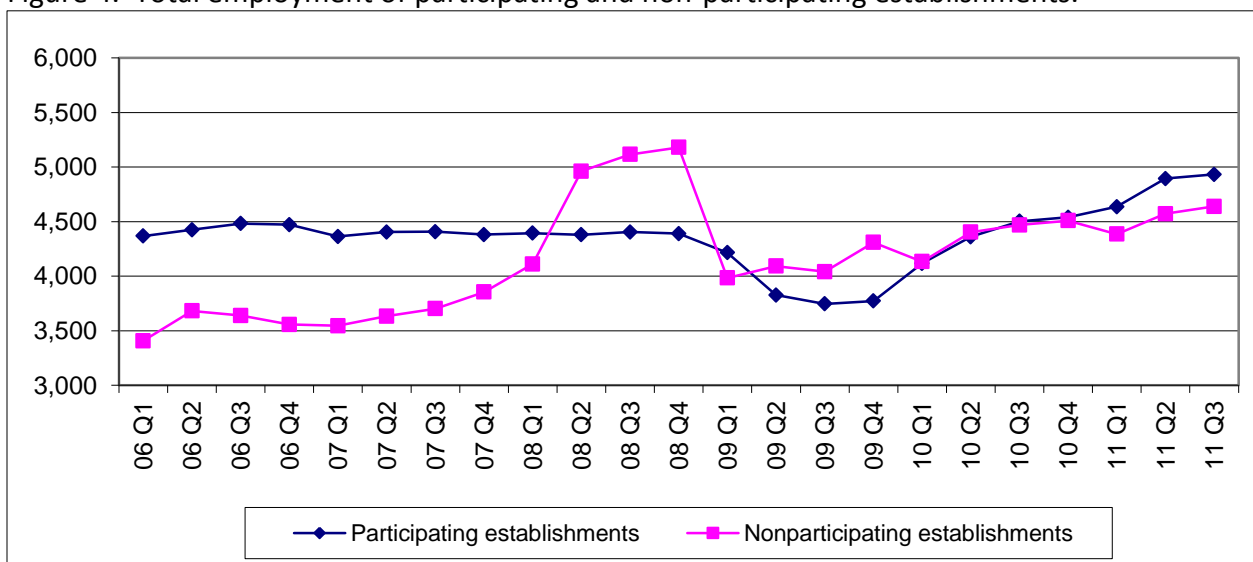
This study examines labor turnover during the 23 quarters from 2006 through the third quarter of 2011, the most recent quarter available. Turnover was lower in 22 of the 23 quarters examined and statistically significant in all 22 quarters. In the one quarter in which firms that were not accessing Workforce 2020 had lower turnover, the difference was significant. These results will be examined in detail below.

As in the earlier study, data on manufacturing labor turnover was obtained from the Minnesota Department of Employment and Development (DEED). While the DEED staff had access to the names of the firms conducting the training, the investigator performing this study was not given the names of firms participating in the training in a way that would connect them to the data.⁶

⁶ See Appendix 1 for an explanation of the way in which employers report their turnover information to DEED and how data were adjusted

Of the 221 west central Minnesota firms that report employment and turnover by Establishment, approximately 44 participated in the WCI Workforce 2020 program and 182 did not. (The number of firms changed slightly from quarter to quarter.) If a firm's employees benefited from a training grant at any time between 2006 and 2007 it was considered to be a participating firm. Total employment of each group was approximately equal. Non-participating firms averaged between 20 and 28 employees, and the participating firms averaged between 87 and 112 employees. Total employment was larger among the participating firms from 2006 through the first quarter of 2008, the first quarter of 2009, and from the first quarter of 2010 through the third quarter of 2011. The dramatic growth in employment among the non-participating firms was due to employment growth of one large employer.

Figure 4. Total employment of participating and non-participating establishments.



Source: MN DEED and author's calculations

One of the biggest differences in the two groups was the number of establishments with only one employee. There were 18 one-employee establishments among the non-participating and only one among the participating establishments. These one-person establishments were 10 percent of the non-participating and two percent of the participating establishments. These establishments represented a surprising variety of industries. These establishments may be one-person satellites of larger firms. It is possible that a number of the one-person establishments have been misclassified. That so few one-person establishments have participated in the training is not surprising. If these establishments are firms where the owner is its sole employee, any time spent in training may be viewed as time that is not spent in production, and with no staff to make up the lost working time, training could be seen as too costly.

Table 3. Types of west central manufacturing establishments with one employee

Leather hide tanning and finishing
Pottery, ceramics, and plumbing fixture manufacturing
Ready-mix concrete manufacturing
Other concrete product manufacturing
Saw blade and hand tool manufacturing
Chemical milling job shops
Farm machinery and equipment manufacturing
Pump and pumping equipment manufacturing
Other electronic component manufacturing
Bathroom vanities (except freestanding) stock or custom wood manufacturing
Bridges, custom made in dental laboratories
Sign manufacturing
Gasket, packing, and sealing device manufacturing

Data analysis

Employers nearly always want to have a well-trained workforce. More training means that the workforce is better prepared, more productive and less prone to accidents. At the same time, employers are sometimes wary of training employees, fearing that their employees will take their new skills and seek higher paying employment elsewhere. Labor theory tells us that more skills should lead to higher wages. A manufacturer raising wages to reward employees for higher productivity is not contributing to inflation.⁷

Since 1992, WCI has been supporting worker training in the west central region through the Workforce 2020 grant program. The specific training funded by Workforce 2020 adjusts according to what is both impactful and cutting edge. In the early years, the training supported by Workforce 2020 tended to focus on basic Lean concepts. While not considered cutting edge today, in the late 1990s and early 2000s Lean training was just emerging in the United States and was not readily available in west central Minnesota. Lean training empowers production employees to work more efficiently—faster and with fewer errors. Participating firms would train their entire workforce. In the earlier study, labor turnover rates were significantly lower in the firms doing the training.

Unfortunately, correlation—that people who work in firms that provide employee training are less likely to leave their job—is not the same as causation. We do not know why employee turnover is lower in firms that train their employees, and cannot find out without violating privacy of the firms and their employees. The employees may feel that they are getting some

⁷ This idea is best understood in terms of piece work. If an employee is paid, say, \$1 for each finished product she or he completes and completes 15 pieces an hour, that employee will be paid \$15 per hour. If through training the employee's productivity increases by 20 percent to 18 pieces an hour, that employee will earn \$18 per hour. Since paying employees on a piece-work basis is generally illegal, employers have to make guesses of employee productivity. Much of collective bargaining involves estimating employee productivity.

special attention that validates their sense of self worth, or the firms could be very nice places to work.

From 2006 through 2011, WCI made 265 grants to support employee training in 57 manufacturing firms⁸. In contrast to the earlier years, very few Workforce 2020 grants supported basic Lean training. True to the program's commitment to impactful, world-class training, grants during this period adjusted to support newly emerging products such as Toyota Problem Solving.

Between 2006 and 2011 uptake of Workforce 2020 waned and fewer employees actually received training, WCI wondered if the reduced turnover evidenced in the earlier study would prevail when fewer employees received training.

It did. Turnover was lower among employees of firms doing training in 22 of the 23 quarters examined and higher in only one quarter, a quarter when there was significant turnover that became a permanent drop in the labor force of one firm that had done some training. The difference in turnover rates in that quarter was statistically significant. In 19 of the 22 quarters where turnover in the firms doing training was lower than firms not doing training, the difference was statistically significant. These calculations were done using a test of difference between two proportions.

The hypothesis tested was that turnover among employees of non-participating firms was greater than among employees of participating firms. The test is to calculate a z-score using the following formula:

$$Z = \frac{p_1 - p_2}{\text{square root } ((p_1 * (1 - p_1)/n_1) + (p_2 * (1 - p_2)/n_2))}$$

where p_1 and p_2 are the turnover rates of employees in participating and non-participating firms, respectively and n_1 and n_2 are the number of employees in each group. To be statistically significant, the calculated statistic, or z-score, has to exceed 1.65. Statistically significant z-scores ranged from .3.17 to 10.21. Turnover rates by quarter and z scores are in table 4 and graphed in figure 5.

⁸ Some firms that provided training supported by WCI reported turnover as Account reporters. Their results were not included in this analysis

Table 4. Turnover rates of employees and z-score testing significance (must be higher than +1.65 or lower than -1.65 to be statistically significant).

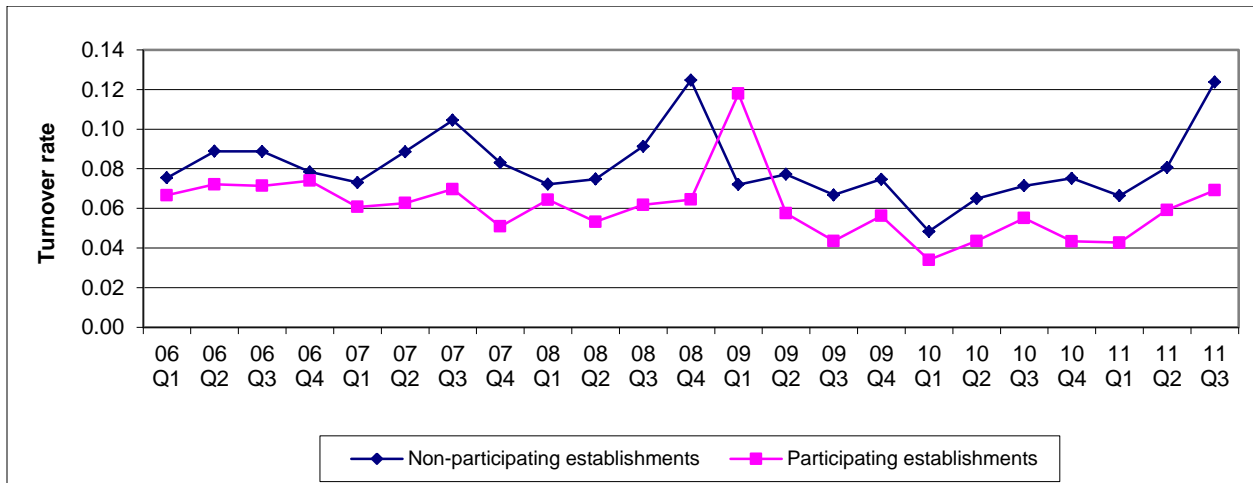
Year and quarter	Employee Turnover Participating Firms	Employee Turnover Non-participating Firms	z-score
06 Q1	0.08	0.07	1.49
06 Q2	0.09	0.07	2.75*
06 Q3	0.09	0.07	2.85*
06 Q4	0.08	0.07	0.74
07 Q1	0.07	0.06	2.17*
07 Q2	0.09	0.06	4.36*
07 Q3	0.10	0.07	5.51*
07 Q4	0.08	0.05	5.79*
08 Q1	0.07	0.06	1.43
08 Q2	0.07	0.05	4.28*
08 Q3	0.09	0.06	5.45*
08 Q4	0.12	0.06	10.21*
09 Q1	0.07	0.12	-7.12*
09 Q2	0.08	0.06	3.51*
09 Q3	0.07	0.04	4.53*
09 Q4	0.07	0.06	3.38*
10 Q1	0.05	0.03	3.29*
10 Q2	0.06	0.04	4.42*
10 Q3	0.07	0.06	3.17*
10 Q4	0.08	0.04	6.41*
11 Q1	0.07	0.04	4.94*
11 Q2	0.08	0.06	4.08*
11 Q3	0.12	0.07	9.05*

*Indicates statistically significant

Source: Minnesota DEED and author's calculations

Appendix II of this report contains the same calculations and figures for Otter Tail County, the only county in the data set where there were enough participating and non-participating firms to offer a meaningful comparison and to comply with DEED's confidentiality rules. The results for Otter Tail County are very similar to the results for the whole region.

Figure 5. Employee turnover rates, participating in training program and not participating in employee training program.



Conclusion

In this study, as in the previous study, employee training was associated with lower turnover. In the previous study, employee training was more general and involved more employees than in this study. This result is contrary to the popular supposition that employees who receive employer-paid training are more likely to seek (presumably higher paying) employment elsewhere. In west central Minnesota it appears that the employee training supported by Workforce 2020 is associated with lower turnover.

It is not clear, however, that employee training causes lower turnover. Correlation and causation are very different concepts. It is likely that with weekly wages in the manufacturing sector rising faster in the west central region than in the rest of Greater Minnesota, employers are raising their wages for employees whose productivity is increasing, encouraging them to stay with the company.

It is clear that turnover is lower among firms that have accessed training support through WCI's Workforce 2020 program. Turnover is costly. The cost of turnover includes the direct costs of hiring, the cost of paying existing employees to make up the output of employees who have left and are not yet replaced and new employees whose productivity is not up to standard during their training period, as well as the direct costs of hiring and training a new employee.

In the period under study, manufacturing unemployment increased during the 2008-2009 recession, but it did not increase as rapidly in west central Minnesota as it did in the rest of Greater Minnesota. There is anecdotal evidence that some employers made significant efforts to keep their labor force employed during the recession. It would make sense that employers who had made significant investments in their labor force would make these kinds of efforts.

Unfortunately, we do not know what, if any, employee training takes place in firms that do not participate in WCI's Workforce 2020 program.

Appendix I

Adjustments to the data

Adjustments to the data

Within the Establishment reporting firms, there were two data problems: irregular reporting and inconsistent reporting. Data were changed, with DEED's permission, to make them more consistent. Of the approximately 360 firms included in the database, nearly 70 had one or both problems in their data. Each problem will be considered separately.

Irregular reporting. Twenty-three quarters of data were examined. Reporting employee turnover to DEED is not mandatory. As a result, some firms reported data for several quarters and then skipped a quarter or two before reporting data again. Since manufacturing is generally a year-round process, the zero employment reported in these skipped quarters was replaced with the average of employment and turnover just before and just after the skipped quarter(s). If there were obvious seasonal patterns to employment and turnover, they were used in estimating the missing data.

Inconsistent reporting. Occasionally firms that were Establishment reporters would report as Account reporters for a quarter or two, and then return to Establishment reporting, or the other way around—most quarters reporting as Account reporters and then a quarter or two of Establishment reporting. Either way, the Establishment data appeared more erratic than unemployment data appeared to indicate. The inconsistent reporting data were changed so that they were consistent for the 23-quarter reporting period.

In a number of cases it was clear that an Establishment reporting firm was acquired by an Account reporting firm. The reported data would show 100 percent turnover in the acquired firm and a similar increase in employment in the acquiring firm. In these cases, the employment and turnover patterns of the Establishment reporting firm were continued for the remaining quarters, beginning with the quarter where 100 percent turnover was reported. No compensating adjustment was made to the Account reporting firm's data, since it was excluded from the analysis

Appendix II

Turnover tests for Otter Tail County

Otter Tail County is the second most populous county in west central Minnesota. According to the United States 2010 census, it contained 57,243 people, accounting for about 26 percent of the West Central population. The most populous county, Clay County had 59,644 residents and accounted for 27 percent of the region’s population.

In 2011, Otter Tail County had 3,639 people employed in manufacturing, 16.8 percent of county employment. The county accounts for about a third of manufacturing employment in the region, a share that has grown from 31 percent to 34 percent since 2006. Pope County has a slightly larger percent of its labor force employed in manufacturing, 17.1 percent, but its employed labor force is one-seventh the size of Otter Tail County’s and its population is only one-sixth the size. The highest average weekly wage for manufacturing employees was Clay County, which had the third lowest share of manufacturing employment. These statistics are in Table A2.1 below.

Table A2.1. Manufacturing employment statistics for west central Minnesota counties (average for 2011).

County	Population	Total Employment	Manufacturing Employment	Manufacturing Share of total Employment	Average Weekly wage for manufacturing employees
Becker	32,770	13,168	1,901	14.4%	\$780
Clay	59,644	17,622	824	4.7%	\$943
Douglas	36,240	17,159	2,761	16.1%	\$909
Grant	5,993	1,813	91	5.0%	\$484
Otter Tail	57,243	21,685	3,639	16.8%	\$738
Pope	10,896	3,691	633	17.1%	\$844
Stevens	9,749	4,984	742	14.9%	\$907
Traverse	3,530	1,091	30	2.7%	\$484
Wilkin	6,584	2,077	11	0.5%	\$441
Becker	32,770	13,168	1,901	14.4%	\$780

Otter Tail County includes 57 firms that reported by establishment. Of them, 12 received Workforce 2020 grants. The participating firms had a lower turnover rate in 18 of the 23 quarters examined and the difference was statistically significant in 11 quarters. In the third quarter of 2011, the last quarter examined, the participating establishments had 1,316 employees and the nonparticipating establishments had 1,790 employees. This data is shown in table A2.2 and graphed in figure A2.1.

Table A2.2. Turnover rates of employees and z-score testing significance (must be higher than +1.65 or lower than -1.65 to be statistically significant).

Year and quarter	Employee Turnover Participating Firms	Employee Turnover Non-participating Firms	z-score
06 Q1	0.06	0.09	2.78*
06 Q2	0.08	0.11	2.35*
06 Q3	0.09	0.11	1.88*
06 Q4	0.08	0.07	-1.11
07 Q1	0.08	0.06	-1.77*
07 Q2	0.07	0.09	2.45*
07 Q3	0.08	0.15	5.63*
07 Q4	0.05	0.08	2.92*
08 Q1	0.06	0.08	1.34
08 Q2	0.05	0.07	1.97*
08 Q3	0.07	0.14	5.81*
08 Q4	0.08	0.08	0.57
09 Q1	0.10	0.09	-0.59
09 Q2	0.06	0.08	2.48*
09 Q3	0.07	0.06	-0.78
09 Q4	0.05	0.06	0.65
10 Q1	0.04	0.04	0.48
10 Q2	0.04	0.06	2.03*
10 Q3	0.06	0.07	1.13
10 Q4	0.05	0.04	-0.41
11 Q1	0.05	0.06	1.12
11 Q2	0.07	0.07	0.11
11 Q3	0.07	0.09	2.35*

Source: MN DEED and author's calculations

Turnover among employees in participating firms exceed turnover in non-participating firms in five quarters, but the difference was not significant in any of those quarters. Turnover was lower among employees in participating firms in 18 quarters and the difference was statistically significant in 11 of those quarters.

Figure A2.1. Employee turnover rates, participating in training program and not participating in employee training program.

