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**ASSESSING THE ECONOMIC IMPACTS OF NEW
OR RECENTLY EXPANDED MANUFACTURING AND
EXPORTABLE SERVICE FIRMS IN NORTH DAKOTA**

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Abstract

This study examines the economic impacts that have resulted from new or recently expanded North Dakota firms in three sectors (agricultural processing, other manufacturing, and exportable services), addressing such dimensions as number of jobs created, compensation paid to employees, and the expenditures made to entities within the local area and elsewhere in the state. Information was obtained from a questionnaire completed by 42 new or recently expanded firms.

The responding firms had added an average of 29 jobs from 1990 to 1996. *General labor* was the job category accounting for the largest number of workers overall (52 percent), followed by *skilled labor* (16 percent) and *management* (12 percent). About 65 percent of the firms' new jobs have been filled with workers hired from the local area. The percentages of workers hired locally were highest in the *skilled labor*, *management*, and *clerical* job categories and lowest in the *machinist/welder*, *engineering*, and *sales* job categories. Average levels of compensation reported by the firms surveyed were similar to those reported by Job Service of North Dakota in a recent statewide study. The firms' annual expenditures within North Dakota averaged about \$47,000 per worker, of which about 91 percent represented payments to individuals and entities within the local region. Expenditures within North Dakota per worker ranged from \$40,391 for exportable services firms to \$52,034 for manufacturing firms (other than agricultural processing).

Key Words: economic development, economic impact, job creation, local hiring, expenditures

Highlights

Economic development has become a priority in North Dakota, and much of the state's development effort has been focused on agricultural processing, other manufacturing, and exportable services. This study examines the economic impacts that have resulted from new or recently expanded North Dakota firms in these three sectors, addressing such dimensions as number of jobs created, compensation paid to employees, and the expenditures made to entities within the local area and elsewhere in the state. Information was obtained via a questionnaire mailed to 124 new or recently expanded firms. The 42 completed surveys represented a response rate of 36 percent.

The responding firms had either begun their North Dakota operations in 1990 or thereafter (18 firms or 43 percent) or had expanded substantially since that time. These firms had added an average of 29 jobs from 1990 to 1996 (when the survey was conducted). Current employment for these firms averaged about 39 workers, ranging from 53 workers per firm for exportable services companies (e.g., telemarketing) to 27 for other manufacturing. *General labor* was the job category accounting for the largest number of workers overall (52 percent), followed by *skilled labor* (16 percent) and *management* (12 percent).

About 65 percent of the firms' new jobs have been filled with workers hired from the local area. The percentages of workers hired locally were highest in the *skilled labor*, *management*, and *clerical* job categories. On the other hand, the percentages of workers hired locally were relatively low in the following job categories: *machinist/welder* (27 percent), *engineering* (35 percent), and *sales* (43 percent).

Average levels of compensation reported by the firms surveyed were similar to those reported by Job Service of North Dakota in a recent statewide study.

The firms' annual expenditures within North Dakota averaged about \$47,000 per worker, of which about 91 percent represented payments to individuals and entities within the local region. Expenditures within North Dakota per worker ranged from \$40,391 for exportable services firms to \$52,034 for manufacturing firms (other than agricultural processing).

Assessing the Economic Impacts of New or Recently Expanded Manufacturing and Exportable Service Firms in North Dakota

Randal C. Coon and F. Larry Leistritz¹

Introduction

Economic development continues to be a key issue in North Dakota as the state tries to expand its economic base and provide opportunities for its residents (Leistritz 1995). Much of the state's recent success in economic development has occurred in the areas of agricultural processing, other manufacturing, and exportable services (Coon et al. 1995), and these sectors also have been emphasized as priority areas in the state's economic development program, **Growing North Dakota** (Leistritz 1995). Some of the new and expanding enterprises have located in North Dakota's larger population centers, but many have located in rural areas of the state. New enterprises choose a location for a variety of reasons, but availability of an adequate supply of labor possessing the proper skills or expertise is almost always a factor.

Exportable service firms, such as telemarketing and financial service centers, are labor intensive and must locate where adequate labor is available (Leistritz 1993). Agricultural processing firms tend to locate in an area strategic to the raw materials they need for their operation. Most of the new or recently expanded manufacturing firms in North Dakota are not large factories, but rather smaller production enterprises, often located in rural areas of the state. Many of these have been spawned by entrepreneurs with an idea and a desire to develop the business in their home area. Many of them start out on a small scale, so a large amount of labor may not be as critical a factor in their location as where the developer lives.

This study examines the economic impacts that have resulted from new or recently expanded firms in North Dakota, addressing such dimensions as number of jobs created, compensation paid to employees, and the expenditures made by the firms to entities within the local area and elsewhere within the state. New or expanding firms create new jobs which attract available labor that is either not employed or willing to change employment (e.g., for better wages or benefits). These firms also make expenditures into local economies for goods and services that are necessary to carry on their operations.

Evaluating the economic impacts of these new or recently expanded firms provides an indication of how important these economic development projects are to the locating areas. These projects tend to be highly coveted by rural communities, as evidenced by the competition among communities for the several recently initiated agricultural processing cooperatives (e.g., Dakota Growers Pasta, ProGold). However, when communities consider providing various forms of assistance or incentives to such enterprises, it is desirable for decision makers to have a clear understanding of the benefits and costs likely to be associated with the new facility. This

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report represents one step toward obtaining a clearer understanding of the local and statewide economic effects of new or expanding primary sector businesses.

Procedures

To determine the economic impacts that new or recently expanded manufacturing, exportable services, and agricultural processing firms will have in the local area and statewide, a survey instrument was developed (Appendix A). The questionnaire requested information about plant expansion, employment, and expenditures. A one-page (front and back) questionnaire was developed, with the hope that a short questionnaire would facilitate a high rate of response.

New or recently expanded firms were identified through a variety of sources. Local newspapers often had articles about new or expanding firms in their town or area. In addition to published information about new businesses, an economic development specialist from each of the eight regional council offices was contacted and asked for a list of businesses fitting our descriptions of new or recently expanded primary sector firms. Many individual cities or counties also have economic development specialists. These economic development workers were contacted and asked to provide a list of new or recently expanded firms in the areas of manufacturing, exportable services, and agricultural processing. Exportable services were defined to include telemarketing firms, reservations centers, financial service centers, data entry and processing firms, and similar enterprises that serve customers/markets outside the immediate area. Lists of businesses were compiled by state planning region and returned to key economic development personnel for review. The procedure resulted in a list of 124 new or recently expanded businesses for the survey. This list of businesses included 10 from the state's urban centers. These firms were included because they fit the profile of the firm types to be included in the study. Also, some business types were represented by a relatively small number of firms, so the inclusion of urban-based firms helped to provide a more adequate sample size. Some of the urban based firms may draw a substantial portion of their workforce from surrounding rural areas.

A first mailing was sent to each of the businesses in April, 1996. Following a telephone call to businesses not responding to the first mailing, a second mailing was distributed in May, 1996. A second-mailing telephone follow-up was also used to encourage response. Results of this effort produced 42 completed and useable questionnaires. Of the original 124 businesses in the survey pool, 3 were no longer in operation and 5 businesses had not yet started production operations at the time of the survey. Three completed questionnaires were received from urban-based businesses. Thus, the 42 completed surveys represented a response rate of 36 percent. Information obtained from the responding businesses provided valuable economic data about new enterprises.

Results

Firms responding to the survey included 12 agricultural processors, 21 that were engaged in other types of manufacturing, and 9 exportable service firms. Data from the survey were compiled for all firms, and in many of the tables, values are summarized for the three major firm types.

The study included both new and expanded firms in North Dakota; 18 of the 42 firms first began operations in 1990 or thereafter (Table 1). The remaining businesses had been established prior to 1990, but have expanded since that time. The firms were asked about their most recent expansion; 27 firms (64%) had expanded since 1990 (Table 2). More firms expanded in 1995 than in any other year, with 9 of the 42 firms (21%) adding to their plant capacity that year.

Table 1. First Year of Operation for Businesses Responding to Economic Development Survey, for New or Recently Expanded Manufacturing, Exportable Services, and Agricultural Processing Firms in North Dakota

Year	Number	Percent
Before 1970	9	21.4
1970-1979	6	14.3
1980-1989	9	21.4
1990	5	11.9
1991	2	4.8
1992	3	7.1
1993	1	2.4
1994	5	11.9
1995	<u>2</u>	<u>4.8</u>
Total	42	100.0

Expansion of plant facilities was reported by 24 of the 42 firms (57%) (Table 3). Of these businesses, 8 expanded their floor space by 51 to 100 percent, while 6 increased floor space by more than 100 percent. Only 3 of the responding firms increased their floor space by 25 percent or less, indicating that most expansion projects represented a substantial increase from the previous scale of operations. Of the firms adding floor space, 9 firms (37.5%) added 10,001 to 25,000 square feet, and 5 expanded by 25,001 to 60,000 square feet.

Table 2. Most Recent Year of Expansion or New Plant Opening, for Businesses Responding to Economic Development Survey, for New or Recently Expanded Manufacturing, Exportable Services, and Agricultural Processing Firms in North Dakota

Year	Number of Firms	Percent
Before 1990	2	4.8
1990	1	2.4
1991	2	4.8
1992	4	9.5
1993	4	9.5
1994	3	7.1
1995	9	21.4
1996	4	9.5
No Expansion	<u>13</u>	<u>31.0</u>
Total	42	100.0

Table 3. Floor Space Added by Recently Expanded Manufacturing, Exportable Services, and Agricultural Processing Firms in North Dakota, for Firms Responding to Economic Development Survey

Floor Space Expansion	Number of Firms	Percent
-----Percent Expansion-----		
Up to 25 percent	3	12.5
26 - 50 percent	7	29.2
51 - 100 percent	8	33.3
Greater than 100 percent	<u>6</u>	<u>25.0</u>
Total	24	100.0
-----Square Footage Expansion-----		
Up to 3,000 square feet	4	16.7
3,000 to 10,000 square feet	6	25.0
10,001 to 25,000 square feet	9	37.5
25,001 to 60,000 square feet	<u>5</u>	<u>20.8</u>
Total	24	100.0

Rather than expanding floor space, firms could increase production by expanding their hours of operation and adding additional shifts of workers. The advantage of shift expansion is that it allows the firm to increase production and creates additional jobs without costly building projects. Seven of the firms responding to the survey (17%) chose this type of expansion; six added permanent workers; and one firm added seasonal help (Table 4). The number of shift workers added ranged from 1 to 12, but the majority of firms (71.5%) added 4 to 6 workers. This indicates that most of the businesses adding shifts were rather small (i.e., adding a shift added six or fewer jobs).

Table 4. Worker Shifts and Number of Workers Added for New or Recently Expanded Manufacturing, Exportable Services, and Agricultural Processing Firms in North Dakota, for Firms Responding to Economic Development Survey

Type of Shifts	Number of Firms	Percent
-----Additional Shifts-----		
Permanent	6	14.3
Seasonal	1	2.4
None	<u>35</u>	<u>83.3</u>
Total	42	100.0
-----Additional Shift Workers-----		
Number of Workers	Number	Percent ^a
1	1	14.3
4	2	28.6
5	1	14.3
6	2	28.6
12	<u>1</u>	<u>14.3</u>
Total	7	100.0

^a May not sum to total due to rounding.

The number of jobs created by a new firm is one of the key indicators economic development specialists identify when considering its potential economic impact (Leistriz 1996). Employment is a concept which everyone can identify or relate to, so it has become a common denominator for assessing economic development projects. The number of these new or recently expanded firms hiring workers was 18 in 1990 and grew to 40 in 1996 (Table 5). During this period the total number of workers for the responding new or recently expanded firms grew from

482 to 1,661 employees. Growth in the number of employees was more rapid than the increase in the number of firms reporting hired help; the average number of employees per firm grew from 26.8 in 1990 to 41.5 in 1996. The increase in the average number of employees per firm reflects that larger firms have been locating in North Dakota over the past few years and that there have been recent expansions of existing businesses.

Table 5. Number of Firms Reporting Employees by Year and Total Employment for These Firms, for New or Recently Expanded Manufacturing, Exportable Services, and Agricultural Processing Firms in North Dakota, for Firms Responding to Economic Development Survey

Year	Firms Reporting Employees	Total Employees	Employees Per Firm
1990	18	482	26.8
1991	20	605	30.3
1992	22	706	32.1
1993	25	797	31.9
1994	32	1,261	39.4
1995	36	1,396	38.7
1996	40	1,661	41.5

Manufacturing firms added 318 jobs, exportable service companies increased their employment by 465, and 396 workers were added by the agricultural processing firms from 1990 to 1996 (Table 6). This gives a total of 1,179 new jobs for 40 responding firms. Among the manufacturing firms, 6 had added 5 or fewer jobs, while 3 had added 6 to 10 jobs, 8 added 11 to 25 jobs, and 3 added 26 or more jobs (Table 6). The percentage of firms adding 26 or more jobs was highest for the agricultural processors with 5 of 11 (45%) in this category, followed by the exportable service firms with 4 of 9 (44%). In general, new exportable service firms and agricultural processing plants have tended to be large enterprises with substantial numbers of new jobs.

Employment at the time of the survey was categorized for each of the three business types. Six of the 40 firms responding to the survey employed 76 or more workers in 1996, with exportable services firms leading the way with three in this category (Table 7). Only one agricultural processing firm had 10 or fewer employees; these businesses have generally been larger entities. Exportable services had an equal number of firms (3) with 10 or fewer jobs and 76 or more jobs. All three business types had a wide range of employment per firm, which indicates that new and expanded businesses include a wide range of sizes.

Table 6. Jobs Added Since 1990 and Distribution of New Jobs for New or Recently Expanded Manufacturing, Exportable Services, and Agricultural Processing Firms in North Dakota, for Firms Responding to Economic Development Survey

Employment	Business Type			Total ^a
	Manufacturing	Exportable Services	Agricultural Processing	
-----Employment-----				
1990 Employment	272	83	127	482
1996 Employment	590	548	523	1,661
1990-1996 Jobs Added	318	465	396	1,179
-----Number of Firms-----				
0-5 Jobs Added	6	3	3	12
6-10 Jobs Added	3	--	1	4
11-25 Jobs Added	8	2	2	12
26 or More Jobs Added	3	4	5	12

^aThis question was not completed on two returned survey instruments

Table 7. Total Employment at Time of Survey for New or Recently Expanded Manufacturing, Exportable Services, and Agricultural Processing Firms in North Dakota, for Firms Responding to Economic Development Survey

Total Employment	Business Type			Total ^a
	Manufacturing	Exportable Services	Agricultural Processing	
0-10	5	3	1	9
11-25	7	2	3	12
26-50	3	--	5	8
51-75	4	1	--	5
76 or More	1	3	2	6

^aThis question was not completed on two returned survey instruments

Employment was grouped into seven categories: managerial, clerical, engineering, sales, machinist/welders, skilled labor, and unskilled labor (Table 8). Firms employing up to 5 workers outnumbered those with 6 or more workers for all categories except skilled and unskilled labor. This indicates that these businesses needed more workers in the labor (skilled and general) categories than in the others. Most of the firms responding (69.4%) had 5 or fewer persons involved in management. Almost all were small enough so that they had 5 or fewer workers in engineering (97.5%) and sales (92.5%). Table 9 presents the total employment for each job category for each business type. The general labor category had the largest number of employees for manufacturing and agricultural processing firms, while exportable services used almost equal numbers of skilled and general labor workers. Agricultural processing had the highest percentage of management personnel (16.5%).

Table 8. Employment by Category and Percent of Total for Each Category for New or Recently Expanded Manufacturing, Exportable Services, and Agricultural Processing Firms in North Dakota, for Firms Responding to Economic Development Survey

Category	Firms Reporting Employment by Category			Percent of Employment by Category		
	Up to 5 Workers	6 or More Workers	Total	Up to 5 Workers	6 or More Workers	Total
Management	25	11	36	69.4	30.6	100.0
Clerical	33	4	37	89.2	10.8	100.0
Engineering	39	1	40	99.5	2.5	100.0
Sales	37	3	40	92.5	7.5	100.0
Machinist/Welder	37	4	41	90.2	9.8	100.0
Skilled Labor	5	6	11	45.5	54.5	100.0
General Labor	19	21	40	47.5	52.5	100.0

Table 9. Current Employment by Job Type for New or Recently Expanded Manufacturing, Exportable Services, and Agricultural Processing Firms in North Dakota, Based on Survey Results

Job Type	All Firms		Manufacturing		Exportable Services		Ag Processing	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Management	193	12.2	60	11.3	37	7.8	96	16.8
Clerical	107	6.8	41	7.7	33	7.0	33	5.8
Engineering	29	1.9	15	2.8	1	0.2	13	2.3
Sales	111	7.0	22	4.1	58	12.2	31	5.4
Machinist/Welder	66	4.2	66	12.4	0	--	0	--
Skilled Labor	245	15.5	32	6.0	180	37.9	33	5.8
General Labor	<u>826</u>	<u>52.4</u>	<u>296</u>	<u>55.7</u>	<u>166</u>	<u>34.9</u>	<u>364</u>	<u>63.9</u>
Total ^a	1,577	100.0	532	100.0	475	100.0	570	100.0

^a The current (1996) total employment by job category differs from the reported total in Table 6 because not all of the total employment was reported in the job categories question of the survey instrument.

Another topic of great interest to planners and decision makers is the percentage of the new jobs which are filled by persons from the local area. The desire to create job opportunities for area residents is one of the reasons frequently cited for supporting economic development initiatives. Also, if large numbers of workers come from outside the area (i.e., they immigrate to take jobs at the facility) nearby communities may be required to deal with the newcomers' needs for housing and community services. Table 10 shows the percentage of workers by category who were hired from within the local area. Workers in the management, clerical, skilled labor, and general labor categories were hired primarily from the local area, with all of these groups having at least 70 percent hired locally. On the other hand, the engineering, sales, and machinist/welder categories all had 42.5 percent or less hired locally. This provides an indication of the skill types that are not readily available in many areas across the state. Firms requiring substantial numbers of these job types may need to recruit many of their workers from outside the local area.

Table 10. Percent of Workers Hired From Local Area for New or Recently Expanded Manufacturing, Exportable Services, and Agricultural Processing Firms in North Dakota for Firms Responding to Economic Development Survey

Category	Workers	Workers Hired From Local Area	Percent of Workers From Local Area
Management	36	33	91.7
Clerical	37	32	86.5
Engineering	40	14	35.0
Sales	40	17	42.5
Machinist/Welder	41	11	26.8
Skilled Labor	50	50	100.0
General Labor	<u>40</u>	<u>28</u>	<u>70.0</u>
Total	284	185	65.1

Compensation for the various worker groups followed a pattern of monthly salaries for management, clerical, engineering and sales personnel while machinist/welders, skilled labor, and general labor were paid on an hourly basis (Table 11). All categories show a substantial range from the highest to lowest wage reported by the firms that responded to this question (Table 12). While wage ranges are wide, the relative levels of the various worker categories are consistent with expectations. For salaried workers, the low end wages were highest for management, followed by engineering, sales, and clerical. The situation was similar for those categories at the high end, although management was considerably above the other groups. Wage ranges for hourly workers were \$4.25 to \$9.00 for general labor, \$5.60 to \$12.00 for skilled labor, and \$7.00 to \$13.10 for the machinist/welders group. Relative levels of hourly wages paid are consistent with the skills required.

Table 11. Method of Determining Worker Pay for New or Recently Expanded Manufacturing, Exportable Services, and Agricultural Processing Firms in North Dakota, for Firms Responding to Economic Development Survey

Category	Hourly	Monthly	Commission	Total
	-----Percent-----			
Management	--	100.0	--	100.0
Clerical	--	100.0	--	100.0
Engineering	--	100.0	--	100.0
Sales	--	94.0	6.0	100.0
Machinist/Welder	90.9	9.1	--	100.0
Skilled Labor	100.0	--	--	100.0
General Labor	100.0	--	--	100.0

Table 12. Wage Range for Workers in New or Recently Expanded Manufacturing, Exportable Services, and Agricultural Processing Firms in North Dakota, for Firms Responding to Economic Development Survey

Category	Unit	Wage Range		
		Low	High	Median
		-----Dollars-----		
Management	Per Month	1,500.00	8,333.00	2,917.00
Clerical	Per Month	600.00	2,500.00	1,296.00
Engineering	Per Month	1,480.00	4,583.00	2,500.00
Sales	Per Month	1,280.00	3,750.00	2,150.00
Machinist/Welder	Per Hour	7.00	13.10	10.50
Skilled Labor	Per Hour	5.60	12.00	9.60
General Labor	Per Hour	4.25	9.00	7.20

A more meaningful measure of employee compensation is the average wage paid for each category for responding firms. Per month and per hour wages were converted to annual average compensation and are presented in Table 13. Management received the highest average annual compensation (\$36,891), followed by engineering (\$33,666), sales (\$26,059), machinist/welders (\$21,278), skilled labor (\$18,865), and clerical (\$16,576). The lowest paid group was the general labor category with annual wages of \$15,142. Average wages tend to be consistent with the job skills required, and the closeness of the compensation of the engineering category to that of management would indicate that high wages were used to attract engineers.

Average wages from the survey compared favorably with published average wages for North Dakota (Job Service of North Dakota 1997). Management salaries were nearly the same for survey respondents (\$3,074 per month) and state data (\$3,068) per month). Clerical monthly wages for the state were \$1,438, slightly higher than the survey response of \$1,318. Likewise, state averages for engineering and sales categories were higher than survey respondents, with \$2,929 to \$2,805 for engineering and \$2,444 to \$2,171 for sales. Machinists/Welders replying to the survey had an average wage of \$10.23 per hour, just higher than the state average of \$10.04. State average wage for skilled labor was \$9.94 compared to the survey's \$9.07; general labor for the state was also slightly higher than the survey date (\$7.46 compared to \$7.28). The closeness of the comparisons for all these categories suggest that wage rates for these new or expanding businesses are very competitive with state average wages.

Average annual income is applicable for full-time workers. Because of the nature of the work for the type of firms surveyed, substantial numbers of part-time or seasonal workers are employed by some firms. Incomes for these types of workers would most likely be substantially lower than for the full-time employees. Exportable service firms tend to use a lot of part-time workers, and agricultural processing firms often make use of seasonal employees. While the annual incomes were determined for full-time equivalents, worker annual incomes for part-time or seasonal employees would be less. Currently a worker profile study is being conducted as the second phase of this research project. Information from this study should provide more detailed data about part-time and seasonal workers.

Table 13. Average Monthly or Hourly Wage Rates and Corresponding Annual Average Income by Job Category, for Workers of Firms Responding to Economic Development Survey, and Published North Dakota Average Wages.

Category	Unit	Economic Development Survey		Job Service Survey	
		Average Wage	Average Annual Income ^a	Average Wage	Average Annual Income ^a
-----Dollars-----					
Management	Per Month	3,074.30	36,891.60	3,068.00	36,816.00
Clerical	Per Month	1,381.38	16,576.56	1,438.70	17,264.40
Engineering	Per Month	2,805.56	33,666.72	2,929.30	35,151.60
Sales	Per Month	2,171.60	26,059.20	2,444.00	29,328.00
Machinist/Welder	Per Hour	10.23	21,278.40	10.04	20,883.20
Skilled Labor	Per Hour	9.07	18,865.60	9.94	20,675.20
General Labor	Per Hour	7.28	15,142.40	7.46	15,516.80

^a Monthly wages were multiplied by 12 to get an annual average wage, and hourly wages were multiplied by 2080 to calculate annual average wage.

Worker compensation also is summarized by job category for each of the three business types (Table 14). Average annual earnings were highest for management in exportable service firms (more than \$41,000), followed by manufacturing firms' management personnel. Engineering and sales job categories also received higher than average earnings in all firm types. General labor was the group receiving the lowest relative wages for all business types.

The average compensation per worker was computed for each of the three firm types (Appendix Table 1). Exportable service firms had the highest average compensation (\$22,230), followed by manufacturing (\$20,777) and agricultural processing (\$19,732). The overall average annual employee compensation for these firms was \$19,846).

Table 14. Average Monthly or Hourly Wage Rates and Corresponding Average Annual Income by Job Category for Each Business Type, for New or Recently Expanded Manufacturing, Exportable Services, and Agricultural Processing Firms in North Dakota, for Firms Responding to Economic Development Survey

Category	Unit	Average Wage			Average Annual Income ^a		
		Mfg.	Exp. Serv.	Ag. Proc.	Mtg.	Exp. Serv.	Ag. Proc.
-----Dollars-----							
Management	Per Month	2,927.60	3,423.80	2,715.40	35,131.20	41,080.60	32,584.80
Clerical	Per Month	1,442.71	1,325.00	1,292.78	17,312.52	15,900.00	15,513.36
Engineering	Per Month	2,582.43	(d)	2,921.00	30,989.16	(d)	35,052.00
Sales	Per Month	2,634.80	2,958.50	2,779.83	31,617.60	35,502.20	33,357.96
Machinist/Welder	Per Hour	10.67	--	--	22,193.60	--	--
Skilled Labor	Per Hour	8.72	10.54	10.70	18,137.60	21,923.20	22,256.00
General Labor	Per Hour	8.17	7.17	7.11	16,993.60	14,913.60	14,788.80

(d) due to the small number of responses, this value was not reported to avoid disclosure problems.

^a Monthly wages were multiplied by 12 to get average annual wage, and hourly wages were multiplied by 2080 to calculate annual average wage.

The survey instrument also requested information on expenditure patterns of the businesses. Expenditures were requested by categories, including payroll, benefits, transportation, utilities, etc. A copy of the questionnaire, presented in Appendix A, shows the expenditure categories collected. The firms also were asked to estimate the percentage of expenditures in each category that were made in the local area, within the state, and outside North Dakota. This provides the basic data needed to estimate economic impacts using the North Dakota Input-Output Model.

Because the expenditures were collected for a sample of firms, and not for the entire population of new or recently expanded manufacturing, exportable service, and agricultural processing firms, it was desirable to express the results in a generalizable format. Expenditures per worker for each business type were selected as the presentation format, so economic impacts could be estimated for any type and size of new business. Expenditures for the survey categories were combined to correspond with the sectors of the input-output model used for this analysis. A summation of expenditures for all firms and each of the subdivisions yielded a distribution of total expenditures (Table 15). Manufacturing and exportable services firms had high percentages (45.7 and 55.7%, respectively) of their expenditures to the household sector (i.e., wages and salaries).

Table 15. Distribution by Economic Sector of a Dollar of Expenditures for New or Recently Expanded Manufacturing, Exportable Services, and Agricultural Processing Firms in North Dakota, Based on Survey Results

Sector	All Firms	Manufacturing	Exportable Services	Agricultural Processing
(4) Construction	.0318	.0556	.0016	.0281
(5) Transportation	.0450	.0156	.0143	.0876
(6) Comm. & Public Utilities	.0512	.0209	.0361	.0859
(7) Ag. Proc. & Misc. Mfg.	.2240	.1259	.0055	.4312
(8) Retail Trade	.1093	.1034	.1433	.0949
(9) FIRE	.1470	.2042	.2000	.0679
(10) Bus. & Personal Service	.0180	.0108	.0317	.0164
(11) Prof. & Soc. Service	.0078	.0068	.0101	.0074
(12) Households	<u>.3659</u>	<u>.4568</u>	<u>.5574</u>	<u>.1806</u>
Total	1.0000	1.0000	1.0000	1.0000

Expenditures per worker for each sector for all firms and each of the three firm types are presented in Table 16. Total expenditures per worker were \$58,413 for manufacturing firms, \$42,906 for exportable services, and \$83,957 for agricultural processing businesses. The larger amount for agricultural processing reflects the larger amounts spent for the raw products to be processed. All firms combined had total expenditures of \$60,979 per worker with households (wages and salaries) accounting for \$23,319 of that total.

Table 16. Expenditures per Worker by Economic Sector for New or Recently Expanded Manufacturing, Exportable Services, and Agricultural Processing Firms in North Dakota, Based on Survey Results

Sector	All Firms	Manufacturing	Exportable Services	Agricultural Processing
-----Dollars-----				
(4) Construction	1,936.92	3,247.87	67.93	2,356.92
(5) Transportation	2,745.43	911.60	613.20	7,356.63
(6) Comm. & Public Utilities	3,122.78	1,218.32	1,550.23	7,207.06
(7) Ag. Proc. & Misc. Mfg.	13,665.59	7,354.08	237.61	36,205.44
(8) Retail Trade	6,655.90	6,047.30	6,146.89	7,968.69
(9) FIRE	8,962.49	11,923.02	8,579.39	5,707.86
(10) Bus. & Personal Service	1,095.72	635.59	1,362.57	1,374.51
(11) Prof. & Soc. Service	475.15	394.68	433.70	620.40
(12) Households	<u>22,319.43</u>	<u>26,680.77</u>	<u>23,914.67</u>	<u>15,159.52</u>
Total	60,979.41	58,413.23	42,906.19	83,957.03

Information provided in Table 16 provides the first data set necessary to produce an economic impact estimate. Expenditure patterns within the local region, within North Dakota, and out of state provide the second. Expenditures made in the local area determine the local economic impact, even as in-state expenditures provide the basis for estimating statewide impacts. Out of state expenditures do not have an impact on the North Dakota economy. The percentages of expenditures for each economic sector remaining in the region (i.e., paid to entities located in the region) and in North Dakota are presented in Table 17. (Appendix Table 2 contains a detailed expenditure distribution for each business type for the expenditures categories used on the survey instrument. These categories were combined to match the input-output model sectors presented in Table 17.) Applying these expenditure distributions to the outlays per worker (Table 16) yields expenditures per worker for each sector in the local area and in North Dakota (Table 18). Values were calculated for all firm types — manufacturing, exportable services, and agricultural processing. These numbers represent averages for the firms responding to the survey.

To use this table, the type of firm and number of employees must be known. Multiplying the number of workers by the expenditures per worker for the appropriate business type gives the total local and state impact expenditures. These values could then be used by the North Dakota Input-Output Model to estimate the secondary and total economic impacts of the new firm. For a detailed discussion of the input-output model, see Coon et al. (1989) and Coon et al. (1993). A complete discussion of the model will not be presented here, but briefly, the model will estimate impacts in terms of increased business activity, retail trade, personal income, tax collections, and secondary employment.

Conclusions

A survey of new or recently expanded manufacturing, exportable services, and agricultural processing firms in North Dakota was undertaken to gather key economic information. Data obtained from this study can be helpful when evaluating economic development projects in terms of employment created, job types, wages, and economic impact, both statewide and for the region where the enterprise is located.

Many of the firms responding to this survey were from rural areas of North Dakota. Some were small enterprises, just getting started, whereas others were rather large, fully operational businesses. These companies **are** economic development in North Dakota -- they are providing new jobs and spending additional money in the local economy. The characteristics of these firms provide an indication of how they benefit the state. Jobs range from the management level to general labor employees. Most of the workers are being hired locally, although a lower percentage of engineering, sales, and machinist/welders come from the local area. This is probably due to the lack of available workers with these skills in all rural areas of the state. It is unlikely that surplus machinists/welders can be found anywhere in the state.

Table 17. Allocation of Expenditures by Economic Sector to the Local Region, Within North Dakota, and Outside North Dakota for New or Recently Expanded Manufacturing, Exportable Services, and Agricultural Processing Firms in North Dakota, Based on Survey Results

Sector	All Firms			Manufacturing Firms			Exportable Service Firms			Agricultural Processing Firms		
	Local Reg.	N. Dakota	Other States	Local Reg.	N. Dakota	Other States	Local Reg.	N. Dakota	Other States	Local Reg.	N. Dakota	Other States
(4) Construction	74.0	80.0	20.0	100.0	100.0	0.0	10.0	100.0	0.0	56.7	66.7	33.3
(5) Transportation	48.0	59.4	40.6	50.4	63.7	36.3	60.0	73.0	27.0	37.0	44.3	55.7
(6) Comm. & Public Utilities	75.6	84.0	16.0	81.4	90.9	9.1	82.1	86.3	13.7	59.7	75.0	25.0
(7) Ag. Proc. & Misc. Mfg.	30.2	43.5	56.5	25.0	50.8	49.2	38.3	56.7	43.3	9.5	22.5	77.5
(8) Retail Trade	53.5	70.1	29.9	62.0	74.5	25.5	64.4	83.9	16.1	38.2	55.7	44.3
(9) FIRE	85.5	90.5	9.5	90.1	97.1	2.9	89.6	90.9	9.1	78.3	83.1	16.9
(10) Bus. & Personal Service	57.7	74.0	26.0	49.0	70.0	30.0	70.0	90.0	10.0	56.7	66.7	33.3
(11) Prof. & Soc. Service	54.6	60.4	39.6	72.9	72.9	27.1	55.6	70.6	29.4	32.5	37.5	62.5
(12) Households	95.8	95.8	4.2	99.5	99.5	0.5	93.8	100.0	0.0	87.3	87.3	12.7

-----Percent-----

Table 18. Expenditures per Worker in Locating Region and in North Dakota by New or Recently Expanded Manufacturing, Exportable Services, and Agricultural Processing Firms in North Dakota, for Firms Responding to Economic Development Survey

Sector	All Firms		Manufacturing Firms		Exportable Service Firms		Agricultural Processing Firms	
	Local Region	North Dakota	Local Region	North Dakota	Local Region	North Dakota	Local Region	North Dakota
(4) Construction	1,433.32	1,549.54	3,247.87	3,247.87	67.93	67.93	1,336.37	1,572.07
(5) Transportation	1,317.81	1,630.79	459.45	580.69	367.92	447.64	2,721.95	3,258.99
(6) Comm. & Public Utilities	2,360.82	2,623.14	991.71	1,107.45	1,272.74	1,337.85	4,302.61	5,405.30
(7) Ag. Proc. & Misc. Mfg.	4,127.01	5,944.53	1,838.52	3,735.87	91.00	134.72	3,439.52	8,146.22
(8) Retail Trade	3,560.91	4,665.79	4,051.69	4,5015.24	3,958.60	5,157.24	3,044.04	4,438.56
(9) FIRE	7,662.93	8,111.05	10,742.64	11,577.25	7,687.13	7,798.67	4,469.25	4,743.23
(10) Bus. & Personal Service	632.23	810.83	311.44	444.91	953.80	1,226.31	779.35	916.80
(11) Prof. & Soc. Service	259.43	286.99	287.72	287.72	241.14	306.19	201.63	232.65
(12) Households	<u>21,382.01</u>	<u>21,382.01</u>	<u>26,547.37</u>	<u>26,547.37</u>	<u>22,431.96</u>	<u>23,914.67</u>	<u>13,234.26</u>	<u>13,234.26</u>
Total	42,736.47	47,004.67	48,478.41	52,034.37	37,072.22	40,391.22	33,528.98	41,948.08

-----Dollars-----

Wages for each job category reported in this study have a wide range, which is understandable when considering the variety of products and services involved and the different locations of new or recently expanded firms. Average wage for each job classification is probably a more meaningful measure of worker compensation for these firms. When converted to an annual average wage basis, these wage/salary levels compare favorably with those for similar job descriptions across the state.

Information obtained from the survey can be used to estimate the overall economic impact for a new firm locating in North Dakota. Expenditure amounts and patterns were used to derive expenditures that each business type would make in each economic sector per worker employed. These values were calculated for the locating region and the state. This provides those concerned with economic development a measure of the local and statewide impacts from a new development project. If a proposed facility can estimate its employment, input-output analysis can be used to quantify the impacts resulting from operations of the facility.

This study provides researchers and economic development personnel with useful information about new or recently expanded firms in North Dakota. It should help in planning future projects and job training. Resources are available in most areas of the state to facilitate economic development, and all areas of the state are actively pursuing new enterprises. While this study provides much business information; however, it does not have detailed worker profile data which would be very helpful in planning job training, technology transfer, and similar activities. In response to this need, a second phase of this project will survey the workers at some of these firms. This survey will provide detailed worker profiles which will be useful to prepare the North Dakota workforce for employment in the future.

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Appendix A

Appendix B

Appendix Table 1. Average Annual Salary for Each Business Type, for New or Recently Expanded Manufacturing, Exportable Services, and Agricultural Processing Firms in North Dakota, for Firms Responding to Economic Development Survey

Category	All Firms			Manufacturing Firms			Exportable Service Firms			Agricultural Processing Firms		
	Employees	Income	Total Income	Employees	Income	Total Income	Employees	Income	Total Income	Employees	Income	Total Income
	-----Dollars-----			-----Dollars-----			-----Dollars-----			-----Dollars-----		
Management	193	36,891.60	7,120,078.80	60	35,131.20	2,107,872.00	37	41,085.60	1,520,167.20	96	32,584.80	3,128,140.80
Clerical	107	16,576.56	1,773,691.92	41	17,312.52	709,813.32	33	15,900.00	524,700.00	33	15,513.36	511,940.88
Engineering	29	33,666.72	976,334.88	15	30,989.16	464,837.40	1	(d)	33,666.72 ^a	13	35,052.00	455,676.00
Sales	111	26,059.20	2,892,571.20	22	31,617.60	695,587.20	58	35,502.20	2,059,127.60	31	33,357.96	1,034,096.76
Machinist/Welder	66	21,278.40	1,404,374.40	66	22,193.60	1,464,777.60	0	--	--	0	--	--
Skilled Labor	245	18,865.60	4,622,072.00	32	18,137.60	580,403.20	180	21,923.20	3,946,176.00	33	22,256.00	734,448.00
General Labor	826	15,142.40	12,507,622.40	296	16,993.60	5,030,105.60	166	14,913.60	2,475,657.60	364	14,788.80	5,383,123.20
TOTAL	<u>1,577</u>		<u>31,296,745.60</u>	<u>532</u>		<u>11,053,396.32</u>	<u>475</u>		<u>10,559,495.12</u>	<u>570</u>		<u>11,247,425.64</u>
Avg. Annual Salary			19,845.70			20,777.06			22,230.52			19,732.33

(d) due to the small number of responses, this value was not reported to avoid disclosure problems.
^a the all firms average income value was used to calculate the engineering total income value for exportable services.

Appendix Table 2. Allocation of Expenditures to the Local Region, Within North Dakota, and Outside North Dakota for New or Recently Expanded Manufacturing, Exportable Services, and Agricultural Processing Firms in North Dakota, Based on Survey Results

Category	All Firms			Manufacturing Firms			Exportable Service Firms			Agricultural Processing Firms		
	Local Reg.	N. Dakota	Other States	Local Reg.	N. Dakota	Other States	Local Reg.	N. Dakota	Other States	Local Reg.	N. Dakota	Other States
-----Percent-----												
Payroll	95.8	95.8	4.2	99.5	99.5	0.5	93.8	100.0	0.0	87.3	87.3	12.7
Benefits	93.6	93.6	6.4	92.5	92.5	7.5	100.0	100.0	0.0	91.7	91.7	8.3
Transportation	48.0	59.4	40.6	63.7	63.7	36.3	60.0	73.0	27.0	37.0	44.3	55.7
Communications	65.5	79.0	21.0	77.5	87.5	12.5	64.2	72.5	27.5	52.5	74.2	25.8
Public Utilities	85.8	88.9	11.1	85.3	94.4	5.6	100.0	100.0	0.0	66.9	75.8	24.2
Wholesale Trade	30.2	43.5	56.5	25.0	50.8	49.2	38.3	56.7	43.3	9.5	22.5	77.5
Retail Trade	55.0	66.5	33.5	56.0	69.0	31.0	55.0	75.0	25.0	53.3	56.7	43.3
Finance	85.8	93.8	6.2	93.3	100.0	0.0	91.7	96.7	3.3	65.0	78.3	21.7
Insurance	68.0	80.0	20.	67.8	88.9	11.1	66.7	66.7	33.3	68.8	75.0	25.0
Real Estate	94.4	94.4	5.6	100.0	100.0	0.0	100.0	100.0	0.0	87.5	87.5	12.5
Business & Personal Service	57.7	74.0	26.0	49.0	70.0	30.0	70.0	90.0	10.0	56.7	66.7	33.3
Professional & Social Service	54.6	60.4	39.6	72.9	72.9	27.1	55.6	70.6	29.4	32.5	37.5	62.5
Contract Construction	74.0	80.0	20.0	100.0	100.0	0.0	100.0	100.0	0.0	56.7	66.7	33.3
Machinery & Equipment	45.2	56.3	43.7	45.0	54.5	45.5	70.0	85.0	15.0	23.3	35.5	64.5
Other	60.2	87.5	12.5	100.0	100.0	0.0	68.3	91.7	8.3	28.0	75.0	25.0

Economic Development Questionnaire

Business Name: _____

Contact Person: _____ Phone No. _____

Address: _____

Describe product(s) produced or primary business activity: _____

Year business started: _____

Year of most recent expansion (if applicable) _____

Was plant facility expanded? (yes/no) _____

If yes, how many square feet were added? _____

What percentage of original floor space does this represent? _____%

Were additional shifts added? (yes/no) _____

If yes, how many new workers did this involve? _____

Number of full-time equivalent employees:

1990 _____ 1992 _____ 1994 _____ currently _____

1991 _____ 1993 _____ 1995 _____

Current employment by job category:

Category	No. of Workers	Workers Hired From Local Area	Wage Range	Average Wage
Management				
Clerical				
Engineering				
Sales				
Machinist/Welder				
General Labor				

Company expenditures for 1995 (or most recent fiscal year):

Category	Total Expenditure	Percent in Local Region ^a	Percent in North Dakota ^b	Percent Outside North Dakota ^b
Payroll	-----\$-----			
Benefits				
Transportation				
Communications				
Public utilities				
Wholesale trade				
Retail trade				
Finance				
Insurance				
Real estate				
Business & personal services				
Professional & social services				
Contract construction				
Machinery & equipment				
Other (specify _____)				

^aLocal region should be assumed to be the trade area within a reasonable distance from your business location including one of the state's larger cities.

^bPercent of expenditures in and outside North Dakota should total 100 percent.

February 22, 1996

Dear Business Owner or Manager:

The Department of Agricultural Economics is conducting a survey of new or expanded firms in the manufacturing, telecommunications, and export service industries to determine the socioeconomic impact in nonmetropolitan areas. A one-page questionnaire (front and back) is enclosed which contains questions regarding your firm's employment and expenditures. Information gathered from the questionnaire will help us estimate economic, demographic, public service, and fiscal impacts for rural areas of North Dakota. Your voluntary participation in this study will help us greatly, and we ask you to complete the enclosed questionnaire. Please return the completed questionnaire in the self-addressed envelope provided. All information provided on the questionnaire will remain strictly CONFIDENTIAL. Only group comparisons will be made and reported in summary form.

If you have any questions regarding the survey, please contact me (701-231-7455) or Randal Coon at 701-231-1018.

Thank you for your help in making this a successful research project. If you would like a copy of the research results, please indicate so on the questionnaire.

Sincerely yours,

F. Larry Leistritz
Professor

FLL/cjj

Enclosure