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MEASUREMENT OF VOLATILITY

OF INDUSTRIAL EMPLOYMENT

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Introduction

In February 1975, the Detroit metropolitan area unemployment rate stood at 16.4 percent while the nation experienced 8.2 percent unemployment. Obviously, unemployment rates will not be identical in every state of the union, however, it is legitimate to ask why Michigan unemployment is so much higher than the national average. Furthermore, it is quite a legitimate goal for having the highest unemployment rate. An examination of unemployment data¹ reveals that demography is very important in explaining varying unemployment rates. Historically, teenagers, females, and racial minorities have experienced greater-than-average rates of unemployment. This is no reason, however, to believe that Michigan is endowed with an overwhelming proportion of teenagers, females, or racial minorities. We must therefore look at the industrial composition of the Michigan economy as a source of explanation.

The industrial structure of Michigan has been the subject of numerous studies² and will not be discussed here. The wealth of data and experience of state development agents indicate that heavy manufacturing industries in Michigan have contributed to the hypersensitivity

¹U.S., Department of Labor, Bureau of Labor Statistics, Employment and Earnings: United States, 1909-72, Bulletin No. 1312-9. Washington, D.C.: U.S. Government Printing Office, May 1975.

²See Steven B. Sobotka, Profile of Michigan (New York: Free Press of Glencoe, 1963); and W.R. Thompson, W.R. and J.M. Mattila, An Econometric Model of Postwar State Industrial Development, Detroit, Mich. Wayne State University Press, 1959. Also see Michigan in the 70s: An Economic Forecast, Ann Arbor, Mich.: Bureau of Business Research, Graduate School of Business Administration, University of Michigan, 1965.

of Michigan employment to national business cycles. Development agents are well aware of this problem, and, whenever possible, they try to balance the Michigan labor force by encouraging the growth of service and office jobs.

Cyclicalities of employment in manufacturing industries, even though recognized, has not received a detailed, quantitative treatment in the literature. The purpose of the present paper is to (1) develop a quantitative measure of sensitivity of industry employment to business cycles; (2) compute such a measure for selected industries; and (3) use the above measures in conjunction with criteria developed by the Economic Development Administration (EDA) to identify certain industries or industry groups as ideal candidates for further industrial development in the state.

The paper is organized into three sections. The first section will deal with the methodological details of measuring sensitivity to business cycles. The second section will be devoted to reporting the computed measures of cyclicalities for specific industries. The final section will be devoted to reporting industries which constitute ideal candidates for the less developed areas of Michigan.

SECTION 1

Measuring Cyclical Sensitivity

This section will relate the employment movements within particular industries to employment movements in total nonagricultural employment in the United States. The main methodology is simple linear regression. The measure of cyclical sensitivity developed here is hoped to be of some practical use to state development agents and the Michigan Department of Commerce in their future efforts at selecting specific industries for promotion in the state.

A look at some data

Figure 1 shows total nonagricultural employment in the United States for every month from January 1947 to June 1972. The data is seasonally adjusted and is taken from Employment and Earnings: United States, 1909-1972 published by the Bureau of Labor Statistics (BLS). The shaded months are periods of recession as defined by the National Bureau of Economic Research. Figure 2 and Figure 3 show two components of total employment-- manufacturing and services.

The three graphs exhibit pronounced differences in volatility. Manufacturing shows the most volatility while services seem to be unaffected by business cycles. Table 1 summarizes the behavior of the three time series in the officially recognized postwar recessions.

Table 1

CHANGES IN EMPLOYMENT IN MANUFACTURING SERVICES AND TOTAL NON-
AGRICULTURAL SECTOR IN POSTWAR RECESSIONS

<u>Period of Recession</u>	<u>Annualized Percentage Change</u>		
	<u>Total Nonagr.</u>	<u>Manufacturing</u>	<u>Services</u>
Dec. '48 - Oct. '49	-2.78	-5.37	.372
Aug. '53 - Aug. '54	-1.49	-4.45	1.090
Aug. '57 - Apr. '58	-2.69	-5.77	-.137
June '60 - Feb. '61	-1.11	-3.19	1.050
Dec. '69 - Nov. '70	-0.656	-4.19	1.150
Average	-1.75	-4.59	.705

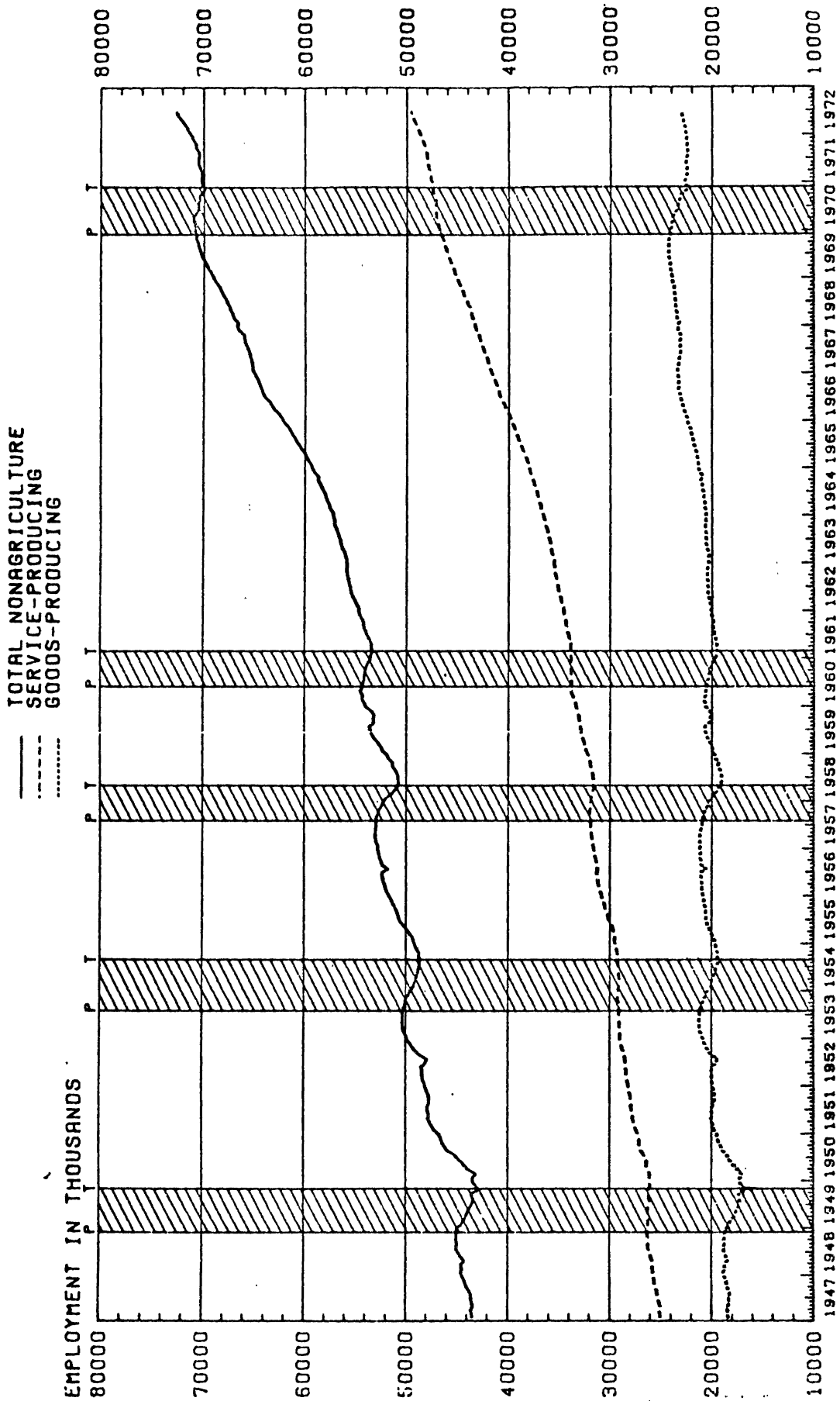


Fig. 1. Nonagricultural payroll employment, seasonally adjusted.

Source: BLS, Employment and Earnings in the United States, 1909-1972, Washington, D.C.: Government Printing Office, 1972.

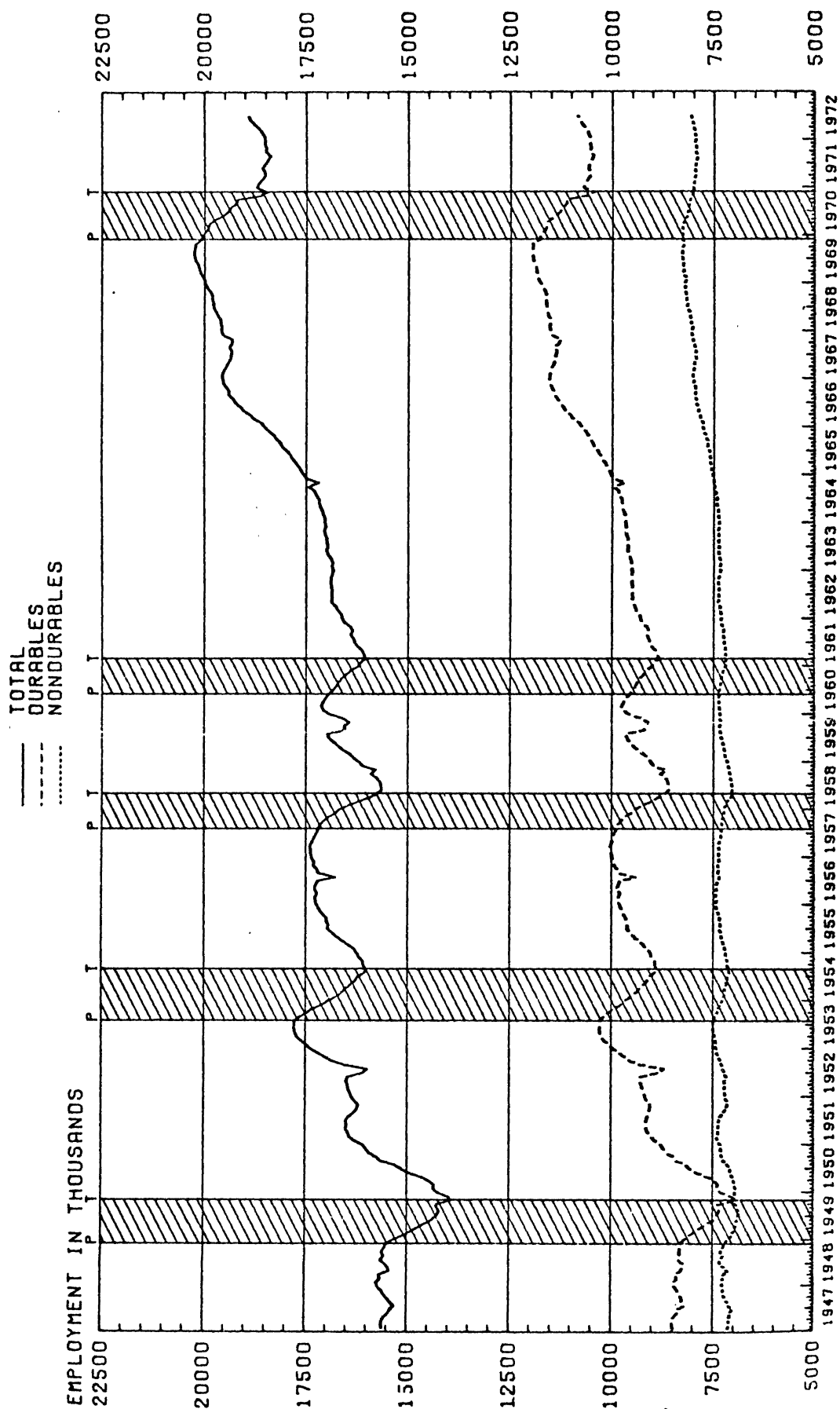


Fig. 2. Manufacturing, seasonally adjusted.

Source: BLS, Employment and Earnings in the United States, 1909-1972, Washington, D.C.: Government Printing Office, 1972.

The data in Table 1 indicate that the loss of jobs during recessions is more than twice as severe in manufacturing as it is in total non-agricultural employment. The service sector seems to escape the influence of recessions and even scores some gains during such periods.

In present form, the average annual decline figures could be construed as a measure of sensitivity. There are some drawbacks to such a measure, however. First, the overall positive trend in all components of employment is not taken into account. A real decline of 2.69 percent in total employment is really more serious than the simple percentage would have us believe. The long-run trend in employment is near 3 percent, so the real annual loss of 2.69 percent between August 1957 and April 1958 represents a 5.7 percent annual rate of decline from the expected level of total employment. The second drawback is that the measures constructed in Table 1 depend only on the peaks and troughs of employment; they disregard the variations in employment within the intervening months. Even though this may not be too serious in recessionary periods (which are usually of shorter duration than expansionary periods), fluctuations within expansionary periods will prove this particular measure ineffective.

The problem of long-run trends can be dealt with effectively if we transform the three time series to monthly percentage changes. The reader can satisfy himself by reviewing the plot of the three transformed time series in Figure 4. Due to the nature of the plot routine used, Figure 4 continues for several pages, which somewhat limits its usefulness. Nevertheless visual inspection should satisfy most readers that each one of the three transformed series lacks any long-term trend.

CASE NO.		305 CASES FOR THIS GRAPH																									
1	+									12	3																
2	+									1	2	3															
3	+								X		3																
4	+								1		2	3															
5	+								1		X																
6	+								1	2		3															
7	+										3	2	1														
8	+											X	3														
9	+												X	1													
10	+												X	1													
11	+												3	2	1												
12	+												3		X												
13	+												1	2	3												
14	+														123												
15	+												1	2		3											
16	+														1	3	2										
17	+																3X										
18	+																32	1									
19	+																1	2	3								
20	+																		231								
21	+																		1	32							
22	+																			1	23						
23	+																			1	2	3					
24	+																			1	23						
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29	+																			1	2	3					
30	+																			1	2	3					
31	+																					321					
32	+																					321					
33	+																					X	1				
34	+																					3	1	2			
35	+																					3		2		1	
36	+																					3	2		1		
37	+																					2		1	3		
38	+																						3		1		2
39	+																							3	2	1	
40	+																							3	2		1
41	+																							3	2	1	
42	+																							3	2	1	
43	+																							3		2	1
44	+																							3	2	1	
45	+																							3	2		1

Fig. 4. Monthly percentage changes in manufacturing, total, and services employment, Jan. 1947 - June 1972.

146	+				32	1		
147	+					X		
148	+				32	1		
149	+				32	1		
150	+				3	21		
151	+	1		2		3		
152	+				X	3		
153	+		1	2		3		
154	+					32	1	
155	+					3	2	1
156	+					23	1	
157	+					123		
158	+			1	X			
159	+				1			
160	+			X		3	23	
161	+		1	2	3			
162	+			1	2	3		
163	+				1	23		
164	+				1	2	3	
165	+		1	2		3		
166	+			1	2		3	
167	+		1		2	3		
168	+			1	2	3		
169	+				1	2	3	
170	+					X	3	
171	+					X	1	
172	+					3	2	1
173	+						X	3
174	+					123		
175	+					2X		
176	+		1	2		3		
177	+					X	1	
178	+						23	1
179	+					21	3	
180	+					21	3	
181	+						X	2
182	+					213		
183	+					32	1	
184	+				1	2	3	
185	+					X	3	
186	+				1	23		
187	+					12	3	
188	+					123		
189	+					X		
190	+				1	23		
191	+					X	3	
192	+					X	1	
193	+				1	X		
194	+					X	3	
195	+						3X	

Fig. 4. (Cont.)

196	+				2X			
197	+				1 2 3			
198	+				1X			
199	+				12 3			
200	+				123			
201	+				12 3			
202	+				123			
203	+				X3			
204	+				X 3			
205	+				1 32			
206	+				2X			
207	+				123			
208	+				12 3			
209	+				12 3			
210	+				2X			
211	+				1X			
212	+				X 1			
213	+	1		2	3			
214	+			3		2		1
215	+				321			
216	+				2 X			
217	+				X2			
218	+				X			
219	+				2X			
220	+				1X			
221	+				X1			
222	+				231			
223	+				X2			
224	+				X1			
225	+				X			
226	+				32 1			
227	+				1X			
228	+				2X			
229	+				X 1			
230	+				3X			
231	+				X 1			
232	+				X			
233	+				X			
234	+				X3			
235	+				2 31			
236	+			1	23			
237	+				X3			
238	+				X3			
239	+				1 23			
240	+				1 23			
241	+			1	2 3			
242	+			1	2 3			
243	+			1	2 3			
244	+			1	2 3			
245	+				1 2 3			

Fig. 4. (Cont.)

246	+		1	23		
247	+			X3		
248	+		1	2 3		
249	+			X3		
250	+				X	1
251	+			123		
252	+		21	3		
253	+			1 X		
254	+			1X		
255	+			321		
256	+			X 3		
257	+			X 3		
258	+			1 23		
259	+			123		
260	+			132		
261	+			12 3		
262	+			12 3		
263	+			123		
264	+		1	2 3		
265	+			2X		
266	+			X 3		
267	+			1 X		
268	+			1X		
269	+			3X		
270	+			12 3		
271	+			1 23		
272	+			12 3		
273	+			1 2 3		
274	+		1	2 3		
<hr/>						
275	+			123		
276	+		1	2 3		
277	+		1	2 3		
278	+			1X		
279	+		1	2 3		
280	+	1		2 3		
281	+		1	23		
282	+			1 23		
283	+		1	2 3		
284	+			1 2 3		
285	+1		2	3		
286	+		1	2 3		
<hr/>						
287	+			3 2		1
288	+		1	23		
289	+		1	X		
290	+		1	2 3		

Fig. 4. (Cont.)

Before proceeding with further analysis, we should look at some interesting aspects of the data presented in Figure 4. [Symbols 1, 2, 3 are used for manufacturing, total, and services, respectively.]

- (1) Manufacturing employment seems to be more volatile than the other two, confirming our earlier suspicions.
- (2) Services employment seems to be less volatile than the total employment.
- (3) Volatility of all three series seems to be greater during recessions than during expansionary periods.

The above hypotheses will be tested later. Tables 2 - 4 present some descriptive measures for the three series in Figure 4.

Table 2

DESCRIPTIVE MEASURES FOR MONTHLY PERCENTAGE CHANGES IN
MANUFACTURING, SERVICES, AND TOTAL EMPLOYMENT FOR RECESSION
(NBER DEFINITION) MONTHS, 1947-1972; N = 54

	<u>Manufacturing</u>	<u>Services</u>	<u>Total</u>
Mean percentage change in employment	-.81	.15	-.29
Standard deviation of percentage changes	.79	.23	.35
Coefficient of variation	-.77	1.53	-1.21
Minimum	-2.94	-0.86	-1.97
Maximum	0.53	.62	.38

Table 3

DESCRIPTIVE STATISTICS FOR MONTHLY PERCENTAGE CHANGES IN
MANUFACTURING, SERVICES, AND TOTAL EMPLOYMENT FOR EXPANSIONARY
PERIODS IN 1947-1972; N = 251

	<u>Manufacturing</u>	<u>Services</u>	<u>Total</u>
Mean	.25	.33	.27
Standard deviation	.67	.20	.33
Coefficient of variation	2.68	.61	1.22
Minimum	-2.61	-.46	-1.28
Maximum	3.55	.91	1.57

The coefficient of variation normally serves as an adequate measure of variability. Unfortunately the month-to-month percentage changes (especially in services) are so close to zero that the coefficient of variation cannot serve our purpose.

Correlation analysis

So far we have looked at possible absolute measures of volatility. We now turn attention to measurement of volatility in relation to the general volatility of total employment. Figure 5 is a scatter diagram of monthly percentage changes in manufacturing versus those in total nonagricultural employment in recession months. A strong positive relationship is indicated. One word of explanation must be injected here, lest the reader attributes the above relationship to the fact that manufacturing employment is a part of total employment and summarily dis-

misses the methodology being used as improper. Manufacturing is a sizeable proportion of the total employment, and thus part of the criticism is well founded; however, manufacturing and services together account for less than 50 percent of total employment so that all of the association between manufacturing and total employment cannot be attributed to lack of freedom of the series to move independently. Moreover, we have chosen manufacturing and services as extreme illustrative examples. The prescribed methodology will be applied to specific industries, which will constitute minute fractions of the total nonagricultural sector, and hence the lack of freedom of movement will not be a problem.

The degree of linear association between two random variables is commonly described by the correlation coefficient. This measure is a real number between -1 and 1 and, in a sense, signals the existence or lack of a straight line around which a sizeable proportion of probability mass is concentrated. A coefficient equal to 1 would indicate that the entire probability mass of the joint distribution of two random variables is concentrated on a straight line. The sign of the coefficient signifies whether the two variables on the average move in the same direction (+) or in the opposite direction (-). A zero coefficient indicates the lack of linear association between the two variables. Table 4 is a matrix of sample coefficients of correlation for the three variables under consideration within 54 recession months.

Table 4

SIMPLE CORRELATION COEFFICIENTS

Manufacturing	1.00		
Services	.2429	1.00	
Total	.8353	.4421	1.00
	Manufacturing	Services	Total

The Table 4 coefficients are sample values computed on the basis of 54 observations. Because of sampling errors, they may not exactly equal the real correlation among the variables. It is not necessary, however, to know the real magnitude of the coefficient of correlation to statistically reject or accept the hypothesis that there is no linear association between any two of the variables and that the observed relation is strictly due to chance. In the above example, if we were to take repeated independent samples of size 54, we would expect to find computed correlation coefficients with magnitudes larger than 0.2681 in only five out of every 100 sampled.¹ So, at the 5 percent significance level we reject the hypothesis of no linear association for all variables except services versus manufacturing employment.

¹0.2681 is obtained by solving the equation $t = r\sqrt{n-2/1-r^2}$ for r, setting n = 54 and $t = t_{.025}^{52}$.

It is very unlikely we will find (even at a specific industry level) many industries that bear no association or negative association with the total economy. If we did find such industries, we could very well stop and choose the industry as a candidate for state industrial development. Our task does not end when some positive correlation is indicated, however. The existence of the positive correlation coefficient indicates only that there is some straight line with positive slope around which sizable probability of the joint distribution of the two variables is concentrated. The coefficient does not tell us where the line is located. Naturally, if we find out that the slope of the line is less than 1, we will want to consider such industry for future industrial development in the state because, even though the employment in such industry moves up and down with the business cycles, its movements are, on the average, smaller than those of the aggregate employment and thus could lend relative stability to the regional employment. On the other hand, if the slope of such line is greater than 1, we would want to reject the industry on the basis that its cyclical movements amplify the national cycles and hence would have a destabilizing effect on regional employment.

The following section employs regression to discover the slope of the line which was not revealed by the correlation coefficient. Since the slope is intimately related to the coefficient of correlation, we could compute it by appropriately scaling the coefficient of correlation. The use of a regression routine, however, does provide useful statistics for testing hypotheses related to the slope.

Regression Analysis

A regression line is estimated for the data shown in Figure 5 with the following results:

$$Y_m = -0.00401 + 1.392 Y_T$$

where Y_m and Y_T are the monthly percentage changes in manufacturing and total employment, respectively. Both coefficients are significantly different from zero at the .0001 level. Coefficient of determination is .70. Standard error of estimate equals .0033. Standard error of $\hat{\beta}$ equals 0.12704.

Interpretation of the regression equation

During recessions, whenever total nonagricultural employment experiences a monthly percentage change equal to k we expect manufacturing employment to change by a percentage equal to $-0.00401 + 1.392 k$. If $k = +.5$ percent, our expectation of the percentage change in manufacturing employment will be $+.69$ percent. Notice that in this example a positive change is considered. This is not impossible, even in recessionary periods. It is important to remember that even though our sample is restricted to recession periods, there were no restrictions on the direction of change within such periods.

Even though the estimated regression equation provides us with the expected percentage change in manufacturing employment as a function of percentage change in general employment, it does not provide any information about the degree of error possible using the regression equation. Given that total employment during some recession changes by .5 percent, is it likely that manufacturing employment will change by 2 percent?

Is it likely that it will not change at all, or possibly decrease by .75 percent? Naturally the answers to these questions lie in the manner in which the data points in Figure 5 are scattered around the regression line. If the points are located tightly around the line, we intuitively know it would be unlikely that future observations would deviate from the line to a great extent. On the other hand, if wide deviations from the line are numerous in the scatter diagram, we have reason to believe that such deviations will be commonplace in the future. The standard error of estimate is the measure that quantifies the above reasoning. The greater the standard error of estimate, the wider will be the deviations from the expected using the regression equation. In fact we can go further and state the probability is $(1 - \alpha)$ that a single future observation on monthly change in manufacturing will fall within $\pm k \hat{\sigma}$ of the value given by the regression equation where $\hat{\sigma}$ is the standard error of estimate and k is a quantity that can be calculated using only sample information and α once they are known.

Testing hypothesis

If the regression coefficient of the total employment is to be used as a screening device to discriminate between cyclical and non-cyclical industries, we need to have a decision rule based on the $\hat{\beta}$ value and the $\hat{\sigma}$ value of a particular industry. The particular $\hat{\beta}$ value may be estimated using data on recession months (if sensitivity in such periods is considered more undesirable than sensitivity in other periods). For example, we need a rule which would classify an industry as "sensitive" or "cyclical" if $t > 1.1$ and "unsensitive" otherwise, where t (or z for cases where $n > 30$) is a statistic to be calculated from sample data.

In applications of simple linear regression, the usual hypothesis tested is a hypothesis of the equality of $\hat{\beta}$ to zero. In our application the situation is a little different. If we started on a search of industries with $\hat{\beta}$ coefficients of zero, our search would turn up very few industries, if any at all. We must recognize that what we are after is not industries having absolutely no sensitivity to overall business cycles, but rather industries whose cycles have smaller magnitudes than the national cycles. So our null hypothesis then becomes $H_0: \beta < 1$ and the alternate hypothesis $H_1: \beta \geq 1$. Note that standard regression routines compute a t statistic only for $H_0: \beta = 0$. Recalculation of the t statistic appropriate for our null hypothesis is quite simple and involves reducing the estimated β by one and dividing the result by the standard error of $\hat{\beta}$.

Before picking a decision rule we must evaluate what kind of risk of error we are willing to accept. In the present situation we can make an error and classify a stable industry as cyclical (type I error) or classify a cyclical industry as stable (type II). Conversation with development agents quickly reveals where their sentiments lie. They invariably favor a lower risk of type I error at the expense of increased type 2 error. The reasoning is usually based on the judgment that we should not let any stable industry slip through our fingers. If this means that once in a while we encourage industries that are not really stable, the effect will not be all that bad since even an unstable industry will provide jobs in the short run. It is my opinion that the above reasoning will only invite more severe unemployment in the next recession; thus more attention should be given to type II error and exceedingly smaller α levels

should be avoided. With a given sample size, obviously we cannot lessen both types of risk; for illustration purposes 0.05 is chosen here as the tolerable maximum risk of type I error. From the table of z distribution, 1.645 is chosen as the cutoff point.

Let us now test to see whether we would reject or accept an industry having the variation characteristic of the manufacturing employment data shown in Figure 5.

$$H_0: < 1$$

$$H_1: \geq 1$$

$$\alpha = 0.05$$

decision rule: reject H_0 if $z > 1.645$

$$z = \frac{1.392 - 1.0}{0.12704} = 3.09 \Rightarrow \text{reject } H_0.$$

Obviously, this rejection should not come as a surprise. We have known all along that cyclicalness of employment is much more pronounced within manufacturing than in total employment. We have just used this data for convenience of illustration. Imagine, however, if the industry under consideration would have been "men's knit shirts." It is not immediately obvious (even to development experts) whether this particular industry is more or less cyclical than the aggregate economy. The hypothesis testing methodology described will make this an effortless task.

Figure 6 is the scatter diagram of services employment versus total employment. At first glance the scatter seems to be of greater slope and wider deviation than Figure 5. The readers should consider the difference in the y axis scale. The regression equation is:

$$Y_S = 0.00233 + .291Y_T$$

where Y_S and Y_T are the percentage monthly changes in services and total employment in the 54 postwar recession months. Both coefficients are significantly different from zero at .001. Coefficient of determination (r^2) is equal to 19.5 percent and the standard error of estimate is .002. Standard error of $\hat{\beta}$ is equal to 0.082.

$$H_0: \beta < 1$$

$$H_1: \beta \geq 1$$

$$\alpha = 0.05$$

decision rule: reject H_0 if $z > 1.645$

$$z = \frac{0.291 - 1}{0.082} = -8.65 \Rightarrow \text{do not reject } H_0.$$

Employment changes in recessions vs. expansions

So far this analysis has been confined to only 54 months of recession in the U.S. postwar history. The reason for this should be obvious. It is precisely during such recessionary periods when industrial states suffer unemployment far surpassing the national average. Our aim in screening for stable industries is to help bring Michigan closer to the nation during recessions as opposed to its current state which is twice as cyclical as the nation.

But what about expansions? Ideally we would like to find industries with high peaks and very small valleys to promote in the state. This accomplishment would still cause high cyclicality, but it all would be concentrated in the boom periods. Michigan would grow much faster than the rest of the nation during expansions and suffer no disproportionate unemployment during recessions.

Unfortunately this seems to be the impossible dream. Volatile industries are volatile during recessions as well as expansions. Figures 7 and 8 show the scatter diagrams for the manufacturing and service sectors during all the months that are not within the recessionary period. The regression results for the two scatter diagrams are given in Tables 5 and 6, respectively. In the study of specific industries, we will not stratify recession vs. nonrecession for two reasons. First, as the analysis indicates, the likely outcome is going to be that the β coefficient for a given industry will be higher or lower than one in both recessions and expansions. Second, at specific industry levels, some series start with 1958 or even 1964, affording only the eleven month recessionary observation in 1970 which would not be an adequate sample size.

Discussion of type II error

Earlier in this paper we suggested that in screening industries on the basis of their employment sensitivity to the national business cycles, it would be necessary to keep type II errors (as well as type I errors) at reasonable levels. It should be obvious that the smaller α level we choose, the larger the cutoff point will be for the computed z statistic. With $\alpha = .05$ and a sample size of 54, the cutoff was 1.645. Reducing α is like using a wider net to catch more and more stable industries for state development. Unfortunately, smaller values of α would end up classifying virtually every industry as a stable one. Another way of saying the same thing is that indexes of cyclicity could be used as a screening device as long as some industries pass and some fail the screening test. Setting the α level so small that every industry passes is having no screening at all.

Let us now consider the probability of a type II error. If indeed $\beta = 1.2$, what is the probability that our test for the data in Figure 5 will fail and classify such an industry as stable? The answer is given by

$$N \left(\frac{1.645 - 1.2}{0.12704} \right) = N(3.5) = 0.9998.$$

Even if $\beta = 1.5$, we still run a $N(1.14) = 0.8729$ risk of misclassifying a $\beta = 1.5$ industry as a stable industry. Obviously, given the number of observations, with $\alpha = 0.05$ we face the possibility of serious type II errors. If we choose $\alpha = 0.10$ in the above example, the cutoff point would have been 1.28. Then, the probability of incorrectly classifying $\beta = 1.2$ as stable would be 53 percent and probability of incorrectly classifying $\beta = 1.50$ as stable would be $N(-1.73) = 4.18$ percent. In section II $\alpha = .10$ will be applied to specific industries.

Seasonal adjustments in industry employment data

In this study, there is a question as to whether we should use seasonally adjusted or unadjusted data. The answer to this question lies in the objective of the screening. If the objective is the selection of industries which are seasonally less volatile than the national economy, then we should not forget seasonal variations and should work with unadjusted data. Our aim, however, is screening of industries in search of those which are not very sensitive to national business cycles; hence we should work with seasonally adjusted data. In other words, if an industry has a very seasonal pattern of employment, yet does not exhibit much sensitivity to business cycles, we would want to include it among the list of stable industries.

Some industry employment data provided by the Bureau of Labor Statistics is already seasonally adjusted. Those series which are provided without such adjustment will be adjusted using the X-11 program originally published by the Bureau of the Census.²

In the next section, a list of stable and unstable ($\beta < 1$ vs. $\beta > 1$) industries are given. Testing of the hypothesis was carried out at $\alpha = .10$. Data for each series covered the period January 1958-June 1972. The list of SIC codes are from 1967. Since an SIC title tape was not available for matching with the SIC numbers, only the numbers are given in the next section.

²The author extends his thanks to Professor W.A. Spivey for making the MTS version of the program available and to Craig Ansley for making the necessary adjustments in the program and putting it in subroutine form.

SECTION 2

List of Cyclical and Noncyclical SIC Industries

The hypothesis-testing methodology of Section 1 was applied to every SIC industry for which the Employment and Earnings: United States, 1909-1972 provided total employee data for the period January 1958 to June 1972. The risk of type I error, i.e., classifying a stable industry as unstable, was held at .10.

The tables provided here suggest that our search has not been in vain. The popular notion that manufacturing is unstable and services are stable is challenged by our noncyclical list which contains many manufacturing industries. Represented among the noncyclical are industries from SIC 26, 28, 33, 34, 35, 37 --all long accepted as cyclical. Supporting documents (computer outputs) accompany this report.

Table 5

INDUSTRIES WITH LESS THAN AVERAGE CYCLICAL STABILITY

1000	2511	3368	3544	3690
1010	2540	3390	3545	3694
1380	2580	3391	3549	3700
1400	2890	3400	3550	3710
1420	3000	3420	3552	3711
1440	3050	3427	3555	3712
1500	3070	3429	3560	3713
1600	3200	3440	3561	3714
1610	3211	3441	3562	3728
1620	3250	3444	3566	3732
1700	3270	3449	3590	3740
1720	3280	3450	3600	3780
1740	3287	3451	3610	3800
1760	3300	3452	3611	3820
2241	3310	3461	3612	3821
2270	3312	3470	3620	3822
2290	3320	3481	3621	3830
2370	3321	3490	3622	3870
2390	3322	3500	3630	3960
2400	3323	3519	3634	4000
2420	3330	3530	3640	4011
2421	3350	3531	3642	5300
2440	3351	3533	3643	5330
2441	3357	3535	3650	5600
2500	3360	3540	3670	5620
2510	3361	3541	3679	5650
				5660

S.I.C. classification

Table 6

INDUSTRIES WITH CYCLICAL STABILITY
SURPASSING THE NATIONAL AVERAGE

1020	2121	2515	2911	3662	4930	6320
1200	2200	2520	2980	3671	4980	6330
1300	2211	2600	3011	3720	5000	6400
1310	2221	2610	3100	3721	5010	6500
1710	2231	2631	3111	3722	5020	6560
1730	2250	2640	3140	3730	5030	7000
1900	2251	2643	3180	3731	5040	7010
1920	2252	2650	3187	3811	5060	7200
1925	2253	2651	3220	3835	5070	7210
2000	2254	2653	3221	3840	5080	7300
2010	2260	2700	3229	3861	5090	7310
2011	2280	2711	3241	3900	5200	7320
2013	2300	2721	3251	3910	5310	7800
2015	2311	2730	3260	3940	5320	7810
2020	2320	2750	3352	3944	5400	7840
2024	2321	2751	3411	3949	5410	8000
2026	2327	2752	3430	3950	5500	8060
2030	2328	2780	3431	3990	5510	8110
2031	2330	2790	3433	3993	5530	8200
2032	2331	2800	3442	4100	5540	8210
2037	2335	2810	3443	4110	5610	8220
2040	2337	2812	3494	4120	5700	8900
2041	2339	2818	3510	4130	5710	8910
2042	2340	2819	3511	4200	5800	9100
2050	2341	2820	3522	4220	5900	9110
2051	2342	2821	3551	4500	5910	9120
2052	2350	2825	3570	4510	5960	9130
2060	2360	2830	3580	4600	5980	9200
2070	2361	2834	3585	4800	6000	9210
2071	2391	2840	3618	4810	6100	9220
2080	2411	2841	3632	4820	6120	9300
2082	2430	2844	3633	4830	6140	9310
2086	2431	2850	3641	4900	6200	9320
2090	2432	2870	3660	4910	6300	9500
2100	2490	2871	3661	4920	6310	9600
2111	2512	2900				

S.I.C. classification

SECTION 3

Specific Industries for Michigan

In 1973 the Office of Economic Development Administration, U.S. Department of Commerce, published the grouped results of a survey entitled "Industrial Location Determinants." Manufacturing establishments were surveyed to determine the critical and noncritical requirements of each industry (five-digit product class level) for locating in a geographical area.

Since the publication of the report, the EDA has matched various industries to the profiles of certain less-developed regions of the nation with the hope that such matching may be used by development agents to zero in on target industries. The matching was done by an ad hoc scoring rule.¹ For a geographical area to be matched with an industry, the area would have to satisfy all the critical requirements of the industry. The noncritical requirements were used to determine various degrees of perfection of the match. Specifically, industries with scoring values of 90-100 were considered grade A, 80-90 grade B, etc.

Whether the EDA used cyclical stability as a criterion in selecting industries for certain areas is not known. (Even if we assumed such a criterion was used, the weight given to it would still be unknown.) In this section, the industries chosen as

¹The EDA's methodology for matching the survey results to various locations is not documented and not published. Information included here is from informal telephone conversations with EDA officials.

grade A industries for upper and upper lower Michigan are subjected to further screening based on the cyclical sensitivity described earlier in this paper.

First, it should be mentioned that all EDA selections are at the five-digit SIC level, for which published employment data do not exist. Our screening was, of necessity, conducted at the four-, three-, and in certain cases the two-digit levels. For example, one of the grade A industries for the community of Iron Mountain was 22561-warp knit fabrics. Our employment data did not provide five-digit breakdowns, hence we looked among the list of cyclical and noncyclical industries from the previous section. The aim was to exclude the industry from the list of potential Michigan industries if 2256 showed up among the cyclical industries, and to include the industry if it showed up among the noncyclical industries. Unfortunately 2256 does not appear in either list. As a result we look for 225 which is listed as a noncyclical industry in the tables of Section 2, and hence we accept the industry. On page 1 of the EDA selection report we placed a 3 to the left-hand side of SIC 22561 as a reminder that this industry was accepted by virtue of SIC 225 being declared noncyclical in the tables. The same problem arose with industries being rejected as cyclical. For example SIC 35672 is marked as 3★ where the 3 again signifies that the closest SIC code in our Section 2 tables was SIC 356, and where the ★ signifies that 356 appeared among our list of unstable industries.

The illustrative screening was done only for grade A industries; however the complete EDA report² accompanies this paper. Documents supporting the Section 2 tables are also enclosed.

²The author extends his thanks to Leonard Bronder of the Michigan Department of Commerce for making this report available.

INDUSTRY RANKING BY GRADE FOR THE NORTHEAST MICHIGAN
GROWTH COMMUNITY IS ALPENA MICHIGAN

EDD PAGE 1

THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0
AND 100.0 % OF THE TOTAL POSSIBLE SCORE)

- 3 SIC - 22562
NAME - CIRCULAR KNIT FABRICS
PCT OF TOTAL - 100.0
- 3 SIC - 25221
NAME - METAL OFFICE SEATING ETC
PCT OF TOTAL - 99.1
- 3 SIC - 27521
NAME - MAGAZINE AND PERIODICAL LITHOGRAPHIC PRINTING
PCT OF TOTAL - 92.6
- 4 SIC - 27994
NAME - PACKAGING AND SHIPPING CONTAINERS
PCT OF TOTAL - 92.5
- 3 SIC - 34211
NAME - CUTLERY SCISSORS SNEAKS TINKERS AND SNIPS
PCT OF TOTAL - 100.0
- 4 SIC - 34993
NAME - OTHER METAL VALVES FOR PIPING SYSTEMS AND EQUIP
PCT OF TOTAL - 91.1
- 4 SIC - 35179
NAME - PARTS AND ACCESSORIES FOR INTERNAL COMBUSTION E
PCT OF TOTAL - 91.1
- 3 SIC - 35370
NAME - INDUSTRIAL TRUCKS TRACTORS TRAILERS STACKERS AN
PCT OF TOTAL - 100.0
- 4 SIC - 35451
NAME - SMALL CUTTING TOOLS FOR MACHINE TOOLS
PCT OF TOTAL - 100.0
- 2 SIC - 27611
NAME - MANIFOLD BUSINESS FORMS CONTINUOUS
PCT OF TOTAL - 90.7
- 4 SIC - 33610
NAME - ALUMINUM AND ALUMINUM BASE ALLOY CASTINGS
PCT OF TOTAL - 91.3
- 3 SIC - 34231
NAME - MECHANICS HAND SERVICE TOOLS
PCT OF TOTAL - 92.5
- 4 SIC - 34995
NAME - METAL FITTINGS FLANGES AND UNIONS FOR PIPING SY
PCT OF TOTAL - 91.5
- 4 SIC - 35227
NAME - LAWNMOWERS AND SNOW BLOWERS
PCT OF TOTAL - 92.3
- 4 SIC - 35912
NAME - DRILLING MACHINES
PCT OF TOTAL - 92.4

INDUSTRY RANKING BY GRADE FOR THE NORTHEAST MICHIGAN
GROWTH COMMUNITY IS ALPENA MICHIGAN

END

PAGE 2

THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0
AND 100.0 % OF THE TOTAL POSSIBLE SCORE, CONT.)

4★	SIC - 35453 NAME - OTHER ATTACHMENTS AND ACCESSORIES FOR MACHINE T PCT OF TOTAL - 90.1	3★	SIC - 35683 NAME - PLASTIC-WORKING MACH AND EQUIP AND PARTS PCT OF TOTAL - 100.0
4★	SIC - 35621 NAME - BALL BEARINGS(COMPLETE) PCT OF TOTAL - 100.0	4★	SIC - 35623 NAME - OTHER ROLLER BEARINGS COMPLETE PCT OF TOTAL - 95.6
4	SIC - 35857 NAME - OTHER REFRIGERATION AND AIR CONDITIONING EQUIPM PCT OF TOTAL - 90.7	4★	SIC - 36112 NAME - TEST EQUIPMENT FOR TESTING ELECTRICAL RADIO AND PCT OF TOTAL - 92.6
4★	SIC - 36113 NAME - OTHER ELECTRICAL MEASURING INSTRUMENTS PCT OF TOTAL - 90.0	4★	SIC - 36220 NAME - GENERAL INDUSTRY POWER CIRCUIT DEVICES AND CONT PCT OF TOTAL - 94.1
4★	SIC - 36241 NAME - ELECTRIC FANS PCT OF TOTAL - 92.5	4★	SIC - 36422 NAME - COMMERCIAL AND INSTITUTIONAL TYPE ELECTRIC FIXT PCT OF TOTAL - 91.8
4	SIC - 36621 NAME - COMMERCIAL INDUSTRIAL AND MILITARY ELECTRONIC C PCT OF TOTAL - 100.0	4★	SIC - 36793 NAME - RESISTORS FOR ELECTRONIC APPLICATIONS PCT OF TOTAL - 93.3
2★	SIC - 37910 NAME - TRAILER COACHES PCT OF TOTAL - 100.0	3★	SIC - 38211 NAME - OPTICAL INSTRUMENTS AND LENSES PCT OF TOTAL - 91.2
3★	SIC - 38312 NAME - SIGHTING AND FIRE CONTROL EQUIPMENT MADE FROM L PCT OF TOTAL - 92.0	3	SIC - 38410 NAME - SURGICAL AND MEDICAL INSTRUMENTS APPARATUS AND PCT OF TOTAL - 92.4

GROWTH COMMUNITY IS SAULT STE MARIE MICHIGAN

THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0 AND 100.0 % OF THE TOTAL POSSIBLE SCORE)

3 SIC - 22532
NAME - CIRCULAR KNIT FABRICS
PCT OF TOTAL - 91.0

3★ SIC - J5593
NAME - PLASTIC WORKING MACH AND BRUIP AND PARTS
PCT OF TOTAL - 100.0

3 SIC - 26221
NAME - METAL OFFICE SEATING ETC
PCT OF TOTAL - 90.0

4★ SIC - 36113
NAME - TEST EQUIPMENT FOR TESTING ELECTRICAL EQUIP AND
PCT OF TOTAL - 93.6

4★ SIC - 36113
NAME - OTHER ELECTRICAL MEASURING INSTRUMENTS
PCT OF TOTAL - 90.0

4★ SIC - 36422
NAME - COMMERCIAL AND INSTITUTIONAL TYPE ELECTRIC FIXT
PCT OF TOTAL - 100.0

4 SIC - 36421
NAME - COMMERCIAL INDUSTRIAL AND MILITARY ELECTRONIC C
PCT OF TOTAL - 92.8

GRADE B INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 80.0 AND 89.9 % OF THE TOTAL POSSIBLE SCORE)

SIC - 22561
NAME - WARP KNIT FABRICS
PCT OF TOTAL - 80.2

SIC - 25420
NAME - METAL PARTITIONS ETC AND OFFICE AND STORE FIXTU
PCT OF TOTAL - 83.2

SIC - 27612
NAME - MANIFOLD BUSINESS FORMS UNIT SET
PCT OF TOTAL - 88.3

SIC - 28213
NAME - THERMOPLASTIC RESINS
PCT OF TOTAL - 81.9

SIC - 28342
NAME - PHARMACEUTICAL PREPARATIONS ACTING ON CENTRAL N
PCT OF TOTAL - 89.1

SIC - 30784
NAME - CONSTRUCTION PLASTICS PRODUCTS
PCT OF TOTAL - 90.4

SIC - 32291
NAME - TABLE KITCHEN ART AND NOVELTY GLASSWARE
PCT OF TOTAL - 80.1

SIC - 33231
NAME - STEEL INVESTMENT CASTINGS ALL GRADES
PCT OF TOTAL - 83.9

INDUSTRY RANKING BY GRADE FOR THE CENTRAL UPPER PENINSULA
GROWTH COMMUNITY IS ESCANABA (ESCANABA-GLADSTONE) MICHIGAN

THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0
AND 100.0 % OF THE TOTAL POSSIBLE SCORE)

3
SIC - 22501
NAME - WAMP KNIT FABRICS
PCT OF TOTAL - 94.3

4
SIC - 33214
NAME - MISCELLANEOUS GRAY IRON CASTINGS
PCT OF TOTAL - 100.0

4
SIC - 33233
NAME - MISCELLANEOUS ALLOY STEEL CASTINGS
PCT OF TOTAL - 93.8

4
SIC - 34413
NAME - MISCELLANEOUS FABRICATED STRUCTURAL IRON AND ST
PCT OF TOTAL - 91.8

4
SIC - 35319
NAME - MISCELLANEOUS CONSTRUCTION MACHINERY
PCT OF TOTAL - 91.0

GRADE B INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 80.0
AND 89.9 % OF THE TOTAL POSSIBLE SCORE)

SIC - 24323
NAME - SOFTWOOD PLYWOOD
PCT OF TOTAL - 80.1

SIC - 24324
NAME - HARDWOOD PLYWOOD
PCT OF TOTAL - 89.9

SIC - 25221
NAME - METAL OFFICE SEATING ETC
PCT OF TOTAL - 88.0

SIC - 25420
NAME - METAL PARTITIONS ETC AND OFFICE AND STORE FIXTU
PCT OF TOTAL - 83.9

SIC - 26217
NAME - UNBLEACHED KRAFT PACKAGING
PCT OF TOTAL - 86.2

SIC - 27611
NAME - MANIFOLD BUSINESS FORMS CONTINUOUS
PCT OF TOTAL - 80.7

SIC - 27612
NAME - MANIFOLD BUSINESS FORMS UNIT SET
PCT OF TOTAL - 86.3

SIC - 28191
NAME - SYNTHETIC AMMONIA NITRIC ACID AND AMMONIUM COM
PCT OF TOTAL - 80.7

SIC - 28790
NAME - INSECTICIDAL AND FUNGICIDAL PREPARATIONS
PCT OF TOTAL - 84.4

SIC - 30792
NAME - FOAMED PLASTICS PRODUCTS
PCT OF TOTAL - 80.9

INDUSTRY RANKING BY GRADE FOR THE CENTRAL UPPER PENINSULA
GROWTH COMMUNITY IS GLADSTONE (ESCANABA-GLADSTONE) MICHIGAN
THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0
AND 100.0 % OF THE TOTAL POSSIBLE SCORE)

3 SIC - 22861
NAME - WARP KNIT FABRICS
PCT OF TOTAL - 94.3
3★ SIC - 28420
NAME - METAL PARTITIONS ETC AND OFFICE AND STORE FIXTU
PCT OF TOTAL - 92.9

2 SIC - 27611
NAME - MANIFOLD BUSINESS FORMS CONTINUOUS
PCT OF TOTAL - 100.0
3★ SIC - 30792
NAME - FOAMED PLASTICS PRODUCTS
PCT OF TOTAL - 90.4

3★ SIC - 30795
NAME - INDUSTRIAL PLASTICS PRODUCTS
PCT OF TOTAL - 100.0
4 SIC - 32291
NAME - TABLE KITCHEN ART AND NOVELTY GLASSWARE
PCT OF TOTAL - 94.3

4★ SIC - 33214
NAME - MISCELLANEOUS GRAY IRON CASTINGS
PCT OF TOTAL - 100.0
4★ SIC - 33232
NAME - MISCELLANEOUS CARBON STEEL CASTINGS
PCT OF TOTAL - 92.9

4★ SIC - 33233
NAME - MISCELLANEOUS ALLOY STEEL CASTINGS
PCT OF TOTAL - 93.8
4★ SIC - 33410
NAME - ALUMINUM AND ALUMINUM BASE ALLOY CASTINGS
PCT OF TOTAL - 91.3

4★ SIC - 34411
NAME - FABRICATED STRUCTURAL IRON AND STEEL FOR BUILDI
PCT OF TOTAL - 100.0
4★ SIC - 34413
NAME - MISCELLANEOUS FABRICATED STRUCTURAL IRON AND ST
PCT OF TOTAL - 100.0

4 SIC - 34431
NAME - HEAT EXCHANGERS AND STEAM CONDENSERS
PCT OF TOTAL - 90.3
4★ SIC - 34616
NAME - METAL COMMERCIAL AND HOME CANNING CLOSURES
PCT OF TOTAL - 100.0

4★ SIC - 34618
NAME - MISCELLANEOUS STAMPED AND PRESSED METAL END PRO
PCT OF TOTAL - 92.3
4 SIC - 34993
NAME - OTHER METAL VALVES FOR PIPING SYSTEMS AND EQUIP
PCT OF TOTAL - 91.1

GROWTH COMMUNITY IS GLADSTONE (ESCANABA-GLADSTONE) MICHIGAN

THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0 AND 100.0 % OF THE TOTAL POSSIBLE SCORE, CONT.)

4 SIC - 35223
NAME- PLANTING SEEDING AND FERTILIZING MACHINERY
PCT OF TOTAL- 100.0

4★ SIC - 35319
NAME- MISCELLANEOUS CONSTRUCTION MACHINERY
PCT OF TOTAL- 100.0

4★ SIC - 35351
NAME- CONVEYORS AND CONVEYING EQUIPMENT
PCT OF TOTAL- 92.9

3★ SIC - 35362
NAME- OVERHEAD TRAVELLING CRANES AND MONORAIL SYSTEMS
PCT OF TOTAL- 93.2

4★ SIC - 35451
NAME- SMALL CUTTING TOOLS FOR MACHINE TOOLS
PCT OF TOTAL- 100.0

4★ SIC - 35421
NAME- BALL BEARINGS (COMPLETE)
PCT OF TOTAL- 100.0

4 SIC - 35857
NAME- OTHER REFRIGERATION AND AIR CONDITIONING EQUIP
PCT OF TOTAL- 90.7

4★ SIC - 37321
NAME- INBOARD MOTOR BOATS
PCT OF TOTAL- 90.7

GRADE B INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 80.0 AND 89.9 % OF THE TOTAL POSSIBLE SCORE)

SIC - 24324
NAME- HUNWOOD FACE PLYWOOD
PCT OF TOTAL- 89.9

SIC - 25221
NAME- METAL OFFICE SEATING ETC
PCT OF TOTAL- 84.8

SIC - 26217
NAME- UNBLEACHED KRAFT PACKAGING
PCT OF TOTAL- 83.0

SIC - 27521
NAME- MAGAZINE AND PERIODICAL LITHOGRAPHIC PRINTING
PCT OF TOTAL- 83.3

SIC - 27612
NAME- MANIFOLD BUSINESS FORMS UNIT SET
PCT OF TOTAL- 85.1

SIC - 28191
NAME- SYNTHETIC AMMONIA NITRIC ACID AND AMMONIUM COMP
PCT OF TOTAL- 80.7

SIC - 28790
NAME- INSECTICIDAL AND FUNGICIDAL PREPARATIONS
PCT OF TOTAL- 86.6

SIC - 33220
NAME- MALLEABLE IRON CASTINGS
PCT OF TOTAL- 89.3

GRAND COMMUNITY IS IRONWOOD-IRON-OD-BESSEMER-MAKFIELD/NICH

THIS COMMUNITY WAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0 AND 100.0 OF THE TOTAL POSSIBLE SCORE)

3 SIC - 22561 NAME - WARP KNIT FABRICS PCT OF TOTAL - 94.3 3 SIC - 22562 NAME - CIRCULAR KNIT FABRICS PCT OF TOTAL - 100.0

4 SIC - 24323 NAME - SOFTWOOD PLYWOOD PCT OF TOTAL - 90.2 4 SIC - 26530 NAME - CORRUGATED AND SOLID FIBER BOXES PCT OF TOTAL - 94.0

4 SIC - 27521 NAME - MAGAZINE AND PERIODICAL LITHOGRAPHIC PRINTING 0 PCT OF TOTAL - 92.8 2 SIC - 27411 NAME - MANIFOLD BUSINESS FORMS CONTINUOUS PCT OF TOTAL - 100.0

3 SIC - 30792 NAME - FOAMED PLASTICS PRODUCTS PCT OF TOTAL - 100.0 3 SIC - 30795 NAME - INDUSTRIAL PLASTICS PRODUCTS PCT OF TOTAL - 100.0

4 SIC - 32210 NAME - GLASS CONTAINERS PCT OF TOTAL - 91.2 4 SIC - 32291 NAME - TABLE KITCHEN ART AND NOVELTY GLASSWARE PCT OF TOTAL - 94.3

4 SIC - 33214 NAME - MISCELLANEOUS GRAY IRON CASTINGS PCT OF TOTAL - 100.0 4 SIC - 33232 NAME - MISCELLANEOUS CARBON STEEL CASTINGS PCT OF TOTAL - 92.9

4 SIC - 33610 NAME - ALUMINUM AND ALUMINUM BASE ALLOY CASTINGS PCT OF TOTAL - 91.3 3 SIC - 34211 NAME - CUTLERY SCISSORS SHEARS TRIMMERS AND SNIPS PCT OF TOTAL - 100.0

3 SIC - 34231 NAME - MECHANICAL HAND SERVICE TOOLS PCT OF TOTAL - 92.0 4 SIC - 34431 NAME - HEAT EXCHANGERS AND STEAM CONDENSERS PCT OF TOTAL - 90.3

GROWTH COMMUNITY IS IRONWOOD(IRONWOOD-BESSEMER-WAKEFIELD/MICH

THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0 AND 100.0 % OF THE TOTAL POSSIBLE SCORE. CONT'D)

4★ SIC - 34610
 NAME- METAL COMMERCIAL AND HOME CANNING CLOSURES
 PCT OF TOTAL- 100.0

4 NAME- OTHER METAL VALVES FOR PIPING SYSTEMS AND EQUIP
 PCT OF TOTAL- 91.1

4 SIC - 35223
 NAME- PLANTING SEEDING AND FERTILIZING MACHINERY
 PCT OF TOTAL- 100.0

4★ SIC - 35319
 NAME- MISCELLANEOUS CONSTRUCTION MACHINERY
 PCT OF TOTAL- 100.0

3★ SIC - 35262
 NAME- OVERHEAD TRAVELING CRANES AND MONORAIL SYSTEMS
 PCT OF TOTAL- 93.2

4★ SIC - 35451
 NAME- SMALL CUTTING TOOLS FOR MACHINE TOOLS
 PCT OF TOTAL- 100.0

3★ SIC - 35401
 NAME- ROLLING MILL MACHINERY AND EQUIPMENT
 PCT OF TOTAL- 92.3

4★ SIC - 35421
 NAME- BALL BEARINGS(COMPLETE)
 PCT OF TOTAL- 100.0

4 SIC - 35853
 NAME- COMMERCIAL REFRIGERATION EQUIPMENT
 PCT OF TOTAL- 91.8

4 SIC - 35857
 NAME- OTHER REFRIGERATION AND AIR CONDITIONING EQUIP
 PCT OF TOTAL- 90.7

4★ SIC - 36113
 NAME- OTHER ELECTRICAL MEASURING INSTRUMENTS
 PCT OF TOTAL- 90.0

4★ SIC - 34211
 NAME- FRACTIONAL HORSEPOWER MOTORS
 PCT OF TOTAL- 100.0

4★ SIC - 37321
 NAME- INBOARD MOTOR BOATS
 PCT OF TOTAL- 96.0

2★ SIC - 37910
 NAME- TRAILER COACHES
 PCT OF TOTAL- 91.3

3★ SIC - 38711
 NAME- CLOCKS CLOCK MOVEMENTS AND TUNING MECHANISMS
 PCT OF TOTAL- 91.0

INDUSTRY RANKING BY GRADE FOR THE WESTERN UPPER PENINSULA
GROWTH COMMUNITY IS BESSEMER (IRONWOOD-BESSEMER - WAKEFIELD) MICH

THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0
AND 100.0 % OF THE TOTAL POSSIBLE SCORE)

3 SIC - 22561
NAME - WAMP KNIT FABRICS
PCT OF TOTAL - 94.3

3 SIC - 22642
NAME - CIRCULAR KNIT FABRICS
PCT OF TOTAL - 100.0

2 SIC - 27611
NAME - MANIFOLD BUSINESS FORMS CONTINUOUS
PCT OF TOTAL - 100.0

3 SIC - 30792
NAME - FOAMED PLASTICS PRODUCTS
PCT OF TOTAL - 100.0

4 SIC - 32291
NAME - TABLE KITCHEN ART AND NOVELTY GLASSWARE
PCT OF TOTAL - 94.3

4 SIC - 32214
NAME - MISCELLANEOUS GRAY IRON CASTINGS
PCT OF TOTAL - 100.0

4 SIC - 33232
NAME - MISCELLANEOUS CARBON STEEL CASTINGS
PCT OF TOTAL - 92.9

3 SIC - 34211
NAME - CUTLERY SCISSORS SHEARS TRIMMERS AND SNIPS
PCT OF TOTAL - 100.0

3 SIC - 34231
NAME - MECHANICS HAND SERVICE TOOLS
PCT OF TOTAL - 92.0

4 SIC - 35019
NAME - MISCELLANEOUS CONSTRUCTION MACHINERY
PCT OF TOTAL - 100.0

3 SIC - 35342
NAME - OVERHEAD TRAVELLING CRANES AND MONORAIL SYSTEMS
PCT OF TOTAL - 93.2

4 SIC - 35451
NAME - SMALL CUTTING TOOLS FOR MACHINE TOOLS
PCT OF TOTAL - 100.0

4 SIC - 35621
NAME - BALL BEARINGS (COMPLETE)
PCT OF TOTAL - 100.0

4 SIC - 35857
NAME - OTHER REFRIGERATION AND AIR CONDITIONING EQUIPM
PCT OF TOTAL - 90.7

4 SIC - 36113
NAME - OTHER ELECTRICAL MEASURING INSTRUMENTS
PCT OF TOTAL - 90.0

4 SIC - 36211
NAME - FRACTIONAL HORSEPOWER MOTORS
PCT OF TOTAL - 100.0

4 SIC - 37321
NAME - INBOARD MOTOR BOATS
PCT OF TOTAL - 90.3

INDUSTRY RANKING BY GRADE FOR THE WESTERN UPPER PENINSULA
GROWTH COMMUNITY IS WAKEFIELD/IRONWOOD-BESSNER-WAKEFIELD/NICK

KOD Page 1

THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0
AND 100.0 % OF THE TOTAL POSSIBLE SCORE)

3 SIC - 22561
NAME - WARP KNIT FABRICS
PCT OF TOTAL - 94.3

3 SIC - 22562
NAME - CIRCULAR KNIT FABRICS
PCT OF TOTAL - 100.0

4 SIC - 24323
NAME - SOFTWOOD PLYWOOD
PCT OF TOTAL - 90.2

4 SIC - 26530
NAME - CORRUGATED AND SOLID FIBER GILES
PCT OF TOTAL - 94.0

4 SIC - 27521
NAME - MAGAZINE AND PERIODICAL LITHOGRAPHIC PRINTING 0
PCT OF TOTAL - 96.9

2 SIC - 27611
NAME - MANIFOLD BUSINESS FORMS CONTINUOUS
PCT OF TOTAL - 100.0

3★ SIC - 30792
NAME - FOAMED PLASTICS PRODUCTS
PCT OF TOTAL - 100.0

3★ SIC - 30795
NAME - INDUSTRIAL PLASTICS PRODUCTS
PCT OF TOTAL - 100.0

4 SIC - 32210
NAME - GLASS CONTAINERS
PCT OF TOTAL - 91.2

4 SIC - 32281
NAME - TABLE KITCHEN ART AND NOVELTY GLASSWARE
PCT OF TOTAL - 94.3

4★ SIC - 33214
NAME - MISCELLANEOUS GRAY IRON CASTINGS
PCT OF TOTAL - 100.0

4★ SIC - 33232
NAME - MISCELLANEOUS CARBON STEEL CASTINGS
PCT OF TOTAL - 92.9

4★ SIC - 33610
NAME - ALUMINUM AND ALUMINUM BASE ALLOY CASTINGS
PCT OF TOTAL - 91.3

3★ SIC - 34211
NAME - CUTLERY SCISSORS SHEARS TRIMMERS AND SNIPS
PCT OF TOTAL - 100.0

4★ SIC - 34231
NAME - MECHANICS HAND SERVICE TOOLS
PCT OF TOTAL - 92.0

4 SIC - 34431
NAME - HEAT EXCHANGERS AND STEAM CONDENSERS
PCT OF TOTAL - 90.3

GROWTH COMMUNITY IS MAKEFIELD(IKONWOOD-BESSNER-MAKEFIELD/NICH THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0 AND 100.0 % OF THE TOTAL POSSIBLE SCORE, CONT.)

4★ SIC - 34614
NAME - METAL COMMERCIAL AND HOME CANNING CLOSURES
PCT OF TOTAL - 100.0

4 SIC - 34993
NAME - OTHER METAL VALVES FOR PIPING SYSTEMS AND EQUIP
PCT OF TOTAL - 91.1

4 SIC - 34945
NAME - METAL FITTINGS FLANGES AND UNIONS FOR PIPING SV
PCT OF TOTAL - 92.9

4 SIC - 35223
NAME - PLANTING SEEDING AND FERTILIZING MACHINERY
PCT OF TOTAL - 100.0

4★ SIC - 35315
NAME - MISCELLANEOUS CONSTRUCTION MACHINERY
PCT OF TOTAL - 100.0

3★ SIC - 35362
NAME - OVERHEAD TRAVELLING CRANES AND MONORAIL SYSTEMS
PCT OF TOTAL - 93.2

4★ SIC - 35451
NAME - SMALL CUTTING TOOLS FOR MACHINE TOOLS
PCT OF TOTAL - 100.0

3★ SIC - 35481
NAME - ROLLING MILL MACHINERY AND EQUIPMENT
PCT OF TOTAL - 92.3

3★ SIC - 35592
NAME - FOUNDRY MACHINERY AND EQUIPMENT
PCT OF TOTAL - 90.9

4★ SIC - 35621
NAME - BALL BEARINGS(COMPLETE)
PCT OF TOTAL - 100.0

4 SIC - 35853
NAME - COMMERCIAL REFRIGERATION EQUIPMENT
PCT OF TOTAL - 91.8

4 SIC - 35857
NAME - OTHER REFRIGERATION AND AIR CONDITIONING EQUIPM
PCT OF TOTAL - 90.7

4★ SIC - 36113
NAME - OTHER ELECTRICAL MEASURING INSTRUMENTS
PCT OF TOTAL - 90.0

4★ SIC - 36211
NAME - FRACTIONAL HORSEPOWER MOTORS
PCT OF TOTAL - 100.0

4 SIC - 36621
NAME - COMMERCIAL INDUSTRIAL AND MILITARY ELECTRONIC C
PCT OF TOTAL - 90.4

4★ SIC - 37321
NAME - INBOARD MOTOR BOATS
PCT OF TOTAL - 96.0

INDUSTRY RANKING BY GRADE FOR THE WESTERN UPPER PENINSULA
KNOWN COMMUNITY IS WARFIELD, IRONWOOD, BESSNER, WARFIELD/HIGH

THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0
AND 100.0 % OF THE TOTAL POSSIBLE SCORE, CONT.)

2★ SIC - 37910 TRAILER COACHES
NAME - TRAILER COACHES
PCT OF TOTAL - 91.3
3★ SIC - 38312 SIGHTING AND FIRE CONTROL EQUIPMENT MADE FROM L
NAME - SIGHTING AND FIRE CONTROL EQUIPMENT MADE FROM L
PCT OF TOTAL - 92.0

3★ SIC - 38711 CLOCKS CLOCK MOVEMENTS AND TIMING MECHANISMS
NAME - CLOCKS CLOCK MOVEMENTS AND TIMING MECHANISMS
PCT OF TOTAL - 96.0

GRADE B INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 80.0
AND 89.9 % OF THE TOTAL POSSIBLE SCORE)

SIC - 24324 NONWOOD FACE PLYWOOD
NAME - NONWOOD FACE PLYWOOD
PCT OF TOTAL - 89.8

SIC - 25221 METAL OFFICE SEATING ETC
NAME - METAL OFFICE SEATING ETC
PCT OF TOTAL - 80.8

SIC - 26217 UNBLEACHED KRAFT PACKAGING
NAME - UNBLEACHED KRAFT PACKAGING
PCT OF TOTAL - 83.7

SIC - 26931 PAPER GROCCERS AND VARIETY BAGS
NAME - PAPER GROCCERS AND VARIETY BAGS
PCT OF TOTAL - 86.7

SIC - 27321 BOOK AND PAMPHLET PRINTING LITHOGRAPHIC PROCESS
NAME - BOOK AND PAMPHLET PRINTING LITHOGRAPHIC PROCESS
PCT OF TOTAL - 83.8

SIC - 28191 SYNTHETIC AMMONIA NITRIC ACID AND AMMONIUM COMP
NAME - SYNTHETIC AMMONIA NITRIC ACID AND AMMONIUM COMP
PCT OF TOTAL - 80.7

SIC - 28790 FUNGICIDAL AND FUNGICIDAL PREPARATIONS
NAME - FUNGICIDAL AND FUNGICIDAL PREPARATIONS
PCT OF TOTAL - 83.9

SIC - 30794 PACKAGING AND SHIPPING CONTAINERS
NAME - PACKAGING AND SHIPPING CONTAINERS
PCT OF TOTAL - 85.8

SIC - 33220 MALLEABLE IRON CASTINGS
NAME - MALLEABLE IRON CASTINGS
PCT OF TOTAL - 88.3

SIC - 33231 STEEL INVESTMENT CASTINGS ALL GRADES
NAME - STEEL INVESTMENT CASTINGS ALL GRADES
PCT OF TOTAL - 80.2

SIC - 33525 EXTRUDED ALUMINUM ROD BAR AND OTHER EXTRUDED SH
NAME - EXTRUDED ALUMINUM ROD BAR AND OTHER EXTRUDED SH
PCT OF TOTAL - 89.1

SIC - 33574 COMMUNICATION WIRE AND CABLE
NAME - COMMUNICATION WIRE AND CABLE
PCT OF TOTAL - 89.1

INDUSTRY RANKING BY GRADE FOR THE NORTH WEST MICHIGAN
GROWTH COMMUNITY IS TRAVERSE CITY MICHIGAN

EOO PAGE 1

THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0
AND 100.0 % OF THE TOTAL POSSIBLE SCORE)

3
SIC - 22562
NAME - CIRCULAR KNIT FABRICS
PCT OF TOTAL - 91.0

3
SIC - 26932
NAME - SANITARY TISSUE HEALTH PRODUCTS
PCT OF TOTAL - 91.2

4
SIC - 28342
NAME - PHARMACEUTICAL PREPARATIONS ACTING ON CENTRAL N
PCT OF TOTAL - 93.6

4
SIC - 34432
NAME - FABRICATED STEEL PLATE
PCT OF TOTAL - 94.1

3
SIC - 35593
NAME - PLASTIC-MORKING MACH AND EQUIP AND PARTS
PCT OF TOTAL - 100.0

4
SIC - 35623
NAME - OTHER ROLLER BEARINGS COMPLETE
PCT OF TOTAL - 92.0

4
SIC - 36112
NAME - TEST EQUIPMENT FOR TESTING ELECTRICAL RADIO AND
PCT OF TOTAL - 93.6

4
SIC - 36113
NAME - OTHER ELECTRICAL MEASURING INSTRUMENTS
PCT OF TOTAL - 90.0

4
SIC - 36421
NAME - COMMERCIAL INDUSTRIAL AND MILITARY ELECTRONIC C
PCT OF TOTAL - 100.0

4
SIC - 36794
NAME - COILS TRANSFORMERS REACTORS AND CHOKES FOR ELEC
PCT OF TOTAL - 100.0

GRADE B INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 80.0
AND 89.9 % OF THE TOTAL POSSIBLE SCORE)

SIC - 22720
NAME - TUFTED CARPETS AND RUGS
PCT OF TOTAL - 80.7

SIC - 24324
NAME - NONWOOD FAGE PLYWOOD
PCT OF TOTAL - 81.0

SIC - 26213
NAME - COATED PRINTING AND CONVERTING PAPER
PCT OF TOTAL - 87.4

SIC - 26217
NAME - UNBLEACHED KRAFT PACKAGING
PCT OF TOTAL - 81.5

SIC - 26431
NAME - PAPER GROCERS AND VARIETY BAGS
PCT OF TOTAL - 82.4

SIC - 27321
NAME - BOOK AND PAMPHLET PRINTING LITHOGRAPHIC PROCESS
PCT OF TOTAL - 89.5

INDUSTRY RANKING BY GRADE FOR THE WESTERN UPPER PENINSULA
GROWTH COMMUNITY IS HOUGHTON MICHIGAN

EDD PAGE 1

THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0
AND 100.0 % OF THE TOTAL POSSIBLE SCORE)

3 SIC - 22561
NAME- WARP KNOT FABRICS
PCT OF TOTAL- 94.3

4★ SIC - 33214
NAME- MISCELLANEOUS GRAY IRON CASTINGS
PCT OF TOTAL- 100.0

4★ SIC - 35319
NAME- MISCELLANEOUS CONSTRUCTION MACHINERY
PCT OF TOTAL- 91.0

4★ SIC - 36113
NAME- OTHER ELECTRICAL MEASURING INSTRUMENTS
PCT OF TOTAL- 90.0

4★ SIC - 36211
NAME- FRACTIONAL HORSEPOWER MOTORS
PCT OF TOTAL- 100.0

4★ SIC - 37321
NAME- INBOARD MOTOR BOATS
PCT OF TOTAL- 94.4

GRADE B INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 80.0
AND 89.9 % OF THE TOTAL POSSIBLE SCORE)

SIC - 26217
NAME- UNBLEACHED KRAFT PACKAGING
PCT OF TOTAL- 81.4

SIC - 27611
NAME- MANIFOLD BUSINESS FORMS CONTINUOUS
PCT OF TOTAL- 80.7

SIC - 28182
NAME- MISCELLANEOUS ACYCLIC CHEMICALS AND CHEMICAL PR
PCT OF TOTAL- 81.5

SIC - 28213
NAME- THERMOPLASTIC RESINS
PCT OF TOTAL- 81.9

SIC - 30795
NAME- INDUSTRIAL PLASTICS PRODUCTS
PCT OF TOTAL- 80.2

SIC - 33232
NAME- MISCELLANEOUS CARBON STEEL CASTINGS
PCT OF TOTAL- 83.3

SIC - 33574
NAME- COMMUNICATION WIRE AND CABLE
PCT OF TOTAL- 82.3

SIC - 33610
NAME- ALUMINUM AND ALUMINUM BASE ALLOY CASTINGS
PCT OF TOTAL- 82.1

SIC - 34432
NAME- FABRICATED STEEL PLATE
PCT OF TOTAL- 86.7

SIC - 34616
NAME- METAL COMMERCIAL AND HOME CANNING CLOSURES
PCT OF TOTAL- 81.8

INDUSTRY RANKING BY GRADE FOR THE WESTERN UPPER PENINSULA

GROWTH COMMUNITY IS IRON RIVER MICHIGAN

THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0 AND 100.0 % OF THE TOTAL POSSIBLE SCORE)

2 SIC - 27411
NAME - MANIFOLD BUSINESS FORMS CONTINUOUS
PCT OF TOTAL - 90.7

3★ SIC - 30782
NAME - FOAMED PLASTICS PRODUCTS
PCT OF TOTAL - 90.1

3★ SIC - 30795
NAME - INDUSTRIAL PLASTICS PRODUCTS
PCT OF TOTAL - 100.0

4★ SIC - 33214
NAME - MISCELLANEOUS GRAY IRON CASTINGS
PCT OF TOTAL - 100.0

4★ SIC - 33610
NAME - ALUMINUM AND ALUMINUM BASE ALLOY CASTINGS
PCT OF TOTAL - 91.3

4★ SIC - 34616
NAME - METAL COMMERCIAL AND HOME CANNING CLOSURES
PCT OF TOTAL - 100.0

4 SIC - 35223
NAME - PLANTING SEEDING AND FERTILIZING MACHINERY
PCT OF TOTAL - 100.0

4★ SIC - 35951
NAME - SMALL CUTTING TOOLS FOR MACHINE TOOLS
PCT OF TOTAL - 100.0

4★ SIC - 35621
NAME - BALL BEARINGS (COMPLETE)
PCT OF TOTAL - 100.0

GRADE B INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 80.0 AND 89.9 % OF THE TOTAL POSSIBLE SCORE)

SIC - 22561
NAME - WARP KNIT FABRICS
PCT OF TOTAL - 83.5

SIC - 24324
NAME - HARDWOOD FLOOR PLYWOOD
PCT OF TOTAL - 82.2

SIC - 32291
NAME - TABLE KITCHEN ART AND NOVELTY GLASSWARE
PCT OF TOTAL - 80.1

SIC - 33220
NAME - MALLEABLE IRON CASTINGS
PCT OF TOTAL - 82.2

SIC - 34618
NAME - MISCELLANEOUS STAMPED AND PRESSED METAL END PRO
PCT OF TOTAL - 81.2

SIC - 35351
NAME - CONVEYORS AND CONVERTING EQUIPMENT
PCT OF TOTAL - 84.9

INDUSTRY RANKING BY GRADE FOR THE EASTERN UPPER PENINSULA
GROWTH COMMUNITY IS NEWBERRY MICHIGAN

ERD PAGE 1

THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0
AND 100.0 % OF THE TOTAL POSSIBLE SCORE),

3
SIC - 22541
NAME - WARP KNIT FABRICS
PCT OF TOTAL - 94.3

2
SIC - 27411
NAME - MANIFOLD BUSINESS FORMS CONTINUOUS
PCT OF TOTAL - 90.7

4★
SIC - 33214
NAME - MISCELLANEOUS GRAY IRON CASTINGS
PCT OF TOTAL - 100.0

4★
SIC - 33232
NAME - MISCELLANEOUS CARBON STEEL CASTINGS
PCT OF TOTAL - 92.9

4★
SIC - 35451
NAME - SMALL CUTTING TOOLS FOR MACHINE TOOLS
PCT OF TOTAL - 100.0

4★
SIC - 35421
NAME - BALL BEARINGS (COMPLETE)
PCT OF TOTAL - 100.0

GRADE B INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 80.0
AND 89.9 % OF THE TOTAL POSSIBLE SCORE)

SIC - 22562
NAME - CIRCULAR KNIT FABRICS
PCT OF TOTAL - 85.7

SIC - 27910
NAME - TYPESETTING AND TYPOGRAPHIC ROBE
PCT OF TOTAL - 85.9

SIC - 30795
NAME - INDUSTRIAL PLASTICS PRODUCTS
PCT OF TOTAL - 82.5

SIC - 33410
NAME - ALUMINUM AND ALUMINUM BASE ALLOY CASTINGS
PCT OF TOTAL - 82.7

SIC - 34231
NAME - MECHANICS HAND SERVICE TOOLS
PCT OF TOTAL - 80.0

SIC - 35223
NAME - PLANTING SEEDING AND FERTILIZING MACHINERY
PCT OF TOTAL - 87.5

SIC - 35362
NAME - OVERHEAD TRAVELING CRANES AND MONORAIL SYSTEMS
PCT OF TOTAL - 84.8

SIC - 35485
NAME - OTHER METALWORKING MACHINERY
PCT OF TOTAL - 80.2

SIC - 36211
NAME - FRACTIONAL HORSEPOWER MOTORS
PCT OF TOTAL - 86.2

SIC - 36793
NAME - RESISTORS FOR ELECTRONIC APPLICATIONS
PCT OF TOTAL - 82.9

INDUSTRY RANKING BY GRADE FOR THE EASTERN UPPER PENINSULA
GROWTH COMMUNITY IS STAGNACE MICHIGAN
THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0
AND 100.0 % OF THE TOTAL POSSIBLE SCORE)

3
SIC - 22562
NAME - CIRCULAR KNIT FABRICS
PCT OF TOTAL - 100.0

3
SIC - 34211
NAME - CUTLENY SCISSORS SHEARS TRIMMERS AND SNIPS
PCT OF TOTAL - 100.0

3
SIC - 34231
NAME - MECHANICS HAND SERVICE TOOLS
PCT OF TOTAL - 92.5

4
SIC - 35481
NAME - SMALL CUTTING TOOLS FOR MACHINE TOOLS
PCT OF TOTAL - 100.0

4
SIC - 35621
NAME - BALL BEARINGS (COMPLETE)
PCT OF TOTAL - 100.0

2
SIC - 37910
NAME - TRAILER COACHES
PCT OF TOTAL - 80.7

GRADE B INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 80.0
AND 89.9 % OF THE TOTAL POSSIBLE SCORE)

SIC - 22561
NAME - WARP KNIT FABRICS
PCT OF TOTAL - 80.2

SIC - 27321
NAME - BOOK AND PAMPHLET PRINTING LITHOGRAPHIC PROCESS
PCT OF TOTAL - 83.0

SIC - 27411
NAME - MANIFOLD BUSINESS FORMS CONTINUOUS
PCT OF TOTAL - 81.3

SIC - 32201
NAME - TABLE KITCHEN ART AND NOVELTY GLASSWARE
PCT OF TOTAL - 80.1

SIC - 33512
NAME - ROLLED DRAWN AND EXTRUDED COPPER AND COPPER BAS
PCT OF TOTAL - 83.1

SIC - 33574
NAME - COMMUNICATION WIRE AND CABLE
PCT OF TOTAL - 82.3

SIC - 33610
NAME - ALUMINUM AND ALUMINUM BASE ALLOY CASTINGS
PCT OF TOTAL - 82.7

SIC - 35370
NAME - INDUSTRIAL TRUCKS TRACTORS TRAILERS STACKERS AM
PCT OF TOTAL - 88.0

SIC - 35412
NAME - DRILLING MACHINES
PCT OF TOTAL - 83.6

SIC - 35483
NAME - OTHER ATTACHMENTS AND ACCESSORIES FOR MACHINE T
PCT OF TOTAL - 80.2

INDUSTRY RANKING BY GRADE FOR THE OCEANA COUNTY
GROWTH COMMUNITY IS HART MICHIGAN

THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.00 AND 100.00 OF THE TOTAL POSSIBLE SCORE)

3
SIC - 22561
NAME- WARP KNIT FABRICS
PCT OF TOTAL- 100.00

3
SIC - 22542
NAME- CIRCULAR KNIT FABRICS
PCT OF TOTAL- 91.00

4★
SIC - 33214
NAME- MISCELLANEOUS GRAY IRON CASTINGS
PCT OF TOTAL- 100.00

4★
SIC - 36211
NAME- PRACTICAL MOTORPOWER MOTORS
PCT OF TOTAL- 100.00

4★
SIC - 36794
NAME- COILS TRANSFORMERS REACTORS AND CHOKES FOR ELEC
PCT OF TOTAL- 100.00

GRADE B INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 80.00 AND 89.99 OF THE TOTAL POSSIBLE SCORE)

SIC - 27321
NAME- BOOK AND PAMPHLET PRINTING LITHOGRAPHIC PROCESS
PCT OF TOTAL- 88.05

SIC - 33232
NAME- MISCELLANEOUS CARBON STEEL CASTINGS
PCT OF TOTAL- 83.03

SIC - 33233
NAME- MISCELLANEOUS ALLOY STEEL CASTINGS
PCT OF TOTAL- 84.87

SIC - 34432
NAME- FABRICATED STEEL PLATE
PCT OF TOTAL- 86.82

SIC - 35451
NAME- SMALL CUTTING TOOLS FOR MACHINE TOOLS
PCT OF TOTAL- 85.09

SIC - 35791
NAME- CARBURIZERS PISTONS AND PISTON RINGS AND VALVES
PCT OF TOTAL- 80.7

SIC - 37321
NAME- INBOARD MOTOR BOATS
PCT OF TOTAL- 85.00

SIC - 38421
NAME- SURGICAL ORTHOPEDIC AND PROSTHETIC APPLIANCES A
PCT OF TOTAL- 80.66

INDUSTRY RANKING BY GRADE FOR THE WESTERN UPPER PENINSULA
GROWTH COMMUNITY IS ONTOWAGON (ONTOWAGON-WHITE PINE) MICHIGAN
THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0
AND 100.0 % OF THE TOTAL POSSIBLE SCORE)

2
SIC - 27611
NAME- MANIFOLD BUSINESS FORMS CONTINUOUS
PCT OF TOTAL- 90.7
4★
SIC - 33214
NAME- MISCELLANEOUS GRAY IRON CASTINGS
PCT OF TOTAL- 100.0

4★
SIC - 35451
NAME- SMALL CUTTING TOOLS FOR MACHINE TOOLS
PCT OF TOTAL- 100.0
4★
SIC - 35621
NAME- BALL BEARINGS (COMPLETE)
PCT OF TOTAL- 100.0

GRADE B INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 80.0
AND 89.9 % OF THE TOTAL POSSIBLE SCORE)

SIC - 22561
NAME- WARP KNIT FABRICS
PCT OF TOTAL- 82.5
SIC - 30795
NAME- INDUSTRIAL PLASTICS PRODUCTS
PCT OF TOTAL- 82.8

SIC - 33610
NAME- ALUMINUM AND ALUMINUM BASE ALLOY CASTINGS
PCT OF TOTAL- 82.7
SIC - 35223
NAME- PLANTING SEEDING AND FERTILIZING MACHINERY
PCT OF TOTAL- 87.5

SIC - 35319
NAME- MISCELLANEOUS CONSTRUCTION MACHINERY
PCT OF TOTAL- 81.4
SIC - 35657
NAME- OTHER REFRIGERATION AND AIR CONDITIONING EQUIPM
PCT OF TOTAL- 81.2

SIC - 36211
NAME- FRACTIONAL HORSEPOWER MOTORS
PCT OF TOTAL- 86.2
SIC - 38421
NAME- SURGICAL ORTHOPEDIC AND PROSTHETIC APPLIANCES A
PCT OF TOTAL- 80.6

GRADE C INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 70.0
AND 79.9 % OF THE TOTAL POSSIBLE SCORE)

SIC - 32562
NAME- CIRCULAR KNIT FABRICS
PCT OF TOTAL- 70.3
SIC - 24324
NAME- NONWOOD FACE PLYWOOD
PCT OF TOTAL- 71.0

GROWTH COMMUNITY IS WHITE PINE (DUNOMAGON-WHITE PINE) MICHIGAN

THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0 AND 100.0 & OF THE TOTAL POSSIBLE SCORE)

2 SIC - 27611
NAME - MANIFOLD BUSINESS FORMS CONTINUOUS
PCT OF TOTAL - 100.0

3★ SIC - 30782
NAME - FOAMED PLASTICS PRODUCTS
PCT OF TOTAL - 70.9

4★ SIC - 33214
NAME - MISCELLANEOUS GRAY IRON CASTINGS
PCT OF TOTAL - 100.0

4★ SIC - 33233
NAME - MISCELLANEOUS ALLOY STEEL CASTINGS
PCT OF TOTAL - 93.8

4★ SIC - 34411
NAME - FABRICATED STRUCTURAL IRON AND STEEL FOR BUILDI
PCT OF TOTAL - 100.0

4★ SIC - 34413
NAME - MISCELLANEOUS FABRICATED STRUCTURAL IRON AND ST
PCT OF TOTAL - 100.0

4★ SIC - 35319
NAME - MISCELLANEOUS CONSTRUCTION MACHINERY
PCT OF TOTAL - 100.0

4★ SIC - 35451
NAME - SMALL CUTTING TOOLS FOR MACHINE TOOLS
PCT OF TOTAL - 100.0

4★ SIC - 35621
NAME - BALL BEARINGS (COMPLETE)
PCT OF TOTAL - 100.0

4 SIC - 35857
NAME - OTHER REFRIGERATION AND AIR CONDITIONING EQUIPM
PCT OF TOTAL - 70.7

GRADE B INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 80.0 AND 89.9 & OF THE TOTAL POSSIBLE SCORE)

SIC - 22661
NAME - WARP KNIT FABRICS
PCT OF TOTAL - 83.5

SIC - 24324
NAME - NORWOOD FACE PLYWOOD
PCT OF TOTAL - 89.7

SIC - 25221
NAME - METAL OFFICE SEATING ETC
PCT OF TOTAL - 81.0

SIC - 28191
NAME - SYNTHETIC AMMONIA NITRIC ACID AND AMMONIUM COMP
PCT OF TOTAL - 80.7

SIC - 30795
NAME - INDUSTRIAL PLASTICS PRODUCTS
PCT OF TOTAL - 82.5

SIC - 32291
NAME - TABLE KITCHEN ART AND NOVELTY GLASSWARE
PCT OF TOTAL - 85.9

GROWTH COMMUNITY IS SAGINAW ESAGINAW-GAY CITY-MIDLANDS

THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0 AND 100.0 % OF THE TOTAL POSSIBLE SCORE)

4 SIC - 26530 NAME - CORRUGATED AND SOLID FIBER BOXES PCT OF TOTAL - 94.0 4 SIC - 27521 NAME - MAGAZINE AND PERIODICAL LITHOGRAPHIC PRINTING PCT OF TOTAL - 91.1

4 SIC - 28342 NAME - PHARMACEUTICAL PREPARATIONS ACTING ON CENTRAL N PCT OF TOTAL - 93.6 4 SIC - 33574 NAME - COMMUNICATION WIRE AND CABLE PCT OF TOTAL - 94.2

3 SIC - 34211 NAME - CUTLERY SCISSORS SHEARS TRIMMERS AND SNIPS PCT OF TOTAL - 100.0 4 SIC - 34432 NAME - FABRICATED STEEL PLATE PCT OF TOTAL - 100.0

4 SIC - 34943 NAME - OTHER METAL VALVES FOR PIPING SYSTEMS AND EQUIP PCT OF TOTAL - 100.0 3 SIC - 35422 NAME - PRESSES INCLUDING FORGING PRESSES PCT OF TOTAL - 90.1

3 SIC - 35593 NAME - PLASTIC-WORKING MACH AND EQUIP AND PARTS PCT OF TOTAL - 100.0 4 SIC - 35821 NAME - BALL BEARINGS(COMPLETE) PCT OF TOTAL - 100.0

4 SIC - 35857 NAME - OTHER REFRIGERATION AND AIR CONDITIONING EQUIPM PCT OF TOTAL - 90.7 4 SIC - 36112 NAME - TEST EQUIPMENT FOR TESTING ELECTRICAL RADIO AND PCT OF TOTAL - 93.6

4 SIC - 36113 NAME - OTHER ELECTRICAL MEASURING INSTRUMENTS PCT OF TOTAL - 100.0 4 SIC - 36621 NAME - COMMERCIAL INDUSTRIAL AND MILITARY ELECTRONIC C PCT OF TOTAL - 93.9

4 SIC - 36794 NAME - COILS TRANSFORMERS REACTORS AND CHOKES FOR ELEC PCT OF TOTAL - 100.0 3 SIC - 38711 NAME - CLOCKS CLOCK MOVEMENTS AND TIMING MECHANISMS PCT OF TOTAL - 95.0

INDUSTRY RANKING BY GRADE FOR THE EAST CENTRAL MICHIGAN
GROWTH COMMUNITY IS BAY CITY ESCANAWA-BAY CITY-MIDLANDS

THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0
AND 100.0 % OF THE TOTAL POSSIBLE SCORE)

4 SIC - 26530
NAME - CORRUGATED AND SOLID FIBER BOXES
PCT OF TOTAL - 94.0

3 SIC - 27910
NAME - TYPESETTING AND TYPOGRAPHIC WORK
PCT OF TOTAL - 100.0

3★ SIC - 34211
NAME - CUTLERY SCISSORS SHEARS TRIMMERS AND SNIPS
PCT OF TOTAL - 100.0

4 SIC - 34432
NAME - FABRICATED STEEL PLATE
PCT OF TOTAL - 100.0

4 SIC - 34443
NAME - OTHER METAL VALVES FOR PIPING SYSTEMS AND EQUIP
PCT OF TOTAL - 100.0

3★ SIC - 35593
NAME - PLASTIC-WORKING MACH AND EQUIP AND PARTS
PCT OF TOTAL - 100.0

4★ SIC - 35621
NAME - BALL BEARINGS (COMPLETE)
PCT OF TOTAL - 100.0

4 SIC - 35857
NAME - OTHER REFRIGERATION AND AIR CONDITIONING EQUIP
PCT OF TOTAL - 90.7

4★ SIC - 36112
NAME - TEST EQUIPMENT FOR TESTING ELECTRICAL RADIO AND
PCT OF TOTAL - 93.6

4★ SIC - 36113
NAME - OTHER ELECTRICAL MEASURING INSTRUMENTS
PCT OF TOTAL - 100.0

4★ SIC - 36794
NAME - COILS TRANSFORMERS REACTORS AND CHOKES FOR ELEC
PCT OF TOTAL - 100.0

2★ SIC - 38513
NAME - MISCELLANEOUS OPHTHALMIC GOODS
PCT OF TOTAL - 93.3

GRADE B INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 80.0
AND 89.9 % OF THE TOTAL POSSIBLE SCORE)

4 SIC - 22562
NAME - CIRCULAR KNIT FABRICS
PCT OF TOTAL - 99.8

SIC - 25223
NAME - METAL OFFICE CABINETS AND CASES
PCT OF TOTAL - 80.8

SIC - 26931
NAME - PAPER BAGGERS AND VARIETY BAGS
PCT OF TOTAL - 82.9

SIC - 27321
NAME - BOOK AND PAMPHLET PRINTING LITHOGRAPHIC PROCESS
PCT OF TOTAL - 89.8

INDUSTRY RANKING BY GRADE FOR THE EAST CENTRAL MICHIGAN
GROTH COMMUNITY IS MIDLAND (SAGINAW-BAY CITY-MIDLAND)
THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0
AND 100.0 % OF THE TOTAL POSSIBLE SCORE)

4 SIC - 34432
NAME- FABRICATED STEEL PLATE
PCT OF TOTAL- 100.0

3* SIC - 35593
NAME- PLASTIC-WORKING MACH AND EQUIP AND PARTS
PCT OF TOTAL- 100.0

4* SIC - 36112
NAME- TEST EQUIPMENT FOR TESTING ELECTRICAL RADIO AND
PCT OF TOTAL- 93.9

4* SIC - 36113
NAME- OTHER ELECTRICAL MEASURING INSTRUMENTS
PCT OF TOTAL- 100.0

4* SIC - 36621
NAME- COMMERCIAL INDUSTRIAL AND MILITARY ELECTRONIC C
PCT OF TOTAL- 93.9

4* SIC - 36784
NAME- COILS TRANSFORMERS REACTORS AND CHOKES FOR ELEC
PCT OF TOTAL- 100.0

GRADE B INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 80.0
AND 89.9 % OF THE TOTAL POSSIBLE SCORE)

SIC - 22562
NAME- CIRCULAR KNIT FABRICS
PCT OF TOTAL- 80.9

SIC - 26931
NAME- PAPER GROCERS AND VARIETY BASK
PCT OF TOTAL- 82.9

SIC - 27521
NAME- MAGAZINE AND PERIODICAL LITHOGRAPHIC PRINTING O
PCT OF TOTAL- 81.2

SIC - 27523
NAME- LABEL EXCLUDING CLOTH AND WRAPPER PRINTING
PCT OF TOTAL- 80.0

SIC - 27910
NAME- TYPESETTING AND TYPOGRAPHIC WORK
PCT OF TOTAL- 86.3

SIC - 28392
NAME- PHARMACEUTICAL PREPARATIONS ACTING ON CENTRAL N
PCT OF TOTAL- 69.0

SIC - 28445
NAME- MISCELLANEOUS COSMETICS AND TOILET PREPARATIONS
PCT OF TOTAL- 82.1

SIC - 33231
NAME- STEEL INVESTMENT CASTINGS ALL GRADES
PCT OF TOTAL- 82.1

SIC - 34460
NAME- ARCHITECTURAL AND ORNAMENTAL METAL WORK
PCT OF TOTAL- 61.7

SIC - 34616
NAME- METAL COMMERCIAL AND HOME CANNING CLOSURES
PCT OF TOTAL- 89.0

INDUSTRY RANKING BY GRADE FOR THE CENTRAL UPPER PENINSULA OF MICHIGAN EDD PAGE 1
GROWTH COMMUNITY IS MARQUETTE (MARQUETTE-MEGAUNEE-ISHPEMING)

THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0
AND 100.0 % OF THE TOTAL POSSIBLE SCORE)

4★ SIC - 33214
NAME- MISCELLANEOUS GRAY IRON CASTINGS
PCT OF TOTAL- 100.0

4★ SIC - 33233
NAME- MISCELLANEOUS ALLOY STEEL CASTINGS
PCT OF TOTAL- 93.8

4★ SIC - 34413
NAME- MISCELLANEOUS FABRICATED STRUCTURAL IRON AND ST
PCT OF TOTAL- 91.8

4★ SIC - 35319
NAME- MISCELLANEOUS CONSTRUCTION MACHINERY
PCT OF TOTAL- 91.0

GRADE B INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 80.0
AND 89.9 % OF THE TOTAL POSSIBLE SCORE)

SIC - 27230
NAME- TUFTED CARPETS AND RUGS
PCT OF TOTAL- 82.8

SIC - 24324
NAME- NONWOOD FACE PLYWOOD
PCT OF TOTAL- 81.0

SIC - 25221
NAME- METAL OFFICE SEATING ETC
PCT OF TOTAL- 84.2

SIC - 25420
NAME- METAL PARTITIONS ETC AND OFFICE AND STORE FIXTU
PCT OF TOTAL- 83.9

SIC - 26213
NAME- COATED PRINTING AND CONVERTING PAPER
PCT OF TOTAL- 83.9

SIC - 26217
NAME- UNBLEACHED KRAFT PACKAGING
PCT OF TOTAL- 82.2

SIC - 27611
NAME- MANIFOLD BUSINESS FORMS CONTINUOUS
PCT OF TOTAL- 80.7

SIC - 27612
NAME- MANIFOLD BUSINESS FORMS UNIT SET
PCT OF TOTAL- 88.3

SIC - 28790
NAME- INSECTICIDAL AND FUNGICIDAL PREPARATIONS
PCT OF TOTAL- 84.4

SIC - 30792
NAME- FOAMED PLASTICS PRODUCTS
PCT OF TOTAL- 80.9

SIC - 33220
NAME- MALLEABLE IRON CASTINGS
PCT OF TOTAL- 86.3

SIC - 33232
NAME- MISCELLANEOUS CARBON STEEL CASTINGS
PCT OF TOTAL- 83.3

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0 AND 100.0 % OF THE TOTAL POSSIBLE SCORE)

3★ SIC - 25420
NAME- METAL PARTITIONS ETC AND OFFICE AND STORE FIXTU
PCT OF TOTAL- 92.4

2 SIC - 27211
NAME- MANIFOLD BUSINESS FORMS CONTINUOUS
PCT OF TOTAL- 100.0

3★ SIC - 30792
NAME- FOAMED PLASTICS PRODUCTS
PCT OF TOTAL- 90.4

4 SIC - 32210
NAME- GLASS CONTAINERS
PCT OF TOTAL- 93.4

4★ SIC - 33214
NAME- MISCELLANEOUS GRAY IRON CASTINGS
PCT OF TOTAL- 100.0

4★ SIC - 33232
NAME- MISCELLANEOUS CARBON STEEL CASTINGS
PCT OF TOTAL- 92.9

4★ SIC - 33233
NAME- MISCELLANEOUS ALLOY STEEL CASTINGS
PCT OF TOTAL- 93.0

4★ SIC - 34411
NAME- FABRICATED STRUCTURAL IRON AND STEEL FOR BUILDI
PCT OF TOTAL- 100.0

4★ SIC - 34913
NAME- MISCELLANEOUS FABRICATED STRUCTURAL IRON AND ST
PCT OF TOTAL- 100.0

4 SIC - 34945
NAME- METAL FITTINGS FLANGES AND UNIONS FOR PIPING SY
PCT OF TOTAL- 92.9

4★ SIC - 35319
NAME- MISCELLANEOUS CONSTRUCTION MACHINERY
PCT OF TOTAL- 100.0

3★ SIC - 35362
NAME- OVERHEAD TRAVELLING CRANES AND MONORAIL SYSTEMS
PCT OF TOTAL- 93.2

4★ SIC - 35451
NAME- SMALL CUTTING TOOLS FOR MACHINE TOOLS
PCT OF TOTAL- 100.0

4★ SIC - 35621
NAME- BALL BEARINGS(COMPLETE)
PCT OF TOTAL- 100.0

4 SIC - 35857
NAME- OTHER REFRIGERATION AND AIR CONDITIONING EQUIPM
PCT OF TOTAL- 90.7

3★ SIC - 38312
NAME- SIGHTING AND FIRE CONTROL EQUIPMENT MADE FROM L
PCT OF TOTAL- 92.0

3★ SIC - 38711
NAME- CLOCKS CLOCK MOVEMENTS AND TIMING MECHANISMS
PCT OF TOTAL- 91.0

INDUSTRY RANKING BY GRADE FOR THE CENTRAL MICHIGAN

GROTH COMMUNITY IS ISMPENING (MARQUETTE-NEGATIVE-ISMPENING)
THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0
AND 100.0 % OF THE TOTAL POSSIBLE SCORE)

3 SIC - 25221
NAME- METAL OFFICE SEATING ETC
PCT OF TOTAL- 91.8
3★ SIC - 25420
NAME- MEVAL PARTITIONS ETC AND OFFICE AND STORE FIXTU
PCT OF TOTAL- 92.9

2 SIC - 26213
NAME- COATED PRINTING AND CONVERTING PAPER
PCT OF TOTAL- 93.5
2 NAME- UNBLEACHED KRAFT PACKAGING
PCT OF TOTAL- 91.1

2 SIC - 27611
NAME- MANIFOLD BUSINESS FORMS CONTINUOUS
PCT OF TOTAL- 100.0
4 SIC - 28182
NAME- MISCELLANEOUS ACYCLIC CHEMICALS AND CHEMICAL PR
PCT OF TOTAL- 100.0

3 SIC - 28790
NAME- INSECTICIDAL AND FUNGICIDAL PREPARATIONS
PCT OF TOTAL- 91.9
3★ SIC - 30782
NAME- FOAMED PLASTICS PRODUCTS
PCT OF TOTAL- 90.4

4★ SIC - 33214
NAME- MISCELLANEOUS GRAY IRON CASTINGS
PCT OF TOTAL- 100.0
4★ SIC - 33230
NAME- MALLEABLE IRON CASTINGS
PCT OF TOTAL- 94.4

4★ SIC - 33232
NAME- MISCELLANEOUS CARBON STEEL CASTINGS
PCT OF TOTAL- 100.0
4★ SIC - 33283
NAME- MISCELLANEOUS ALLOY STEEL CASTINGS
PCT OF TOTAL- 93.8

4★ SIC - 34411
NAME- FABRICATED STRUCTURAL IRON AND STEEL FOR BUILDI
PCT OF TOTAL- 100.0
4★ SIC - 34413
NAME- MISCELLANEOUS FABRICATED STRUCTURAL IRON AND ST
PCT OF TOTAL- 100.0

4 SIC - 34945
NAME- METAL FITTINGS FLANGES AND UNIONS FOR PIPING SY
PCT OF TOTAL- 92.9
4★ SIC - 35319
NAME- MISCELLANEOUS CONSTRUCTION MACHINERY
PCT OF TOTAL- 100.0

GROWTH COMMUNITY IS IRON MOUNTAIN (IRON MT.-KINGSFORD-NORWAY)
THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0 AND 100.0 % OF THE TOTAL POSSIBLE SCORE)

3 SIC - 22561
NAME - WARP KNIT FABRICS
PCT OF TOTAL - 100.0

4* SIC - 33214
NAME - MISCELLANEOUS GRAY IRON CASTINGS
PCT OF TOTAL - 100.0

4* SIC - 33232
NAME - MISCELLANEOUS CARBON STEEL CASTINGS
PCT OF TOTAL - 90.4

4* SIC - 34616
NAME - METAL COMMERCIAL AND HOME CANNING CLOSURES
PCT OF TOTAL - 100.0

3* SIC - 35672
NAME - FUEL FIRED INDUSTRIAL FURNACES AND OVENS
PCT OF TOTAL - 90.8

4* SIC - 36784
NAME - COILS TRANSFORMERS REACTORS AND CHOKES FOR ELEC
PCT OF TOTAL - 100.0

GRADE B INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 80.0 AND 89.9 % OF THE TOTAL POSSIBLE SCORE)

SIC - 24323
NAME - SOFTWOOD PLYWOOD
PCT OF TOTAL - 83.3

SIC - 24384
NAME - NORWOOD FARE PLYWOOD
PCT OF TOTAL - 82.8

SIC - 24326
NAME - SOFTWOOD VENEER
PCT OF TOTAL - 85.1

SIC - 27521
NAME - MAGAZINE AND PERIODICAL LITHOGRAPHIC PRINTING
PCT OF TOTAL - 82.5

SIC - 27611
NAME - MANIFOLD BUSINESS FORMS CONTINUOUS
PCT OF TOTAL - 80.7

SIC - 27612
NAME - MANIFOLD BUSINESS FORMS UNIT SET
PCT OF TOTAL - 83.9

SIC - 27910
NAME - TYPESETTING AND TYPOGRAPHIC WORK
PCT OF TOTAL - 85.4

SIC - 30782
NAME - FOAMED PLASTICS PRODUCTS
PCT OF TOTAL - 80.9

SIC - 30795
NAME - INDUSTRIAL PLASTICS PRODUCTS
PCT OF TOTAL - 80.2

SIC - 32210
NAME - GLASS CONTAINERS
PCT OF TOTAL - 84.5

INDUSTRY RANKING BY GRADE FOR THE CENTRAL MICHIGAN

GROWTH COMMUNITY IS ISHPEMING (MARQUETTE-NEGAMET-ISHPEMING)

THIS COMMUNITY HAS SATISFIED ALL CRITICAL REQUIREMENTS FOR INDUSTRIES LISTED BELOW

GRADE A INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 90.0 AND 100.0 % OF THE TOTAL POSSIBLE SCORE, CONT'D)

3★ SIC - 35362
NAME- OVERHEAD TRAVELLING CRANES AND MONORAIL SYSTEMS
PCT OF TOTAL- 93.2

4★ SIC - 35451
NAME- SMALL CUTTING TOOLS FOR MACHINE TOOLS
PCT OF TOTAL- 100.0

3★ SIC - 35482
NAME- POWER DRIVEN HAND TOOLS
PCT OF TOTAL- 90.7

4★ SIC - 35621
NAME- BALL BEARINGS (COMPLETE)
PCT OF TOTAL- 100.0

4 SIC - 35857
NAME- OTHER REFRIGERATION AND AIR CONDITIONING EQUIP
PCT OF TOTAL- 90.7

2★ SIC - 37981
NAME- AUTOMOBILE TRAILERS
PCT OF TOTAL- 75.6

3★ SIC - 38312
NAME- SIGHTING AND FIRE CONTROL EQUIPMENT MADE FROM L
PCT OF TOTAL- 92.0

GRADE B INDUSTRIES (INDUSTRIES FOR WHICH THIS COMMUNITY SCORED BETWEEN 80.0 AND 89.9 % OF THE TOTAL POSSIBLE SCORE)

SIC - 22562
NAME- CIRCULAR KNIT FABRICS
PCT OF TOTAL- 85.7

SIC - 22780
NAME- TUFTED CARPETS AND RUGS
PCT OF TOTAL- 98.1

SIC - 24323
NAME- SOFTWOOD PLYWOOD
PCT OF TOTAL- 80.4

SIC - 24324
NAME- NONWOOD FIBER PLYWOOD
PCT OF TOTAL- 81.0

SIC - 26431
NAME- PAPER GROCERS AND VARIETY BAGS
PCT OF TOTAL- 82.2

SIC - 26492
NAME- SANITARY TISSUE HEALTH PRODUCTS
PCT OF TOTAL- 89.0

SIC - 27521
NAME- MAGAZINE AND PERIODICAL LITHOGRAPHIC PRINTING
PCT OF TOTAL- 87.8

SIC - 27524
NAME- FINANCIAL AND LEGAL PRINTING LITHOGRAPHIC
PCT OF TOTAL- 85.4