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Introduction

Pharmacia employed more than 5,800 persons in Kalamazoo County during 2000, making it the largest employer in the county.¹ In fact, the pharmaceutical company's employment size is 70 percent larger than Western Michigan University, the county's second largest employer. Pharmacia accounted for 4.7 percent of the county's total estimated workforce of 124,700 in 2000.² Moreover, the company's county payroll reached nearly \$373 million in 2000 and represented approximately 8.8 percent of the county's estimated total wage and salary disbursement.

**Table 1
Five Largest Employers in Kalamazoo County**

Employer	Employees
Pharmacia	5,851
Western Michigan University	3,458
National City Bank	2,800
Bronson Healthcare	2,561
Borgess Healthcare	2,503

Source: Pharmacia, Western Michigan University, and Southwest Michigan First.

Total Economic Impact of Pharmacia on Kalamazoo County

Of course, the total economic impact of Pharmacia on Kalamazoo County is much greater than simply the size of its labor force and payroll. Pharmacia, through the sales of its products, brings millions of dollars into the county which are then re-circulated in the county's economy. The company's full economic impact on the county includes, in addition to its direct employment and payroll levels, the employment and payroll generated by the following:

- The company's suppliers that are located within the county's boundaries.
- The county's retailers and consumer services providers who depend upon the expenditures of Pharmacia's employees.
- The companies that supply and provide services to Pharmacia's county suppliers and the impacted retailers and consumer services providers located in the county.
- The county governmental units which depend upon the total level of economic activity generated by the company within the county.

As shown in Table 2, we estimate that Pharmacia supported 8,954 workers in the county in 2000, in addition to its own workforce of 5,851. In other words, a total of 14,805 individuals, directly or indirectly, depended

¹This does not include the approximate 1,200 temporary employment agency workers who work at Pharmacia.

²W.E. Upjohn Institutes's county employment estimate.

upon Pharmacia for their economic livelihood in Kalamazoo County during 2000. In percentage terms the company supported, directly or indirectly, nearly 12 percent of the county's total workforce. Table 2 provides an industrial breakdown of Pharmacia's employment on Kalamazoo County in 2000.

In terms of household income, Pharmacia's direct payroll of \$372.9 million generated an additional \$324.7 million in wages, salaries, and proprietor's income in Kalamazoo County in 2000. In all, an estimated \$697.6 million in wages, salaries, and proprietor's income was generated in Kalamazoo County in 2000 due solely to the presence of Pharmacia.

Table 2
Total Economic Impact of Pharmacia on Kalamazoo County
2000

	Employment	Wages, Salaries and Proprietor's income (\$million)
Pharmacia	5,851	\$372.9
Total Indirect	8,954	\$324.7
Manufacturing	198	
Construction	961	
Finance, Insurance & Real Estate	603	
Retail	2,158	
Wholesale	260	
Services	4,283	
Other	309	
Government	182	
Total Impact	14,805	\$697.6

Source: Pharmacia and the W.E. Upjohn Institute

In regional impact studies, an employment multiplier is often used as a standard indicator of a firm's impact on its community. The multiplier is calculated by dividing the firm's total impact by its direct impact. In this instance, Pharmacia's employment multiplier is 2.5 which means that every employee at Pharmacia generates, on average, 1.5 additional jobs in Kalamazoo County. The company generates a compensation multiplier of 1.87 suggesting that every dollar in wages and salaries paid at the company created another \$0.87 in wages and salaries in the county.

Pharmacia's corporate donations were not included in this impact analysis, yet they have a very positive impact on the area's quality of life. In 2000, Pharmacia donated \$3.8 million for community activities, which was down slightly from the \$4 million it contributed to the county in 1999.

Finally, the total economic impact of Pharmacia may best be represented by its contribution to the county's Gross Regional Product (GRP), which is a measure of the value of all goods and services generated in the county. The county's GRP is its counterpart to the nation's GDP. In 2000, Pharmacia contributed an estimated \$1.03 billion to the county's GRP.

Comparison with the Economic Impact of Western Michigan University

In February, 2001, Professor Harik of WMU's Department of Economics, with the assistance of the W.E. Upjohn Institute, prepared *The Economic Impact of Western Michigan University on Kalamazoo County* for 1999-2000 academic year. In Table 3, we compare the economic impact of Pharmacia and WMU. Clearly, Pharmacia

has a greater economic impact on the county due to its size and the magnitude of its employment multiplier. In addition to employing 70 percent more workers than WMU, Pharmacia also paid 2.5 times more than the university in wages and salaries. Pharmacia's employment multiplier is higher than the university's, which is somewhat surprising given that WMU's multiplier includes the impact of its students' expenditures. On average, 100 employees at Pharmacia support an additional 150 workers in the county, while 100 workers at WMU support only 110. However, WMU does have a higher wage and salary multiplier. Student expenditures are included in the WMU impact analysis. Students spend most of their money on very labor intensive services e.g eating and drinking places and hair salons, where a larger portion of the cost of the service is paid out in wages. Hence, it is not surprising that the university's wage and salary multiplier is larger.

Table 3
Comparison of Pharmacia and Western Michigan University

	Pharmacia	WMU	Difference
Direct employment	5,851	3,458	2,393
Indirect employment	8,954	3,756	5,198
Total employment	14,805	7,214	7,591
Employment multiplier	2.5	2.1	
Direct wages and salary (\$millions)	\$372.9	\$139.9	\$233.0
Total wages, salaries, proprietors proprietor's income - (\$millions)	\$697.6	\$288.0	\$409.6
Wage and salary multiplier	1.87	2.06	

Source: W.E. Upjohn Institute and WMU.

Methodology

The W.E. Upjohn Institute maintains a computer model especially designed to estimate the full economic impact of changes in business activity within the county. The model was built for the Institute by Regional Economic Models Incorporated (REMI) of Amherst, Mass. The model is, in fact, three interconnected models:

- An input-output model that estimates the industrial linkages among the county's businesses and measures the impact of consumer expenditures on the county's retailers and consumer service providers.
- A relative cost model that estimates the impact on the county's wages and prices of employment changes in the county.
- A forecasting model.

The impact of Pharmacia is measured by the difference between two separate forecasts for the county. The first forecast is a status quo forecast which assumes that Pharmacia maintained its 2000 level of operations in the county, while the alternative forecast estimates the level of economic activity that would occur in the county in 2000 without the presence of Pharmacia. Please note that the last year of historical data in the model is 1999, making 2000 the first "forecasted" year.

Pharmacia performs a wide range of activities in Kalamazoo County including the manufacture of pharmaceuticals, the research and development of new drugs, and the management and administration of its regional activities. Each of these activities impacts the county's economy differently. In assessing the company's economic impact on the county, the impact of each of these activities was estimated individually as shown in Table 4. In 2000, approximately 1,200 temporary employment agency employees worked at Pharmacia. Although these individuals were not company employees, their livelihood as well as the consumer service employment generated through their consumer expenditures were dependent on Pharmacia.

Table 4
Employment Impact by Activity

Activity	Direct	Indirect	Total
Production	2,595	5,313	7,908
Administration	594	512	1,106
Research and Development (inc. Animal Health)	1,819	1,157	2,976
Other	843	601	1,444
Temporary workers (approx. 1,200)	0	1,371*	1,371
Total	5,851	8,954	14,805

*Includes both the 1,200 temporary workers at Pharmacia and the 172 additional workers in jobs generated through their consumer purchases.

Source: Pharmacia & W.E. Upjohn Institute

Comparison Analysis with Pharmacia's Estimated 1999 Economic Impact

The W.E. Upjohn Institute estimated Pharmacia's 1999 economic impact on Kalamazoo County in January 2001. In 1999 the pharmaceutical company employed 5,557 workers, which was 5 percent lower than its 2000 workforce. The company's estimated employment multiplier was 2.6 in 1999, which is very similar to its 2000 employment multiplier of 2.5.

In 1999 study, we reported that Pharmacia contributed \$1.54 billion (current 1999 dollars) to the county's Gross Regional Product. Unfortunately, this estimate was in error due to using an incorrect price index. Pharmacia's impact on the county's GRP should have been reported as \$1.46 billion.

This year, Pharmacia's estimated impact on the county's GRP is a lower \$1.03 billion (current dollars). The sizeable difference between the two years is due to both the annual updating of our model and, more importantly, our revised estimation procedure. Each year, the Institute updates its REMI model, and each update contains new labor productivity estimates and new inter-industry linkage estimates; both of these can impact the model's GRP estimates. Finally, this year we revised and hopefully improved our procedure in allocating the company's various activities into their proper industrial classifications. In past studies we placed all of Pharmacia's activities into the model's drug manufacturing sector, which clearly misrepresented the impact of its administrative and research and development activities. If we were to use the former 1999 methodology, Pharmacia's 2000 impact on the county's gross regional product would be measured at \$1.53 billion in 1999 dollars, a 4.8 percent increase over the 1999 level..