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A CASE STUDY OF THE ECONOMIC IMPACT OF THE
3M COMPANY ON THE BROOKINGS COMMUNITY

BY

DWIGHT G. UHRICH

A thesis submitted
in partial fulfillment of the requirements for the
degree Master of Science, Major in
Economics, South Dakota
State University

1974

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This thesis is dedicated to my wife, Charlotte, who, along with my children, endured the financial sacrifice necessitated by the time frame of the project.

DGU

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CHAPTER I

INTRODUCTION AND STATEMENT OF THE PROBLEM

INTRODUCTION

Most communities, either implicitly or explicitly, attempt to increase net income thereby attaining a higher standard of living. This goal is accomplished by stimulating economic activity, which often is subsequently followed by increased population. This phenomenon is known as economic growth or more commonly just "growth," meaning more business and more income. Some communities are even confronted with a steady decline in economic activity. This is especially true for many rural areas. The symptoms of such a decline are unemployment, underemployment, net outmigration, and relatively low per capita income.

Whether a community has a stagnant or declining economic base, one widely sought way of stimulating the local economy is through industrial development. Civic associations and local, state, and federal government agencies sponsor promotional programs to encourage industry to locate in rural areas. These public and private efforts are based on the assumption that industry can induce sufficient economic activity to increase total net income and effectively reduce unemployment, underemployment and net outmigration.

For more than 100 years, both industry and people have developed in and migrated to our great metropolitan areas. This concentration of people, commerce, and manufacturing has produced serious problems of poverty, pollution, and low quality living.

At the same time, the expanse of rural America begs for people to enjoy air, space, and water, as the "communities of tomorrow." Can the trend toward concentration be reversed or substantially

modified? Can industry and business establish efficient operations in the smaller cities, towns, and countryside? Do many people really want to live in a rural environment? Perhaps the answers are all "yes," but to what extent?¹

As a result of modern technology, economic growth and activity is not confined to major seaport and rail center locations. Some of the major disadvantages of rural areas have been overridden by the availability of communications, transportation, and electrical power. The standard of living that Americans will enjoy depends on the design of our economic structure. If rural areas present opportunities for economic growth, technology has given America the flexibility to structure economic activity there. Nevertheless, many rural areas have, or are anticipated to have, an outflow of human capital, shrinking employment base, high dependency rates, and inadequate or prohibitively expensive community services.

In recognition of the low current birth rate and severe problems of providing adequate community services to residents of sparsely populated areas and to densely populated inner cities, national growth policy is more concerned with the distribution of people (and where they can receive adequate services efficiently) than with the number of people in the nation. Efficiency means getting more output of goods and services per unit of input, where quantities of aggregated inputs and outputs are weighted by prices that reflect social benefits or costs.²

Even though many rural communities are successful in expanding

¹/E.C. Weitzell, Planning For Rural Industry, U.S.D.A., Federal Extension Service, PA-894, (Washington, D.C.: U.S. Government Printing Office, April, 1969), p. 6.

²/Luther Tweeten, "Emerging Issues For Sparsely Populated Areas And Regions Under A National Growth Policy," (paper presented at the meeting of the American Agricultural Economic Association, Edmonton, Canada, 1973), p. 5.

their economic base, some are not aware of, or intentionally overlook, the social costs of subsidizing industry with low wage labor, tax exemptions, low interest loans, or other inducements. In order to determine whether or not net economic impacts are in fact positive, these costs must be subtracted.

Problems of resource development for states and communities are many and varied. One resource which is perhaps the key to economic development is the labor force, that is, the input of human manpower. Midwestern states . . . have become acutely aware of the impact of declining agricultural employment, and the rural-to-urban migration that often accompanies this decline. In an effort to prevent such losses, many areas have become actively engaged in various efforts, one important activity being recruitment of new industries into the local region. Various hurdles must be overcome in order to guide industry location to an area. Awareness of the advantages and resources -- labor being a very significant factor -- must be made on the local level. Herein lies one of the tallest barriers: the lack of available, relevant, and organized local labor force information. While indeed there is a myriad of national and an extensive amount of state data available on labor, local areas are often neglected other than to merely describe the labor force in general, aggregate terms.³

This study does not encompass a comprehensive analysis of the local and/or regional labor force. However, it is worth noting the related problem areas of unemployment and underemployment.⁴ There are many persons whose labor is underutilized, and whose incomes consequently are far below what they might be.

Although underemployment, like unemployment, exists throughout the nation, available evidence indicates that the region's degree

^{3/}Harlan Stuart Abrahams, Determination of Local Labor Information, U.S. Department of Commerce, Resource Development Internship Project, (Bloomington, Ind.: published under the auspices of the Midwestern Advisory Committee on Higher Education, Sept., 1971), p. 2.

^{4/}For a discussion on employment the reader is referred to: Roger W. Spencer, "High Employment Without Inflation: On Attainment of Admirable Goals," Federal Reserve Bank of St. Louis Review, reprint series no. 71, (St. Louis, Mo.: Federal Reserve Bank, Sept., 1971).

of underemployment of its human resources exceeds the nation's. Underemployment differs from unemployment only in that human resources are utilized to some extent. An unemployed person cannot find work. An underemployed person can find less work than he would like: either he works fewer hours or his productivity is lower than he could attain were his present abilities fully utilized.

Underemployment leads to lower incomes than would be attained were human resources more fully utilized. For this reason, underemployment like unemployment, is a major policy problem. It is, however, far more difficult to quantify the degree to which incomes are lost through this form of waste than it is to estimate the loss from open unemployment . . . some members of . . . farm families [small scale farming with resources insufficient to utilize available labor] manage to find off-farm employment, but many do not. Many would be willing to take on additional work if they could find it. Even those who do locate off-farm employment are often unable to find as much as they desire.

[The] low participation form of underemployment is hidden because people do not look for jobs. They know there is a lack of employment opportunities, so they withdraw from the labor force. They are not counted as unemployed, but represent one aspect of the potential expansibility of the region's labor supply.

It is extremely difficult to estimate the number of people who are not in the labor force because of a lack of job opportunities. The region's below average age - specific participation rates, outside of Minnesota, suggest that the number may be large.⁵ A pilot study of the "secondary labor force" in Jamestown, North Dakota, area found that a 31 percent expansion of the labor force could be accomplished with people currently residing in the area. Low labor force participation in the region's rural areas, where employment opportunities are not available as readily as in urbanized areas, is particularly in evidence for females.⁶

Unemployment and underemployment, with their related side-effects of lower wages and lower living standards, and resulting symptoms of outmigration, have been long standing and perplexing problems for

⁵/The region in this reference study includes Montana, North Dakota, South Dakota, Minnesota, 26 counties in northwestern Wisconsin, and Michigan's upper Peninsula (the area coincident with the Ninth Federal Reserve District).

⁶/James M. Henderson and Anne O. Krueger, National Growth and Economic Change in the Upper Midwest, (Minneapolis, Minn: University of Minnesota Press, 1965), pp. 65-66.

South Dakota, particularly since the advent of modern agricultural technology. Two recent studies have reported on the outmigration problem and the effects of changing technology as follows:

People have not made location decisions consistent with their preferences. A nationwide Gallup Poll in 1972 found that about half of all persons interviewed preferred their current place of residence, but the percentage dropped from 80 to 55 to 39 percent, respectively, from rural to small urban to large urban center residents. Whereas 90 percent of rural residents who were past rural residents preferred rural residence, only 46 percent of large urban residents who were past large urban residents preferred their current place of residence. Only 27 percent of past rural residents living in large urban centers at the time of the poll preferred to reside in that setting. Moreover, disenchantment with the city is growing. The proportion of respondents preferring city life fell from 22 percent in 1966 to 13 percent in 1972 while the proportion preferring rural residence increased from 49 percent to 55 percent.

The principal reason stated by respondents for not carrying out their preferences were [sic] economic. The wishes of the people appear to be secondary -- the location of people depends on the location of jobs (and public assistance) which in turn depend on the decisions made by firms and public officials. Empirical evidence is mounting in support of this proposition anticipated by Paul Barkley in his statement that "to be employed at all, the book editor must follow his firm to New York even though he himself despises that metropolitan area." Equations accounting for movement of farm labor repeatedly find explanatory variables measuring availability of jobs rather than wage rates to be dominant. Census data again document the dominance [sic] of job availability over income levels in explaining gross migration patterns among states.⁷

. . . In the brief period of 15 years, from 1950 to 1965, new machines and new methods increased farm output in the United States by 45 percent - and reduced farm employment by 45 percent. . . . During the next 15 years the need for farm labor will decline by another 45 percent. Changes like these on the farm are paralleled on a broader front throughout rural America, affecting many activities other than farming and touching many more rural people than those on farms.⁸

⁷/ Tweeten, National Growth Policy, pp. 11-12.

⁸/ Edward T. Breathitt et. al., The People Left Behind, a report by the President's National Advisory Commission on Rural Poverty, (Washington, D.C.: U.S. Government Printing Office, Sept., 1967), p. ix.

[In 1967 the President's National Advisory Commission recommended] . . . that the United States adopt and put into effect immediately a national policy designed to give the residents of rural America equality of opportunity with all other citizens. This must include equal access to jobs, medical care, housing, education, welfare, and all other public services, without regard to race, religion, or place of residence.⁹

(Efforts have been made through private industry, local, state, and federal governments, and/or a combination thereof to accomplish that recommended national goal, commonly through an Industrial Development Corp., to provide the means for the rural population to share the abundance of America.) However, the economic rationality of a community's efforts or desire to attract new industry can and should be approximated through the exposure of costs and benefits of various alternatives. The citizens are then in a position to make better choices. The purpose of this thesis is to implement an economic model which will estimate the costs and benefits (i.e., the economic impact) that the Minnesota Mining & Manufacturing Co. has had and/or is having on the Brookings economy. The model and the findings of the study can then be used to guide decision makers concerning the feasibility of future economic additions and expansions to the local economy.

STATEMENT OF THE PROBLEM

Communities can pursue a program of industrial development by attracting new industry and/or encouraging the expansion of existing industry. Either way the decision by a community to initiate an industrial development program should be based on sound economic principles

^{9/}Breathitt, op. cit., p. xi.

and data. Shaffer felt that a community should consider two sets of questions before actively assisting additional industry to locate within the community. "The first set of questions pertains to the feasibility of the business. The second set of questions involves determining the economic impact of the business on the community."¹⁰ The first set of questions is not within the scope of this study, however, the second set will be considered.

The second set of questions that the community should ask are [sic] those relating to -- What type of impact will the plant have on the community? Who will be affected -- workers, property owners, merchants? What additional revenues and expenditures for municipal government or schools can be expected? How many new residents can be expected? Is the local labor force adequate?¹¹

In addition to the feasibility and economic impact considerations stated above, industrial development programs are further influenced by the concept of growth centers and population changes.

In recent years, many industrial planners and Government officials have placed great emphasis on the concept that economic growth should be planned around established and proven "growth centers." The basic contention is that it is more economical and less risky to make both Government and private investments in and around those centers which are already recognized as having substantial locational values and advantages. On this basis, Congress has authorized, through the Public Works and Economic Development Act and other legislation, the establishment of economic development districts around designated growth centers.¹²

Such designated areas are eligible for 70 percent federal matching funds for improvements in the primary highway system. Two

¹⁰/Ron E. Shaffer, Evaluating the Economic Impact of New Industry on Wisconsin Communities, Department of Agricultural Economics, University of Wisconsin - Extension, (Madison, Wisc.: University of Wisconsin, undated), p. 1.

¹¹/Ibid., pp. 1-2. ¹²/Weitzell, op. cit., p. 7.

designated growth centers in South Dakota are Yankton and Brookings.¹³

Of the three factors affecting population changes - fertility, mortality, and migration - the latter has had the greatest influence on the Upper Midwest. Each Upper Midwest state experienced a net outmigration between 1960 and 1970 (i.e., more people moved from, than into, each state). North Dakota and South Dakota experienced the highest outmigration rates with 15.0% and 13.6% of their 1960 populations respectively...¹⁴

Overall, South Dakota experienced a decline of 2.2 percent in its population during the 1960-70 decade.¹⁵ During the same time frame the urban area¹⁶ of Brookings experienced a population increase of more than twice the national average of 26.6 percent.¹⁷ The projected population for urban Brookings is 20,900 by 1985, a 46 percent increase from the 1970 census count of 14,300.¹⁸ This growth will be induced and supported largely by an expansion of existing industry (currently Brookings is the home of 26 manufacturers and processors)¹⁹ and/or the introduction of additional industry into the community.

^{13/}An undated fact sheet, Brookings Area Chamber of Commerce, Brookings, South Dakota.

^{14/}Neil C. Gustafson, Recent Trends/Future Prospects, A Look At Upper Midwest Population Changes, Upper Midwest Council, (Minneapolis, Minn: Upper Midwest Council, Federal Reserve Bank Building, Jan. 1973), p. 9.

^{15/}Ibid., Table 1, p. 4.

^{16/}Urban area population represents municipal population plus adjacent non-farm population.

^{17/}Gustafson, op. cit., pp. 10-11. ^{18/}Ibid., Table 12, p. 50.

^{19/}Manufacturers and Processors, Brookings South Dakota, fact sheet prepared by the Brookings Area Chamber of Commerce, Brookings, S.D., 1973. ✓

In 1970, Minnesota Mining & Manufacturing Co. of St. Paul, Minnesota, located a branch plant (Medical Products Division) in Brookings according to their usual business practices.²⁰ This study is concerned with estimating the annual economic impact of this industry on the economy of the Brookings Community. Due to expansion plans and possible addition of more new industry to the economic base, Brookings is confronted with making the determination of what costs will be incurred and what benefits can reasonably be expected from the added industry. Estimates of costs and benefits obtained comprise vital economic data needed to determine whether or not this particular addition to the economy has been beneficial and whether or not inducements are warranted for future additions to the economy.

OBJECTIVES

The general objective of this study was to implement a model which measures changes in the Brookings Community's private and public sectors induced by the addition of Minnesota Mining & Manufacturing Co.²¹ to the local economy and to estimate the annual economic impact. Specifically the objectives were as follows:

- 1) To develop an economic profile of employees.
- 2) To determine the net gain (loss) to the community's private sector.

²⁰/Private firms locate in a manner consistent with economic efficiency which includes various considerations of the general location, labor, site, buildings, transportation, public services, taxes, housing, medical and dental facilities, and social climate.

²¹/Hereinafter, Minnesota Mining & Manufacturing Co. is referred to as the 3M Company or 3M.

- 3) To determine the net gain (loss) to the municipal sector.
- 4) To determine the net gain (loss) to the school district sector.
- 5) To determine the net gain to the total community.

REVIEW OF LITERATURE

The introduction of industrial and/or government installations to an area can create prodigious alterations in resource use, particularly if the installation is relatively large. An extensive five case study was completed in 1965 by Gerald Breese.²² He found that almost invariably, past examples of large installations revealed an impact of tragedy, waste, and stress and strain for the nearby population. Breese felt that "The replication of such mistakes is inexcusable since the lessons of previous experience in impressively parallel situations are available for study."²³ Breese's analysis of the impact of large installations on nearby areas was undertaken, first, to identify both the characteristics of impact patterns and the devices for anticipating related events and issues, specifying their nature and importance. Stress is placed on the critical early years of the impact situation, for it is then that the characteristics of forth-coming changes begin to become evident and harbingers for the future become clear. The second objective was to suggest procedures or methods for dealing effectively

²²/Gerald Breese et. al., The Impact of Large Installations on Nearby Areas, Accelerated Urban Growth (Beverly Hills, Calif: Sage Publications, Inc., 1965).

²³/Breese, op. cit., p. 1.

with the impact situation during its various stages of development, particularly in the critical early years.

Breese found that in large installation impact situations, events tend to follow a common sequence or pattern. Although there is a high uniformity in the sequence, there may be a considerable difference in the time between each stage in the sequence and also the time internally to each stage which has to be devoted to it, depending upon numerous case-specific factors that vary from time to time. In particular impact situations, some stages are either skipped or transposed in their order in a minor way.

The following list presents the sequence of events or patterns likely to take place in an impact situation:

- Demonstration of Need for Facility
- Site Search and Selection
- Rumor--Leaks
- Beginning of Contact: New Use and Host Area Community Action
- Acquisition--Direct or Via Condemnation
 - Speculation in Land Values, Private Construction, and Business Activity
 - Displacement of Old Uses and Population
- Construction
- Operations Phase
 - Initial Occupancy
 - General Rapid Acceleration
 - Full-Scale Operation
 - Fluctuations in Operation
 - Change in Use
- Close-Out Phase²⁴

Breese goes on to discuss each of the above stages in sequence. However, the review will be limited to the stage of General Rapid Acceleration to Full-Scale Operation since this is the gist of the

²⁴/Breese, op. cit., pp. 594-595.

present study.

General Rapid Acceleration to Full-Scale Operation. The initial occupancy stage is devoted to necessary arrangements essential to the build-up to full-scale operation and the general rapid acceleration which leads to it. This is the phase during which the host area and the new installation find their most crucial test of communication and contact. It is the period during which the greatest demands will be placed upon the host area to supply facilities, housing, and other necessary conveniences for the new population. It is here that the greatest stresses and strains will be developed, and where the lags between need and provision are most likely to be acute.²⁵

The facilities that fall into the realm of the present study are included in the public sector which includes education, transportation facilities, and public works (sewer, water, fire and police protection).

Charles H. Little authored a report which explained the theory and development of investment and employment multipliers.²⁶ He went on to present these figures for the Southern Region and two small cities in Oklahoma. His findings included upper and lower estimates, as discussed in the development of the methodology, depending on which of two methods were selected for computing the investment and employment multipliers. Little went on to present an analysis using a hypothetical example for the purpose of demonstrating the utilization of investment and employment multipliers. The employment multiplier is not undertaken by this study, however, the general concept of the multiplier, and specifically the investment multiplier, is essential to an economic impact study and is therefore discussed in a later chapter.

²⁵/Breese, op. cit., p. 597.

²⁶/Charles H. Little, A Method to Determine Effects of New Investment on a Community, (Oklahoma State University Experiment Station, Processed Series P-551, November, 1966).

In 1970, Gary L. Curtin completed a study which gave a framework for an economic impact study of Ellsworth Air Force Base on the Rapid City, South Dakota area.²⁷ His objectives were to define the study area and determine a framework for the analysis of the impact of Ellsworth on its surrounding area so that, should the air base ever be phased out, local authorities could have vital additional information concerning their economic structure for community growth and development planning. Curtin used recorded and estimated employment and payroll figures for some eighty Standard Industrial Classification (SIC) Codings on an annual basis for a hypothetical eleven year period. He found that the total impact could conceivably be estimated through the solution of equations containing payroll and non-payroll impact computations, even though a portion of the pertinent data required had to be estimated. Curtin's research made it evident that many communities of South Dakota are lacking in pertinent data for economic planning purposes. This study will attempt to demonstrate that data, at least on a localized basis, can be obtained, and serve as a useful tool in economic development planning.

In 1973, Erick Camp completed a research paper which had the primary objective of evaluating the direct economic impacts that Guerdon Industries, Inc., had on Madison, South Dakota and the surrounding

²⁷/Gary L. Curtin, "A Framework for the Analysis of the Economic Impact of Ellsworth Air Force Base on the Rapid City, South Dakota Area" (unpublished M.S. research paper, South Dakota State University, 1970).

area.²⁸ Camp used a multiple linear regression model in an attempt to develop a benefit/cost analysis. He was successful in the development of the model, however, the nonavailability of portions of essential primary data, known but not disclosed by private industry, diminished the intended scope of the study. The importance of Camp's study is in the reinforcement of some of the findings that Breese had (p. 10) in that the community of Madison, South Dakota, was attempting to foster industrial growth while simultaneously experiencing an economic decline, i.e. the close-out phase of an industry vital to its economic base.

In 1972, a program designed by the citizens of the Brookings area to plan and affect the future of their community was published.²⁹ The subjects presented in the report are: area government, cultural activities, design of the area, economic development, elementary and secondary education, health and welfare, higher education, housing, public safety and protection, recreation and entertainment, and transportation and communication. The publication, which presents goals of the community, is informative in each of the subject areas listed above. Some costs and operating budgets are given for selected years. Thus, through this publication and other information available at the Brookings Area Chamber of Commerce Office, average costs to a prospective installation

^{28/} Erick James Camp, "A Case Study of the Impact of Guerdon Industries, Inc., on Madison, South Dakota" (unpublished M.S. research paper, South Dakota State University, 1973).

^{29/} Brookings Area Betterment (B.A.B.) June, 1972. On file at the Brookings Area Chamber of Commerce, Brookings, South Dakota.

can be ascertained. The present study is an attempt to estimate the costs and/or benefits to the community.

Donald Kettering undertook a research project in 1970 with the following objectives:³⁰ Development of an input-output model for Brookings County plus the cities of Arlington and Flandreau, formulation of an input-output model to depict the interrelationships of the economy, development of multipliers for the various sectors of the economy, demonstration of the use of an input-output model for predictive purposes, and establishment of the present economic base as a reference point for future studies. Within his writing three tables were formulated: A Transaction Table, a Trade Coefficients Table, and an Inverse Table. Each table is based upon the interacting purchasing and selling activities of 27 economic sectors which Kettering felt would encompass the economic base of the study area and into which all respondent firms could be respectively categorized.

The Transaction Table for the Brookings Study Area contains the dollar volume of transactions that respondents from each sector purchased from the other sectors in the study area. The Trade Coefficients Table indicates that for each dollar spent in the study area by a given sector, "x" amount of that dollar goes to each of the twenty-six remaining sectors. The Inverse Table, also known as an Interdependence Coefficient Table, gives a multiplier that denotes both the direct and indirect effect that one sector has on another. Kettering successfully obtained

³⁰/Donald L. Kettering, "An Economic Analysis of the Brookings Study Area" (unpublished M.S. thesis, South Dakota State University, 1970).

his stated objectives with the implication that the effects of industrial growth on an economy can be determined, and that market structures can be identified. The important relationship of Kettering's work to the current study lies in the use of the trade coefficient for the household sector, as developed in his analysis, as the estimated multiplier for Brookings County.

Ron E. Shaffer, Community Development Economist, currently with the University of Wisconsin, developed the "Model of Community Net Gains (Losses)" as a method of evaluating the economic impact of additional industry on communities.³¹ The model is divided into the public sector and private sector, with the public sector subdivided into the municipal sector and school district sector. The model solutions are in dollar and cents terminology which was Shaffer's intent, so that a layman could understand and utilize the model in practical application even though its foundations lie in the mists of meta-economics. With minor adjustments to accommodate the local situation, the model was essentially unchanged in this study.

Shaffer co-authored a study with Luther Tweeten involving the application of the "Model of Community Net Gains (Losses)" in selected rural communities in Eastern Oklahoma.³² The study concerned 12 new or

³¹/Ron E. Shaffer, Evaluating the Economic Impact of New Industry on Wisconsin Communities (Madison, Wisc: University of Wisconsin - Extension, undated).

³²/Ron E. Shaffer and Luther Tweeten, "The Net Economic Impact of Industrial Expansion on Rural Communities in Eastern Oklahoma," (preliminary draft, courtesy of Ron Shaffer, Madison, Wisc., 1973).

expanding industrial plants in five different communities. Shaffer used simple correlation and multiple regression analysis with a variety of other statistical treatments in an attempt to detect national implications. Due to the sheer size of Shaffer's project, it is beyond the scope of this study; however, when enough studies of this type are concluded in South Dakota, the further treatment of collected data, as conducted by Shaffer in the Oklahoma study, could conceivably have significant influence on rural industrialization policy.

CHAPTER II

THEORETICAL FRAMEWORK AND MODEL FORMAT

ECONOMIC BASE THEORY

Bilas defines a market as "...a place where buyers and sellers come together to buy and to sell their resources and goods and services."³³ Economic base theory subdivides the market for any given geographic area into two sectors. These sectors are known as the export sector and the nonexport sector and all economic entities within the defined area are categorized as basic industries and service industries respectively. Service industries derive their revenue by supplying the export or basic industries with resources and goods and services. Most of the revenue of basic firms is derived from the sale of resources and goods and services outside the local or defined area.

If an industrial development program is concerned only with expanding the capacity of service industries, the result normally will be only the redistribution of sales and not an increase in total sales, although a small net gain may be realized through increased efficiency. By contrast, an industrial development program concerned with increasing the total sales of the basic industries, either through expanding the capacity of existing firms or by attracting additional industry to the local economy, induces additional income into the community. This additional income has an accumulative economic impact on the community

³³/Richard A. Bilas, Microeconomic Theory (New York: McGraw - Hill Book Company, 2nd ed., 1971), p. 4.

exceeding the initial change as the money goes through spending and respending cycles. Multipliers have been developed to estimate the sum of all the spending and respending without adding individual transactions.

MULTIPLIERS

The investment multiplier is some number, K , which, when multiplied by new investment gives the change in total income. The change in investment is represented by ΔI and the change in income by ΔY . The total income induced by the change in investment is:

$$\Delta Y = K \Delta I$$

The investment multiplier accounts for both the primary and secondary effects of a new investment. The initial investment is the primary effect. The recipients of the initial investment spend part of the money and save the remainder. The recipients of these expenditures in turn spend a part of the income they receive and save the rest and so on through a number of spending and respending cycles. This chain reaction is the secondary effect. Application of the multiplier computes the summation of these two effects, and the result is the total change in income resulting from the initial investment.

The amount that each recipient group spends depends on what is called the marginal propensity to consume, which is defined as the ratio of the change in consumption expenditures to the change in income. It measures the amount consumption expenditures will increase as income is increased. The multiplier is a function of the marginal propensity to consume, which, when other factors are held constant, depends upon the

level of income. The following is the theoretical derivation of the investment multiplier in a simplified economy:

Let Y = total income in an area
 C = total consumption
 S = total savings
 I = total investment

The basic equations are: 1) $Y = C + S$
 2) $S = I$
 3) $C = f(Y)$

Equation (3) states that consumption is a function of income.

From the above equations,

$$\begin{aligned} 4) \quad \Delta Y &= \Delta C + \Delta S \\ 5) \quad \Delta S &= \Delta I \\ 6) \quad \Delta C &= \frac{dC}{dY} \Delta Y \end{aligned}$$

where $\Delta Y, \Delta C, \Delta S$, and ΔI are respectively the change in Y, C, S , and I , and $\frac{dC}{dY}$ is the derivative of C with respect to Y .

Substituting equations (5) and (6) into equation (4),

$$7) \quad \Delta Y = \frac{dC}{dY} \Delta Y + \Delta I$$

solving for ΔY ,

$$8) \quad \Delta Y \left(1 - \frac{dC}{dY}\right) = \Delta I$$

$$9) \quad \Delta Y = \frac{1}{1 - \frac{dC}{dY}} \Delta I$$

$$10) \quad \Delta Y = K \Delta I$$

where K is the investment multiplier.

The derivative $\frac{dC}{dY}$ is the marginal propensity to consume (MPC).

Taking the total derivative of equation (1) with respect to Y ,

$$11) \quad 1 = \frac{dC}{dY} + \frac{dS}{dY}$$

$$12) \quad 1 = \text{MPC} + \text{MPS}$$

where $\frac{dS}{dY}$ is the marginal propensity to save (MPS). From equation (12)

$$13) \quad \text{MPS} = 1 - \text{MPC}$$

From equation (9) $\frac{1}{1 - \frac{dC}{dY}} = K$

From equations (11) and (12) $\frac{dC}{dY} = MPC$

Therefore $\frac{1}{1 - \frac{dC}{dY}} = \frac{1}{1 - MPC}$

From equation (13), $MPS = 1 - MPC$

Substituting MPS for $(1 - MPC)$ into the expression $\frac{1}{1 - MPC}$ yields $\frac{1}{MPS}$

Therefore,

$$14) K = \frac{1}{MPS}$$

For illustrative purposes assume a MPS of .33. Then the investment multiplier,³⁴ K , will equal 3. $K = \frac{1}{MPS} = \frac{1}{.33} = 3$

$$\begin{aligned} \text{Let } \Delta I &= \$100 \\ \Delta Y &= K \Delta I \\ \Delta Y &= (3) (\$100) \\ \text{then } \Delta Y &= \$300 \end{aligned}$$

The accumulative effect can be calculated by using the following equation:

$$\Delta Y = \Delta I + MPC (\Delta I) + \sum_{i=2}^n MPC (\Delta Y_{i-1})$$

where \sum denotes the summation of MPC times each succeeding change in income "n" number of times. Table 11-1, on pp. 22-23, depicts the primary and secondary effect and the total change in income induced by an investment change of \$100.00, assuming a multiplier of three.

^{34/}For illustrative purposes the procedure for presenting the multiplier concept was kept as simple as possible. There are numerous works on multiplier theory. The reader who wishes to pursue the subject further is referred to John Maynard Keynes, The General Theory of Employment, Interest and Money (New York: Harcourt, Brace and World, Inc., 1965).

Table II-1. Total Change in Income Induced by a \$100.00 Change in Investment Assuming a Multiplier of Three.*

Change in Investment	ΔI	\$100.00	Primary Effect
1	ΔY_1	66.67	
2	ΔY_2	44.45	
3	ΔY_3	29.63	
4	ΔY_4	19.75	
5	ΔY_5	13.17	
6	ΔY_6	8.78	
7	ΔY_7	5.85	
8	ΔY_8	3.90	Secondary Effect
9	ΔY_9	2.60	
10	ΔY_{10}	1.73	
11	ΔY_{11}	1.15	
12	ΔY_{12}	.77	
13	ΔY_{13}	.51	
14	ΔY_{14}	.34	
15	ΔY_{15}	.23	
16	ΔY_{16}	.15	
17	ΔY_{17}	.10	
18	ΔY_{18}	.07	
19	ΔY_{19}	.05	
20	ΔY_{20}	.03	

Accumulative Change in Income

Table II-1 (continued)

Change in Investment	ΔI	\$100.00
21	ΔY_{21}	.02
22	ΔY_{22}	.01
.	.	.
.	.	.
<u>n</u>	<u>n</u>	<u>n</u>
sum	ΔY	\$300.00

*MPC = .66.

derived is inflated and should be viewed as an upper limit of the local changes that can be expected to occur. Within the realm of this study the most significant change is that of import purchases.

It is noted that the investment and employment multipliers as developed in the current study. However, the concept employed in the analysis is based on the findings of a previous study and it is essential that an understanding of the theoretical background be obtained. The original questionnaire was designed to determine the reasons for the Public Relations Staff's response to the question, "A suitable alternative method of determining the multiplier to obtain an estimated economic effect of investment and employment."

35/Chart 1. The Economic Effects of Investment on a Community. University Experiment Station, Processed Series Number, 1954, p. 3.

The employment multiplier is similarly defined. Let the employment multiplier be "t" then $\Delta E = tJ$, where ΔE is the change in total employment and J stands for the number of new jobs. Again, the multiplier sums the primary and secondary effects. The new jobs created constitute the primary effect. These employees in turn buy goods and services from other firms, whose employees in turn buy goods and services from other firms and so on. The increase in demand for goods and services increases the demand for employees, and this is the secondary effect.³⁵ The sum of these two effects is the employment multiplier effect.³⁶

LEAKAGES

Macroeconomic theory recognizes that in any given economy a portion of the income flow is removed through saving, taxation, and import purchasing. A phenomenon or action of this type is termed as a leakage from the economy. The theoretical derivation of a multiplier in a simplified economy assumes no leakages and therefore a multiplier so derived is inflated and "...should be viewed as an upper limit of the local changes that can be expected to occur."³⁷ Within the realm of this study the most important leakage is that of import purchases.

^{35/} It should be pointed out that the investment and employment multipliers as discussed are not developed within the current study. However, the concept is utilized in the analysis based on the findings of a previous study, and therefore it is essential that an understanding of the theoretical groundwork be obtained. The original questionnaire was designed so that an MPC could be developed. However, due to certain questions which were not acceptable for competitive reasons to the Public Relations Staff of Minnesota Mining and Manufacturing, a suitable alternative was selected to fulfill the requirements to obtain an estimated economic impact.

^{36/} Charles H. Little, A Method to Determine Effects of New Investment on a Community, (Oklahoma State University Experiment Station, Processed Series P-551, November, 1966). p. 3.

^{37/} Shaffer, Impact on Wisconsin Communities, p. 6.

Import purchases occur when consumers spend all or part of their income on resources and goods and services outside the community. Some factors affecting the amount of import purchases are place of residence, selection of goods and services available, prices, shopping facilities, and merchant-customer relationship. This form of leakage from the local economy can be estimated by categorizing spending patterns geographically by percentage of income spent in the community, in the county but not in the community, and outside the county. Whether a particular addition to the local economy has a net positive economic impact or not depends largely on the percentage of income derived from that addition that is spent in the community. This percentage is known as "...the propensity to consume locally,"³⁸ and is vital in the methodology used to determine the economic impact of additional industry on the local economy.

MODEL FORMAT

The Model of Community Net Gains (Losses), as developed by Shaffer, measures the actual (or anticipated) changes in a community's private and public sectors attributable to additional industry, which occurs through expansion of existing firms and/or the locating of new firms in the community, and estimates the annual economic impact of the change. "The total benefits (costs) in each sector are the sum of primary and secondary benefits (costs)."³⁹ The net gain for each sector is the difference between the sector's benefits and costs. The net

³⁸/ Shaffer, Impact on Wisconsin Communities, p. 7.

³⁹/ Shaffer, Impact on Wisconsin Communities, p. 14.

gains for each sector are summed to compute the estimated total community change induced by the expansion of an existing firm and/or the addition of new industry to the community's economy. "Positive net gains imply that the new industry has a beneficial impact on the community or specific sector."⁴⁰

An understanding of the sectors listed on pages 9-10, and their interrelationship with property taxes is essential to the application of the model; therefore a short discussion is given in the following pages on each respective subject.

Private Sector

For purposes of analysis, the area to be studied was defined in terms of political subdivisions, in this case a community, county, school district, and out-of-county area.⁴¹ Since the community is usually the political unit that initiates an industrial development program, it was the geographic focal point of the economic impact analysis.

The benefits of additional industry are the primary and secondary income and employment, and are estimated by multipliers. The benefits accruing to the community were isolated from the county benefits by adjusting the county multiplier. This was accomplished by implementing the coefficient for the propensity to consume locally.

⁴⁰/ Ibid.

⁴¹/ The use of political boundaries was necessitated due to the availability of data. It is recognized that such boundaries are traversed on a continual basis by many people for many reasons.

Another adjustment made to the benefits of the private sector was that of income loss from employment eliminated when a worker transferred from a job previously held in the community to accept employment with the additional industry. "The loss of income from unrefilled previous jobs generates a negative multiplier effect..."⁴² If the previous job terminated was refilled, and not eliminated, the community did not lose income.

The changes in the local economy that have been discussed were within the private sector and can be traced to industrialization. The impact on local government is considered next.

Public Sector

Additional industry in the community "...affects municipal government and school district revenues and expenditures."⁴³ The primary changes in the public sector are induced by additional income, residents and students. The secondary impact on the public sector occurs when community residents demand more public services. Some portion or all of the increased costs of the additional public services are funded with tax revenues which are associated with the increased economic activity initiated by the additional industry located within the community. The information needed for this portion of the analysis was collected from public records (municipal and school district budgets). The fiscal coefficients estimating the secondary revenue and expenditure changes were computed by dividing personal income for the jurisdiction into the

⁴²/Shaffer, Impact on Wisconsin Communities, p. 10. ⁴³/Ibid.

appropriate revenues or expenditures reported by the municipal government or school district.

Property Taxes

The additional property taxes from new housing and industrial investment are direct benefits to the public sector. Some communities extend property tax concessions to new plants through low assessment, freezes on future tax increases, or outright exemption by publicly owning the site and/or building. The foregone property tax revenues from these concessions are opportunity costs to the public sector (municipal government and/or school district) and are charged against the benefits of industrialization for that sector.⁴⁴

South Dakota compiled law 10-6-35.1 and .2, SD, chapter 73, House Bill 587, and SL 1970, chapter 81, section 2 allow a tax concession as an incentive for industrialization. Basically this law allows payment of 25% of assessed taxes (on real property) the first year, 50% of assessed taxes the second, and 100% the third year. Also, there is what is known in general as the Freeport Law which exempts inventories from tax assessment in an export business (not necessarily foreign). The firm in this case study has taken partial advantage of these laws, which are offered as an inducement to industry to select an industrial site within South Dakota rather than some other state.⁴⁵

Municipal Government

The primary revenues for the municipal government are the property taxes, licenses, fees, municipal utilities and hook-up charges paid by

⁴⁴/Ibid., p. 11.

⁴⁵/Tax law information was obtained from the city assessor's office, Brookings, South Dakota.

residents and private businesses in the community. The secondary revenues, for the municipal government, are the taxes associated with the additional income in the community. "Additional income in the community can affect property values, merchants' inventories, and shared state taxes."⁴⁶ Within the Model of Community Net Gains (Losses), municipal secondary revenues are estimated by the product of secondary income, induced by the new industry, and municipal revenues per dollar of personal income.

Increased primary expenditures for the municipal government are the costs of providing services to additional businesses and residents. "These services include police and fire protection, municipal utilities, streets and alleys, and sanitation."⁴⁷ The per capita municipal expenditures times the number of new residents plus expenditures for services to the industrial sites are used in Shaffer's model to estimate the primary expenditure impact on the municipal government sector. The secondary expenditures arise when residents and merchants demand more municipal services as economic activity in the community increases their income. The secondary expenditures are estimated, in the model, by multiplying the expenditures per dollar of personal income by the amount of estimated secondary income.

⁴⁶/ Shaffer, Impact on Wisconsin Communities, pp. 11-12.

⁴⁷/ Ibid., p. 12.

School District

Additional industry brings families with school age children into the community, which affects state and federal aid to the school district. Additional primary revenues (estimated by the model) in the school district are the property tax revenues from additional industrial and residential investments plus the number of additional students times the state and federal aid per average daily membership (ADM).

The provision of educational services for the additional students induces primary expenditures in the school district. Within the Model of Community Net Gains (Losses), additional primary expenditures in the school district are computed by multiplying the number of new students by the per average daily membership expenditures.⁴⁸ The estimated secondary impacts on the school district are computed using the relationship of school revenues and expenditures to personal income multiplied by induced secondary income.

^{48/} Additional students in most cases are in reality, treated at the margin. Where the impact is so large that additional structures must be built and the staff greatly expanded, the average cost would be more applicable. However the marginal cost is, at best, difficult to isolate, and the long run analysis is better served by the average cost.

Table II-2. Summary of Analysis Factors. (Shaffer's Model)

Municipal Revenues (Expenditures) Per Capita* =

$$\frac{\text{Municipal Government Revenues (Expenditures)}}{\text{Municipal Population}}$$

School District Revenues (Expenditures) Per Pupil** =

$$\frac{\text{School District Revenues (Expenditures)}}{\text{Average Daily Membership}}$$

Municipal Fiscal Coefficient Per Dollar of Income*** =

$$\frac{\text{Municipal Revenues (Expenditures)}}{\text{Personal Income for the Jurisdiction}}$$

School District Fiscal Coefficient Per Dollar of Income*** =

$$\frac{\text{School District Revenues (Expenditures)}}{\text{Personal Income for the Jurisdiction}}$$

Propensity to Consume Locally is the percent of total income spent in the community.

Multiplier (secondary effects only) =

$$\frac{\text{Income (Employment) in Nonexport Sector}}{\text{Income (Employment) in Export Sector}}$$

* Does not include property taxes, state aids, shared taxes or utility revenues and expenditures.

** Does not include property taxes, or state and federal aids.

*** All sources of revenues and expenditures (property taxes and intergovernmental aids or transfers) are included.

GEOGRAPHIC AREA OF STUDY

Due to availability of data political boundaries were utilized to delineate the various segments necessary for an analysis using the model format in this study. The four political subdivisions are out-of-Brookings County area, Brookings County, the municipality of Brookings, and the Brookings Independent School District. Each of these areas is described and presented schematically in the following pages.

City of Brookings

Brookings is the county seat of Brookings County, South Dakota, and is physically located in east-central South Dakota. The 1970 Federal Census lists a population of 13,717. The urban area of Brookings had a 1970 census count of 14,300. (See page 8 for definition and source.) A map of the city is presented in Figure II-1, page 33. For a brief, informative look at the city and its populace, the interested reader is referred to a brochure available through the local Chamber of Commerce entitled Welcome to Brookings: Don't Go Away, You're Right in the Center of a Million Things to See and Do. This leaflet depicts and/or describes public buildings, schools, recreation, churches, service clubs, Brookings area events in season, and gives a brief history of the city.

Brookings County

Brookings County is located on the eastern border of South Dakota as shown in Figure II-2, page 35. A further breakdown by township is depicted in Figure II-3, page 36, which also gives proximities of towns. The 1970 Federal Census of Brookings County is 22,158.

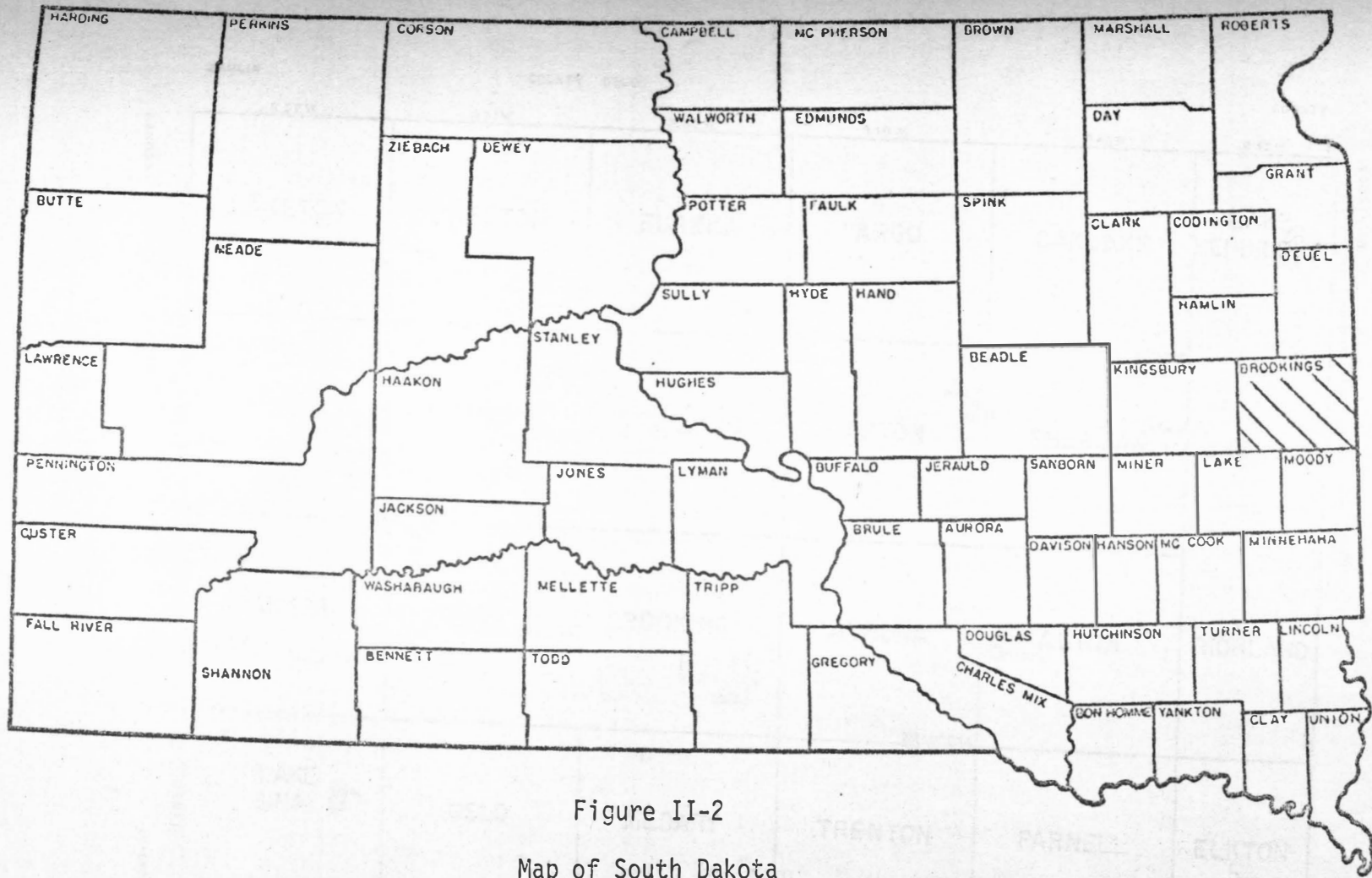


Figure II-2
 Map of South Dakota
 Showing Brookings County

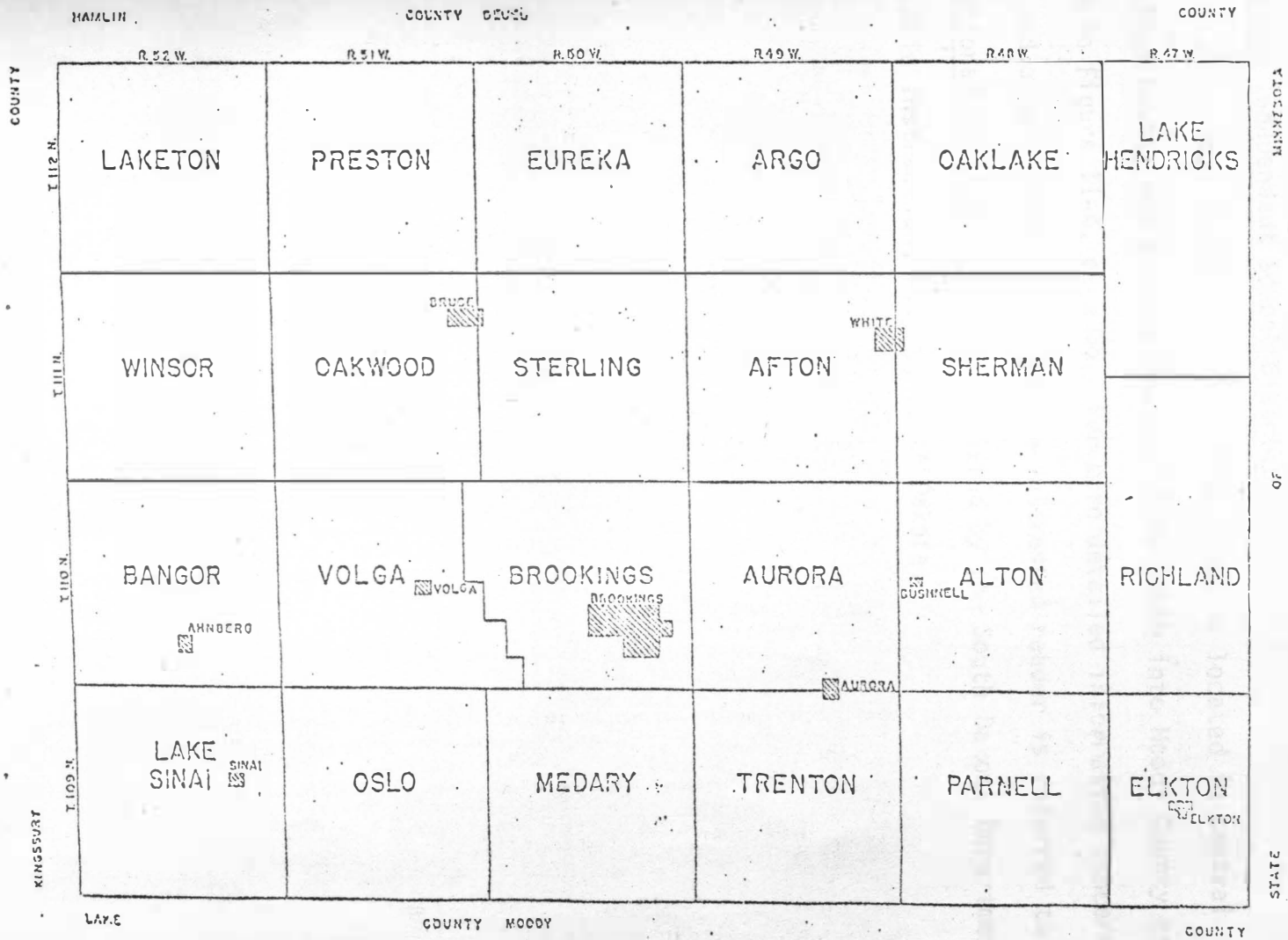


Figure II-3

Townships Within Brookings County

Brookings Independent School District

Brookings Independent School District is located in central Brookings County and extends several miles south into Moody County as shown in Figure II-4, page 38. For more detailed information concerning this and other school districts the interested reader is referred to the Educational Statistics Digest published by the South Dakota Department of Public Instruction, Pierre, South Dakota.

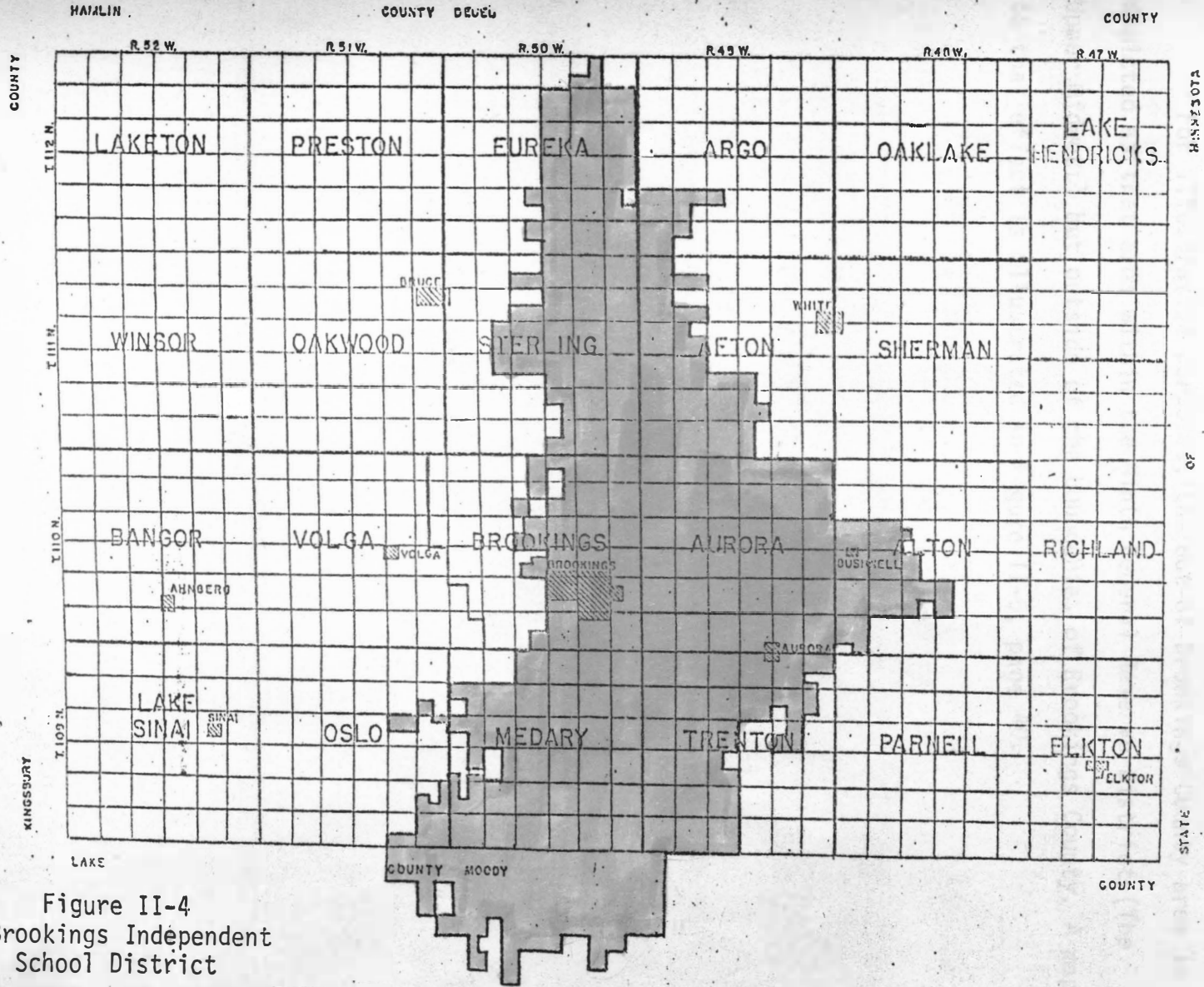
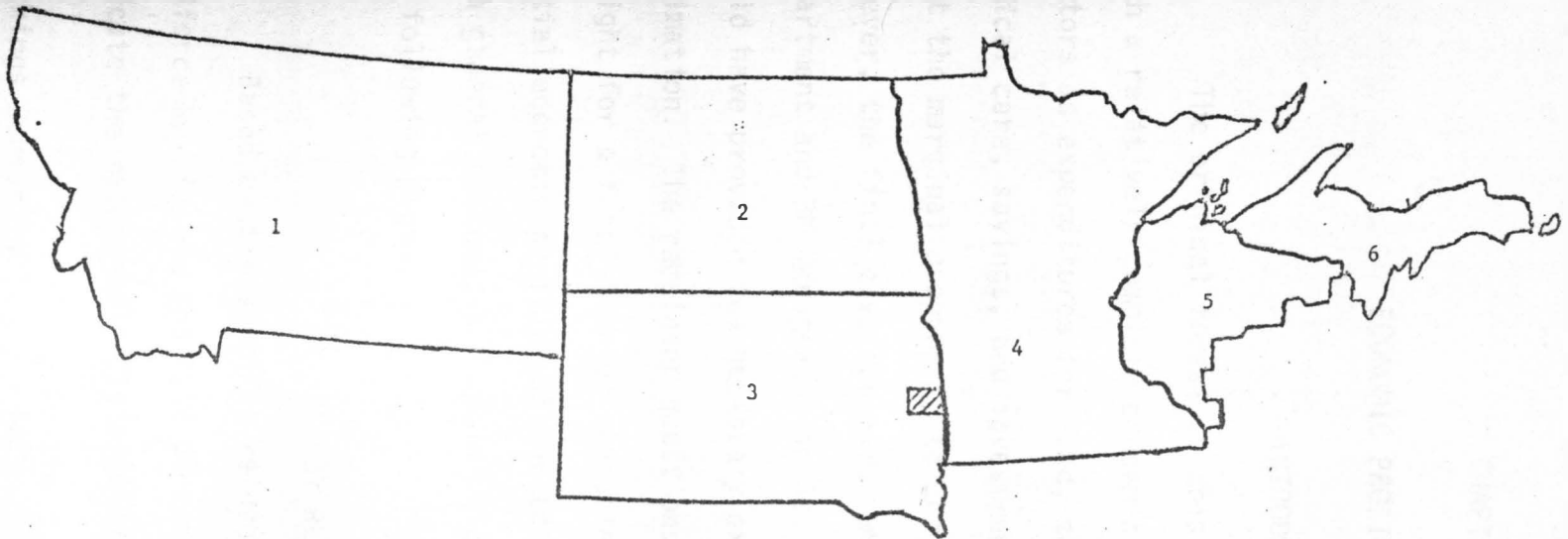


Figure II-4
 Brookings Independent
 School District

Out-of-Brookings County Area

For illustrative purposes, the out-of-Brookings County area is depicted as that area within the Ninth Federal Reserve District (The Upper Midwest) but outside of the boundaries of Brookings County. A map to that effect is illustrated in Figure II-5, page 40.



- 1) Montana
- 2) North Dakota
- 3) South Dakota
- 4) Minnesota
- 5) twenty-six counties of Northwestern Wisconsin
- 6) fifteen counties of Michigan's Upper Peninsula

Figure II-5

Brookings County Relative to the
Ninth Federal Reserve District

CHAPTER III

ECONOMIC PROFILE OF EMPLOYEES

INTRODUCTION

The original format of this thesis called for a chapter dealing with a relatively complete economic profile of the employees at 3M. Such factors as expenditures for food, shelter, transportation, clothing, medical care, savings, and investments, were to be ascertained in order that the marginal propensity to consume (MPC) could be estimated. However, the final questionnaire, which was acceptable to the Economics Department and 3M management in St. Paul, eliminated the questions which would have provided the necessary expenditure patterns utilized for MPC estimation. The remaining questions, nonetheless, did provide some insight for a tabulation of characteristics of the 3M workforce and a partial economic profile. Selected tabulations of the compiled data with general economic and sociological interpretations are presented in the following pages.

SEX BY RESIDENCE

Based on the sampling return, 53.2 percent of the total 3M workforce was female and 46.8 percent male. The following figures indicate the male-female division by place of residence:

	Female	Male	%Female	%Male
Brookings Community	132	113	53.9	46.0
Out-of-Community	42	41	50.0	50.0
Out-of-County	18	14	56.3	43.8

Thirty-one point nine percent of the workforce was commuting into the Brookings Community, which, as is demonstrated and developed in chapter four, can have significant economic impact oscillations when associated with expenditure patterns by place of residence. There's also an indication, given by the 8.9 percent of the labor force that commuted from out-of-county, that the labor force was drawn from a relatively large area. This gives a clue as to the employment alternatives available within the immediate region, with the possible conclusion that regional residents are opting for industrial type employment where it is available. The results suggest that work outside-the-home is available for women, and that 3M is utilizing what was once referred to as America's untapped workforce and brainpower source. Furthermore, the percentage split would nullify any allegation of discriminatory hiring practices, at least in gross job numbers. (See Appendix B, p. 91 for computation procedures.)

AGE STRUCTURE

Data from the questionnaire revealed an age range for both sexes of 18-60, with an average of about 30.⁴⁹ Table III-1 illustrates the breakdown of five-year age grouping by sex for the 3M workforce.

⁴⁹/Taken from S.D.S.U.'s IBM 370 computer printout using a P-STAT program.

Table III-1. Minnesota, Mining, and Manufacturing Employee Age Groups by Sex.

		Percentage by Sex									
Age:		15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64
Female		6.0	54.8	15.5	7.1	8.3	6.0	0	2.4	0	0
Male		0	16.2	24.3	14.9	12.2	9.5	8.1	5.4	8.1	1.4
		Estimated Distribution by Sex									
		15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64
Female		12	105	30	14	16	12	0	5	0	0
Male		0	27	41	25	21	16	14	9	14	2
		Estimated Percentage of Total Workforce by Sex									
		15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64
Female		3.2	29.1	8.2	3.8	4.4	3.2	0	1.3	0	0
Male		0	7.6	11.4	7.0	5.7	4.4	3.8	2.5	3.8	0.6

The most notable age group concentrations in Table III-1 are those of 20-24 for females and 25-29 for males. This may be interpreted in terms of hiring practices, stemming of outmigration from South Dakota, student wives, and availability of labor or any combination thereof.

Gustafson found that "high proportions in the age group 18-24 were apparent in counties that contain colleges, growing urban centers or military bases, and that there are few exceptions to this general pattern."⁵⁰ Brookings County meets two of the above criteria in that Brookings is a growing city and is the home of South Dakota State University which has a current enrollment exceeding 6,000.

⁵⁰/Neil C. Gustafson, *Recent Trends/Future Prospects, A Look At Upper Midwest Population Changes*, Upper Midwest Council, (Minneapolis, Minn.: Upper Midwest Council, Federal Reserve Bank Building, Jan. 1973), p. 18.

Most rural areas are experiencing a net loss of at least half of their young people between the ages of 18 and 25...the female population leaves rural areas more quickly and in greater numbers than the male population, probably because men find greater opportunities for employment on the farm.⁵¹

Since Gustafson's study was based on the 1970 Census, the high percentage of the workforce found in the age groupings 20-24 and 25-29 in Table III-1, indicates that 3M's employment pattern has tended to reduce outmigration from the Brookings Community.

EDUCATION LEVEL

For females, the education range was from 9th grade through postgraduate. For males, the range was 8th grade through postgraduate. The average education level for the sample workforce was slightly over 13 years.⁵² The following is the compilation of the sample raw data on educational level by sex and indicates that an estimated 91.8 percent of the workforce were high school graduates, 50 percent had one year of college education, and 17.7 percent had four years or more of college education:

Education Level	8	9	10	11	12	13	14	15	16	17	Row Total
Sex: Female	0	3	2	2	40	18	8	4	6	1	84
Male	5	0	1	0	26	10	10	1	16	5	74

Most areas with an outmigration problem tend to lose their educated people, commonly known as the "brain drain" from rural to urban areas.

⁵¹/Ibid., pp. 13-17. This age group for women also has a high marriage rate, which affects migration.

⁵²/Taken from S.D.S.U.'s IBM 370 computer printout using a P-STAT program.

The preceding figures suggest that 3M has been able to attract and retain a proportion of these human resources within the Brookings Community. The contribution that education makes to the standard of living can not be overlooked in an economic impact study, due to the substantially higher personal income associated with it.

TIME ENROUTE TO WORK BY RESIDENCE

For the sample data (158 respondents), the range for time enroute to work was 5 minutes to 45 minutes. The range, by place of residence, was 5 to 20 minutes for those living in the Brookings Community, 5 to 40 minutes for those living in Brookings County but not in the Brookings Community, and 15 to 45 minutes for those living outside Brookings County. The average time enroute for the entire sample was 12.2 minutes.⁵³ The data presented below gives the time enroute by place of residence for the 158 respondents: (All times were rounded to the nearest five minutes during compilation.)

Time:	5	10	15	20	25	30	35	40	45
Residence: Community	57	44	5	2					
County	1	6	9	15	1	3		1	
Out-of-County			1	3	1	4	1	2	2

At first glance, the category of 20 minutes enroute to work for respondents living in the community seems extreme. However, in light of current energy costs, the possibility of the respondents belonging to a car pool of some sort is feasible as is the possibility of a

⁵³/Ibid.

transportation schedule for a family, such as dropping off school age children or another working member of the family at a respective point of employment. The time enroute and place of residence figures also give an indication of the importance of the economic impact the 3M's locating in Brookings has had and/or is having, not only on the Brookings economy, but on the immediate regional economy as well. This can be interpreted as a benefit to the citizens of South Dakota.

EMPLOYMENT STATUS

As depicted below based on the sampling return, 10 percent of the 3M workforce engages in other part-time employment:

	Female	Male	%Female	%Male
Other part-time employment	7	30	3.6	17.6
No other part-time employment	185	139	96.4	82.4

Many of the female respondents indicated that they were working mothers and housewives. They are to be commended in this respect, in that they are preserving one of America's most cherished social institutions, that of the family unit, while at the same time contributing to the increased per capita income which is indicative of an ever-increasing standard of living. In addition, part-time employment (includes self-employment) noted was farming, appliance service, livestock feeder, National Guard, salesperson (home care products), welder, electrician, and apartment owner/manager.

Nationally known columnist and economist, Sylvia Porter, recently had this to say about people engaged in part-time employment:

. . . The millions of persons who hold two or more jobs

(moonlighters) will be the target of increasingly bitter criticism [during an economic slowdown]. This group now includes 4,300,000 Americans, the highest number ever and representing 5.1 percent of all employed workers. Moonlighters include both women and men, although four-fifths of all moonlighters are men...multiple job-holding spans all occupations. I can hear it ... now, for I've heard and read it often enough in the past. "Why should these men (or women) take jobs away from me (or my husband) when we need the paychecks so desperately?" "These people are job raiders! They are stealing work from people just as capable as ..."

The criticisms sound persuasive on the surface, but they are not valid. The theory that the moonlighter is a job raider is a myth. They are instead hard-working men and women with skills in sufficient demand to command secondary jobs, with responsibilities which propel them to work far beyond the norm and with ambitions that drive them.

[most jobless persons] .. do not have...the inclination or skills ...[or] lack stamina, after they finish their primary jobs, to devote virtually an additional full work-week to their own enterprises.

...An impressive number also are self-employed in their secondary occupations - testifying to their special skills and their ambitions.

...Before the myth of the moonlighter as job raider gains new, ugly strength, study the facts. Perhaps after a realistic appraisal, you'll view these men and women as I do, with respect not resentment.⁵⁴

Comparison with the national figure (10.1 percent vs. 5.1 percent) indicates that the 3M workforce possesses an extraordinarily high level of productivity, and reinforces the so-called "Protestant Work Ethic" associated with employees from rural towns and farms.

The survey indicated that three persons from the workforce were students. Unfortunately, this particular entity was not made explicit on the questionnaire, and therefore its importance and impact was understated. The 3M Company does have a program of sponsorship for

⁵⁴/Sylvia Porter, Minneapolis Tribune, Volume CVII, Number 252 S, January 31, 1974.

education, nonetheless, which when coupled with the observed education levels, suggests an outlet or market for graduates of the schools in the Brookings area.

A cross tabulation of sex by marital status revealed that 64 of the 84 female respondents were married. This indicates that 76 percent of the 192 women employed at 3M were adding to their husband's income or doing the not-so-unusual task of supporting a household while the male member attends school. Either way the impact is beneficial to the community in terms of higher per capita income and educating a member of society who may not otherwise have the opportunity to gain an education.

It may be interesting to note that a total of 44 of the 192 female employees lived on farms, or 22.9 percent based on a weighted average by place of residence. This accounts for 12.2 percent of the total workforce. The sample data is presented below:

	Females living on a farm	Percent	Females in work force	Estimated subtotal
Community	1 of 58	1.7	132	2
County	11 of 18	61.1	42	26
Out-of-County	7 of 8	87.5	18	16

Twenty-three or 13.7 percent of the males employed at 3M lived on a farm. This constituted 6.4 percent of the total workforce. The results based on questionnaire data are presented below:

	Males living on a farm	Percent	Males in work force	Estimated subtotal
Community	3 of 50	6.0	113	7
County	4 of 18	22.2	41	9
Out-of-County	3 of 6	50.0	14	7

This has important aspects for the family farm. The worker seeking off-farm employment must increasingly be willing to accept full-time, 8-hour-a-day employment as rural areas are industrialized with a leaning toward a less labor-intensive farm enterprise. This means that some farming operations are tending toward the part-time employment category. The ramification is that in some cases labor-intensive activities such as dairy, pork, beef, and poultry production are reduced or eliminated while the hiring of custom farm work such as crop harvesting, feeding services, fertilizer application, and hauling of commodities is increased.⁵⁵

The number of farm resident workers indicates that 3M has had a beneficial impact on the local economy's problem of underemployment. This means that people possessing the necessary skills who are willing to work have been given the opportunity to use their talents and have taken advantage of it. Furthermore, it is estimated that at least 31.9 percent of the labor force at 3M moved to Brookings as a result of that employment opportunity. (See Table IV-2, p. 54.) This, when combined with the undetermined number of employees who stayed here because of their job with

^{55/} John T. Scott, Jr. gives an intense treatment on this subject in an article entitled "Economic Impact of Industrialization on Traditional Rural Areas," American Society of Farm Managers and Rural Appraisers, Volume 32, October, 1968.

3M (see questionnaire comments, p. 74), indicates that South Dakota's outmigration problem may be abating.

ECONOMIC PROFILE SUMMARY

The impact that 3M's locating in Brookings has had on the community's outmigration problem has been positive and beneficial. Rural industrialization of this type tends to attract and retain South Dakota's human resources.

The economic profile of the 3M workforce revealed that industry in a rural setting has beneficial impacts on the problems of unemployment and underemployment, dispersed over a relatively large geographic area. For example, 32 percent of the employees commute from outside Brookings Community. Additionally, this indicates the degree of underemployment or part-time employment existing in South Dakota. The impact on the immediate community is likewise substantial and positive, with 68 percent of the 3M workforce residing in Brookings.

The data presented in this chapter were drawn from the workforce of one manufacturing plant, nevertheless, due to the size and relative newness of the industry to Brookings, inferences can be made about the labor force in general. While 3M's employment pattern has some concentrated profile characteristics, the wide spectrum of individual characteristics observed on the survey tended to give weight to the contention that 3M employees were representative of a cross section of the total available labor supply.

The 3M workforce, which includes a number of previously underemployed and possibly unemployed people, is the beneficiary of the

primary impact. The Brookings area merchants and property owners are receiving a portion of the secondary effects of the impact through the spending patterns of the 3M employees. The exact recipients are isolated and the dollars and cents benefits and costs are estimated in chapter four. The indication is clear that the locally available labor force was adequate to support the 3M industry without creating additional burdens in terms of labor supply on the community. Information of this type is vital as a measure of the extent to which the economy of a community can be feasibly expanded through induced industrialization.

CHAPTER IV

ANALYSIS OF THE IMPACT ON BROOKINGS COMMUNITY

INTRODUCTION

Chapter four presents the analysis of the economic impact that 3M has had and/or is having on the Brookings Community. A brief description and presentation of the analysis factors pertinent to the model is given under the subheadings of The 3M Workforce, The 3M Plant, and the Brookings Community. The source and computation for each factor mentioned can be found in the appropriate appendix. Tables IV-1 and IV-2 are given as a summary of the analysis factors. All computations are to be assumed to be for calendar year 1973, unless otherwise noted.

Following that will be the application of the analysis factors within respective segments of the model. These are presented in the following order: Private Sector Analysis, Municipal Government Sector Analysis, and the School District Sector Analysis. Each is put into tabular form at the conclusion of the respective descriptive section. Finally, a Total Community Analysis is presented followed by a tabular summary.

Table IV-1. Summary of Revenue and Expenditure Coefficients Utilized in the Respective Impact Analysis of the Municipal Government and School District Sectors of the Brookings Community.^a

REVENUE COEFFICIENTS:

Miscellaneous Municipal Revenues Per Capita ^b	\$47.45
School District Revenues Per Pupil ^c	\$23.43
Municipal Revenues Per Dollar of Income ^d	.142
School District Revenues Per Dollar of Income ^d	.0402
Municipal Shared Taxes Per Dollar of Income	.0029
Municipal Property Tax Mill Rate	16.17
School Property Tax Mill Rate	41.92
School State Aid Per ADM	\$102.43
School Federal Aid Per ADM	\$35.05
Municipal Public Enterprise Revenue Per Capita	\$368.81

EXPENDITURE COEFFICIENTS:

Municipal Expenditures Per Capita ^b	\$97.56
School District Expenditures Per Pupil ^c	\$32.74
Municipal Expenditures Per Dollar of Income ^d	.130
School District Expenditures Per Dollar of Income	.0407
Municipal Public Enterprise Expenditure Per Capita	\$314.79
Municipal Operating Expenditure Per Capita	\$88.01
Municipal Capital Expenditure Per Capita	\$9.55
School Operating Expenditure Per ADM	\$800.80
School Capital Expenditure Per ADM	\$93.21

^{a/}All calculations and sources for Table IV-1 are given in Appendix C, pp. 94-100.

^{b/}Does not include property taxes, state aids, shared taxes, or public enterprise revenues and expenditures.

^{c/}Does not include property taxes, or state and federal aids.

^{d/}Includes all sources of revenues and expenditures (property taxes and intergovernmental aids or transfers).

Table IV-2. Summary of Population and Investment Changes Induced by the Addition of Minnesota, Mining, & Manufacturing Co. to the Brookings Economy Plus the Residential and Propensity to Consume Locally Patterns of the 3M Workforce.*

PLANT:

New Plant Investment (taxable value)	
Real Estate	\$2,199,035.00
Personal Property (equipment)	610,540.00
Utilities (1973 billing)	
Water and Waste Water	8,467.57
Electricity	125,752.78
Average Annual Salary Paid	8,055.56
Average Salary Earned at Previous Job	5,120.00

WORKFORCE:

Number Employed at Plant	360
Employee Geographic Residence	
Brookings Community	245
Brookings County but not Brookings Community	83
Outside Brookings County	32
Propensity to Consume Locally by Geographic Residence	
Brookings Community	75.74%
Brookings County but not Brookings Community	38.06%
Outside Brookings County	34.07%
County Multiplier (secondary effects only)	.832

BROOKINGS COMMUNITY ADDITIONAL RESIDENTS:

Employees	115
School Age Children	50
Others Accompanying Employees	105
Total:	<u>270</u>
Additional Housing Units	
Conventional (\$32,091.00 average cost)	25
New Mobile Homes (\$8,750.00 average cost)	9
Transported Mobile Homes (\$3,000.00 average value)	2

* All calculations and sources for Table IV-2 are shown in Appendix D, pp. 101-107.

The 3M Workforce

The Medical Products Division of Minnesota Mining & Manufacturing Company, employed about 360⁵⁶ people at the Brookings, South Dakota site in December 1973. Based on the results of a questionnaire distributed to the employees at the plant, 245 of the workers live within the Brookings Community, 83 live in Brookings County but not in the Brookings Community, and 32 live outside Brookings County. The average annual salary at the new 3M plant is \$8,055.56. Two jobs previously held in the community were eliminated after the workers accepted employment with 3M. The average salary for jobs terminated was \$5,120.00

Of the 245 employees living in the Brookings Community, 115 are new residents, having moved to the community as a result of their employment with 3M. The 115 new employees brought with them an additional 155 persons including 50 children who were enrolled in the local school system.

Twenty-five of the 115 employees who moved to Brookings as a result of their employment with 3M built or bought newly constructed homes at an average price of \$32,091.00, nine purchased new mobile homes at an average price of \$8,750.00, and two moved mobile homes to Brookings

^{56/} Figure quoted by Allen H. Moun, Plant Manager, during a personal interview.

with an average value of \$3,000.00.⁵⁷

This additional property added to the tax base of the community and was a benefit. On conventional housing the taxable value was deflated by the taxable value of the lot which somebody was paying taxes on prior to the construction. According to Howard Klein, City Assessor, Brookings has a vacant urban lot taxing policy whereby 75 percent of the fair market value is exempted from taxation until a structure is placed on the lot. The estimated taxable value, on an average, for the average price quoted above, before construction was \$850.00. The resultant taxable value for purposes of this study for the new conventional housing was \$31,241.00 (\$32,091.00-\$850.00).

Dorothy Deen, Deputy Director of Equalization, Brookings County, gave the following account of the procedure used for taxation of mobile homes within the city limits.⁵⁸ The South Dakota (State) Department of Revenue distributes a depreciation table each year for mobile homes. Either the original purchase price or the current value of the mobile home can be used to enter the table by age. The depreciated value is then multiplied by the assessment percentage, which currently is 41

^{57/}The preceding figures are based on the results of the questionnaire. The impact on the school district is underestimated by the number of students who attend District 122, but live outside the community and moved to their current residence as a result of their parents' accepting employment with 3M. The survey also indicated that 36% of those families who moved to Brookings purchased existing homes and 32% rented.

^{58/}Information obtained during a telephone conversation March 1, 1974.

percent. The taxable value is then applied to the mill levy, currently 66.91, giving the dollar amount of tax revenue payable.

For purposes of this study the \$8,750.00 mobile homes were assumed to be two years old, on an average, while the \$3,000.00 valued mobile homes were assumed to be six years old. The tax on the \$8,750.00 mobile home for 1973 was \$201.60, and that for the \$3,000.00 mobile home was \$82.30 (computed by the Director of Equalization's Office).

The 3M Plant

The 3M Company's taxable investment in the Brookings Community consists of real estate (agricultural and nonagricultural) and personal property (equipment). The taxable value of the plant (real estate, nonagricultural) was \$2,199,035.00 with 1973 tax revenues of \$147,137.44. Taxable value of agricultural real estate was \$10,335.00 with 1973 tax revenues of \$559.24. Taxable value of personal property (equipment) was \$610,540.00 with 1973 tax revenues of \$40,851.24. The agricultural real estate tax of \$559.24 was not an additional benefit to the community as taxes had been collected on the land prior to purchase by 3M. However, the other two investments, the plant and equipment, were additions to the community's tax base, thereby being a benefit.

The City of Brookings did not incur any known expenses. The sewer expansion cost of approximately \$40,000.00 was borne privately by the 3M Company with minor funding from a HUD program. The annual water and waste water bill for 1973 for the plant was \$8,467.57, and for

electricity \$125,752.78.⁵⁹ In the analysis, the utility bills were treated as costs and benefits to the community under the assumption that the utility revenues were adequate to cover the full costs of producing and delivering the utilities.

The Brookings Community

Factors influencing 3M's economic impact on the Brookings Community include locally available labor, propensity to consume locally, and public fiscal structure. The workforce's propensity to consume locally (percent of total income derived from 3M spent in Brookings) varied from 75.74 percent for community residents, to 38.06 percent for county residents to 34.07 percent for noncounty residents. The county multiplier (secondary effects only) was estimated to be 0.832.

The city assessor is responsible for the implementation of a 66.91 mill levy for part of Brookings' revenue. Of this, 41.92 goes to the school district, 8.82 to the county, and 16.17 is retained for city funding (agricultural property is assessed at 54.11 mills). Property is assessed at 41.2 percent of its fair market value.

Other sources of municipal revenue are shared taxes, estimated at \$0.0029 per dollar of personal income, and what is known as Public Enterprises, which includes municipally operated utilities, liquor

⁵⁹/ Data supplied by Dorothy Bishman, Office manager, Municipal Utilities Department Office, during a personal interview February 13, 1974.

store, hospital, airport, parks, and refuse collection. For 1973, the average per capita expenditure for public enterprises was \$314.79. Per capita municipal revenue, excluding property taxes, shared taxes, and public enterprises, was \$47.45. The per capita municipal operating and capital expenditures, excluding public enterprises, were \$88.01 and \$9.55, respectively. Municipal revenues and expenditures per dollar of personal income for 1973 were estimated at \$0.142 and \$0.130, respectively.

As stated previously, the property tax levy for Brookings Independent School District Number 122, is 41.92 mills. The average per daily membership (ADM) school aid was \$102.43 from state sources and \$35.05 from federal sources. School operating expenditures were \$800.80 per ADM, and the estimated capital expenditures average \$93.21 per ADM. The estimated school revenues and expenditures per dollar of income were \$0.0402 and \$0.0407, respectively.

BROOKINGS PRIVATE SECTOR'S IMPACT ANALYSIS

The new income (3M payroll) remaining in the Brookings Community (internalized income) was determined by weighting the plant payroll by the employees place of residence and propensity to consume locally. Equations (1) through (4) show the calculation of primary internalized income:

(1)	Number of employees by place of residence	Average x annual income	x	Propensity to consume locally by place of residence	=	Internalized primary income
(2)	245	x\$8055.56	x	.7574	=	\$1,494,813.88
(3)	83	x 8055.56	x	.3806	=	254,473.53
(4)	32	x 8055.56	x	.3407	=	<u>87,824.94</u>

Total primary internalized income \$1,837,112.35

Of the plant's \$2,900,000.00 payroll, \$1,837,112.35, or 63.35 percent, was spent in the community. The importance of a locally available labor force may be noted at this point. If all the employees had resided in the community, the internalized primary income would have been \$2,196,460.00, a difference of \$359,347.65.

Equations (5) and (6) calculate the internalized secondary income impact of the 3M plant. It is assumed that the recipients of secondary income reside in the community and exhibit the same propensity to consume locally as do the employees at the plant who live in the Brookings Community:

(5)	Internalized primary income	x	Brookings County income multiplier	x	Propensity to consume locally	=	Internalized secondary income
(6)	\$1,837,112.35	x	.832	x	.7574	=	\$1,157,668.84

The \$1,157,668.84 represents the change in the income of community residents not working at 3M that was spent in the community. The total induced income change in the Brookings private sector was \$2,994,781.19 (internalized primary income plus secondary income).

The private sector opportunity cost of the 3M plant was the primary and secondary income loss because of the 57 jobs terminated in the community by residents of the community to accept employment with 3M, two were eliminated, while 55 were refilled. The calculation of income loss from the two previous jobs not refilled is similar to the calculation of internalized plant payroll. The 55 jobs refilled were assumed to be taken by community residents.⁶⁰ The loss of internalized primary income is computed in equation (8):

(7)	Number of workers by place of residence	x	Average annual income from previous job	x	Propensity to consume locally by place of residence	=	Internalized previous income lost	
(8)	2	x	\$5,120.00	x	.7574	=	<u>\$7,755.78</u>	
	Total primary income lost							\$7,755.78

The loss of primary income affects the volume of trade in the community and this loss of secondary income was estimated by equation (10):

(9)	Internalized primary income lost	x	Brookings County income multiplier	x	Propensity to consume locally	=	Secondary income loss
(10)	\$7,755.78	x	.832	x	.7574	=	\$4,887.36

⁶⁰ Of the 108 residents of Brookings Community responding to the questionnaire, 25, or 23 percent, had terminated a job previously held in the community. 23 percent of 245 equals 57, or the estimated number of employees from the total workforce who reside in Brookings and terminated previous community employment to accept a job with 3M. Of 36 respondents who lived outside Brookings Community, but in Brookings County, 13 had terminated a job in Brookings. Of the 14 respondents who lived outside Brookings County, one had terminated a job in Brookings. In both cases, however, the previously held jobs were refilled and not eliminated.

The estimated loss of previous income in the community (private sector opportunity costs) was \$12,643.14 (internalized primary income plus secondary income).

The primary and secondary benefits and costs were combined to give total benefits and costs to the private sector. The net gains in the private sector are given by the difference between total benefits and costs in the private sector. Table IV-3 is a summary of the economic impact that 3M had and/or is having on Brookings Community's private sector.

Table IV-3. Net Gains to Brookings Community's Private Sector.

BENEFITS:

3M Plant Wages and Salaries
Internalized in Brookings \$1,837,112.35

Total Primary Benefits \$1,837,112.35

Internalized Secondary
Income \$1,157,668.84

Total Secondary Benefits \$1,157,668.84

Total Benefits \$2,994,781.19

COSTS:

Internalized Income from
Previous Jobs Not Refilled
in Brookings Community \$ 7,755.78

Total Primary Costs \$ 7,755.78

Internalized Secondary
Income From Previous
Jobs Not Refilled \$ 4,887.36

Total Secondary Costs \$ 4,887.36

Total Costs \$ 12,643.14

NET GAIN TO PRIVATE SECTOR:

Total Benefits - Total Costs \$2,982,138.05

BROOKINGS MUNICIPAL GOVERNMENT SECTOR'S IMPACT ANALYSIS

Changes in population, income, and property values are the means by which new industry affects the municipal government sector. Of the 115 employees who moved to Brookings as a result of their employment with 3M, 25 built or bought newly constructed conventional homes at an average price of \$32,091.00, nine purchased new mobile homes at an average price of \$8,750.00, and two moved mobile homes to Brookings with an average value of \$3,000.00, thus adding to the community's property base. The municipal property tax levy is 16.17 mills at 41.2 percent assessment of fair market value, yielding \$5,681.48 in municipal property tax revenues from the new residents.⁶¹ The assessed (taxable) value for 3M's plant, equipment, and agricultural property is \$2,199,035.00, \$610,540.00 and \$10,335.00, respectively, yielding \$45,430.83 to the city's property tax revenues.⁶² As previously stated, utility revenues were assumed to be adequate to cover the operating costs of producing and delivering the utilities. The utility impact for the 3M plant was \$134,220.35. For the 270 additional residents, the public enterprise expenditures were estimated at \$84,993.30 (270 x \$314.79) and revenue was an estimated \$99,578.70 (270 x \$368.81). The nonutility and non-property tax municipal government revenues and expenditures were

⁶¹/Computation of the municipal revenues were as follows: \$31,241.00 (see page 56) times 25 at 16.17 per \$1000.00 of assessed value (41.2%) yielding \$5203.22. For the mobile homes (see page 56) 24.2 percent of the taxes collected go to the city. Therefore, 24.2 percent of [(9 x \$201.60) + (2 x 82.30)] yields \$473.26 for a total of \$5,681.48.

⁶² / (\$16.17 per \$1000) (\$2,809,575.00) = \$45,430.83.

determined by the number of new residents in the community times the respective per capita coefficient (see Table IV-1, page 53). Equations (11) through (14) show the computations:

$$(11) \quad \text{New Population} \times \text{Per Capita Revenue Coefficient} = \text{Primary Municipal Impact} \\ \text{(excluding utilities, shared revenue and property taxes)}$$

$$(12) \quad 270 \quad \times \quad \$47.45 \quad = \quad \$12,811.50$$

$$(13) \quad \text{New Population} \times \text{Per Capita Expenditure Coefficient} = \text{Primary Municipal Impact} \\ \text{(current and capital excluding utilities)}$$

$$(14) \quad 270 \quad \times \quad \$97.56 \quad = \quad \$26,341.20$$

Shared revenue for the Brookings Community was .0029 per dollar of personal income. The estimated additional municipal government revenue generated by new income in the community (net gain to the municipal sector) is given by equation (16):

$$(15) \quad \begin{array}{l} \text{New Income In} \\ \text{Brookings} \end{array} \times \begin{array}{l} \text{Shared Revenue} \\ \text{Ratio} \end{array} = \begin{array}{l} \text{Shared Revenue For} \\ \text{Municipality} \end{array}$$

$$(16) \quad \$2,982,138.05 \quad \times \quad .0029 \quad = \quad \$8,648.20$$

The 115 employees who reside outside the city limits and commute into Brookings to work at 3M created municipal service costs. The commuters received the use of selected municipal services while they were in the city limits. The costs of commuters were computed as weighted per capita nonutility municipal expenditures. The weight⁶²

^{62/}Based on 2,500 hours per year per commuter divided by an 8,760 hour year yielding a coefficient of .2854.

is the percentage of time spent in the community per year by the employee assuming he spends 10 hours per day, five days a week for 50 weeks per year. Equation (18) shows the computation of the municipal government's costs for new commuters:⁶³

(17)	Number of New Commuter Employees	x	Per Capita Expenditures	x	Weight For Time Spent In Brookings	=	Cost Of Additional Commuters
(18)	51	x	\$97.56	x	.2854	=	\$1,420.03

Secondary public sector effects were induced by 3M's locating in Brookings similar to those occurring in the private sector. The secondary public sector effects are related to the secondary income changes induced by 3M's internalized primary payroll income. Equations (19) through (22) show the calculation of the secondary municipal fiscal impact:

(19)	Internalized ⁶⁴ Secondary Income	x	Municipal Fiscal Revenue Coefficient per Dollar of Income	=	Secondary Municipal Impact
(20)	\$1,152,781.48	x	.142	=	\$163,694.97
(21)	Internalized Secondary Income	x	Municipal Fiscal Expenditure Coefficient per Dollar of Income	=	Secondary Municipal Impact
(22)	\$1,152,781.48	x	.130	=	\$149,861.59

^{63/} Based on questionnaire data, 44 percent of the workforce living outside Brookings Community are new commuters (22 of 50 respondents. The other 28 respondents had commuted to Brookings for other jobs held prior to employment with 3M), .44 times 115 = 51.

^{64/} \$1,152,781.48 = \$1,157,668.84 - \$4,887.36 (internalized secondary income - internalized secondary income lost from previous jobs not refilled).

The primary and secondary benefits and costs were summed to determine total benefits and costs to Brookings' municipal government sector. Net gains to the city's government sector were determined by the difference in total benefits and costs. Table IV-4 summarizes the economic impact that 3M had and/or is having on the municipal government sector of Brookings.

Table IV-4. Net Gains to Brookings Community's Municipal Government Sector.

BENEFITS:

Property Taxes, New Homes	\$ 5,681.48	
Property Taxes, 3M Facilities	\$ 45,430.83	
Utility Revenue, 3M	\$134,220.35	
Public Enterprise	\$ 99,578.70	
Miscellaneous Revenue	\$ 7,970.40	
		<i>292,879</i>
Total Primary Benefits		\$297,722.86
Shared Revenue	\$ 8,648.20	
Secondary Municipal Revenue Impact	\$163,694.97	
		<i>465,222</i>
Total Secondary Benefits		\$172,343.17
Total Benefits		\$470,066.03

COSTS:

Utilities, 3M Plant	\$134,220.35	
Public Enterprise	\$ 84,993.30	
Current Expenditures	\$ 26,341.20	
Capital Expenditures	\$ 1,420.03	
Total Primary Costs		\$246,974.88
Secondary Municipal Expenditures	\$149,861.59	
Total Secondary Costs		\$149,861.59
Total Costs		\$396,836.47

NET GAIN, MUNICIPAL GOVERNMENT:

Total Benefits - Total Costs *69,386*
\$ 73,229.56

BROOKINGS INDEPENDENT SCHOOL DISTRICT IMPACT ANALYSIS

Investments by 3M and new resident employees, accompanied by changes in school enrollment were the means by which 3M's impact was transmitted to Brookings Independent School District Number 122. The additional school district property tax revenue induced by the above investments are calculated by equation (24):

(23)	Assessment Value of 3M	x	Mill Levy =	School Property Tax Revenue
(24)	\$2,809,575.00	x	41.92 =	\$117,777.38
(25)	Taxable Investment by New Residents (conventional housing)	x	Assessment Ratio x Levy =	Mill School Property Tax Revenue
(26)	\$781,025.00	x	.412 x 41.92 =	\$13,489.11
(27)	Tax Revenue From Mobile Homes	x	Percentage Marked For School Revenue =	School Property Tax Revenue
(28)	\$1979.00	x	62.65 =	\$1239.84

Changes in ADM (average daily membership) affect school revenues from intergovernmental sources. Equations (30) and (31) calculate the changes in revenues from state and federal government aid:

(29)	New Students	x	Financial Coefficient per ADM	=	Intergovernmental Aid
(30)	50	x	\$102.43 (state)	=	\$5,121.50
(31)	50	x	\$ 35.05 (federal)	=	\$1,752.50

Primary capital and operating expenditures for the school system were influenced by changes in enrollment which were a direct result of 3M's locating in Brookings. Equations (32) through (34) calculate operating and capital expenditures for the new students:

$$(32) \quad \text{New Students} \times \begin{array}{c} \text{Expenditure Coefficient} \\ \text{per ADM} \end{array} = \begin{array}{c} \text{School Primary} \\ \text{Expenditures} \end{array}$$

$$(33) \quad 50 \quad \times \quad \$800.80 \text{ (operating)} = \$40,040.00$$

$$(34) \quad 50 \quad \times \quad \$ 93.21 \text{ (capital)} = \$ 4,660.50$$

By locating in Brookings, 3M induced both primary and secondary changes in the school district fiscal resources. The secondary fiscal effects are a function of secondary income in the private sector. Secondary revenue and expenditure effects are calculated by equations (35) through (37):

$$(35) \quad \begin{array}{c} \text{Secondary} \\ \text{Income} \end{array} \times \begin{array}{c} \text{School Fiscal Coefficient} \\ \text{per Dollar of Income} \end{array} = \begin{array}{c} \text{School Secondary} \\ \text{Fiscal Impact} \end{array}$$

$$(36) \quad \$1,157,668.84 \times .0402 \text{ (revenue)} = \$46,538.29$$

$$(37) \quad \$1,157,668.84 \times .0407 \text{ (expenditure)} = \$47,117.12$$

The primary and secondary benefits and costs were summed to determine total benefits and costs to Brookings Independent School District Number 122. Net gains to the school district were determined by the difference in total benefits and costs. Table IV-5 summarizes the economic impact that 3M had and/or is having on the local school district.

Table IV-5. Net Gains to Brookings' Independent School District.

BENEFITS:

Property Taxes, New Homes	\$ 14,728.95	
Property Taxes, 3M	\$117,777.38	
State Aid	\$ 5,121.50	
Federal Aid	\$ 1,752.50	
Total Primary Benefits		\$139,380.33
Secondary Revenue	\$ 46,538.29	
Total Secondary Benefits		\$ 46,538.29
Total Benefits		\$185,918.62

COSTS:

Capital Expenditure, New Students	\$ 4,660.50	
Operating Expenditure, New Students	\$ 40,040.00	
Total Primary Costs		\$ 44,700.50
Secondary Costs	\$ 47,117.12	
Total Secondary Costs		\$ 47,117.12
Total Costs		\$ 91,817.62

NET GAIN TO BROOKINGS SCHOOL DISTRICT:

Total Benefits - Total Costs		\$ 94,101.00
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TOTAL BROOKINGS COMMUNITY ANALYSIS

The estimated net economic impact that 3M had and/or is having on the Brookings Community was determined by summing the net impact on each of the three community sectors. The estimated average annual net impact on the private sector was \$2,982,138.05, \$73,229.56 on the municipal government sector, and \$94,101.00 on the school district sector, for an estimated total community net gain of \$3,149,468.61. Table IV-6 summarizes the total net gain.

Table IV-6. Net Gains to the Brookings Community.

Net Gain to Private Sector	\$2,982,138.05
Net Gain to Municipal Government Sector	73,229.56
Net Gain to School District Sector	94,101.00
Total Net Gain to Brookings Community	\$3,149,468.61

that is willing and able to contribute positively to the Brookings economy, given the opportunity for employment.

The 3M employment pattern also had positive impact effects on the problems of unemployment and outmigration. It was found that 47 percent of the workforce who now live in the Brookings Community moved to Brookings to accept employment with 3M, supporting the contention that most workers would rather move to accept employment than go unemployed. The study further revealed that 23 percent of the female workforce lived on farms, and that 53 percent of the total workforce was female, with 55 percent of the female workforce falling into the 20-24 age group. This data is indicative of hiring practices for this particular type of industry, the stemming of outmigration from South Dakota, and the general availability of labor. South Dakota has had, in the recent past, a problem of outmigration, and the Brookings Community was no exception. In addition to the aggregate findings, the following excerpts, taken from the comment section of the questionnaire, support the conclusion that 3M was instrumental in helping to stem the outflow of human capital:

. . . I first became a resident of Brookings while attending SDSU. After graduation I was employed out of state before accepting a position with 3M and returning to Brookings.

. . . A Great Place (sic) to work, and if it were not for 3M in Brookings I would have moved my family out of state to find a decent paying job. I had only been back . . . [military service] . . . one year and a half and it didn't take long to see there were very few jobs available that a man could work at and support his family without his wife working too. 3M kept me here.

South Dakota's investment in higher education is likewise realizing a higher rate of return by the reversal of outmigration.

POLICY IMPLICATIONS

The positive impact experienced by the Brookings Community due to 3M's locating in Brookings strongly supports a general recommendation of rural industrialization. Additional and/or follow-up studies to the one conducted by the Fantus Company⁶⁵ in 1968 on the potential for industrialization for South Dakota, and implementation of a prudent plan of action would seem in order to ensure the citizens of South Dakota an increased share of the abundance in America. Studies such as the one conducted by Fantus give an indication of what industries to attract to South Dakota Communities to contribute to the state's standard of living.

LIMITATIONS OF THE STUDY

Many studies are hampered by the question of whether data received is representative of the population. This problem was, for the most part, eliminated by the high rate of return (45.5 percent, $164 \div 360 \times 100$), and the high rate of usable returned questionnaires (43.8 percent, $158 \div 360 \times 100$), in this study. The conclusions have their foundation on the validity of the data collected, and it is recognized that some of the data was human estimation, and further influenced by rounding in some cases.

Sociological topics including crime control, pollution, education, transportation, savings, taxes, traffic control, and housing,

⁶⁵/Fantus Company, An Industrial Development Action Program for the State of South Dakota - Phase I, (New York: The Fantus Company, 1968).

among others, have not been pursued by this study. These are subjects of high importance which, unfortunately, are not within the constraints of time and funding of this project.

Another limitation is in the inherent assumptions of the model. Therefore, the solutions presented are not intended as absolute determinants, but as quantifying estimates, understandable to the professional mathematician and layman alike in dollar and cents terms, to be used as a tool for decision making concerning industrialization of rural areas.

RECOMMENDATIONS FOR FURTHER RESEARCH

The subject of propensity to consume locally could use additional research to ascertain the magnitude of each factor contributing to the aggregate leakage from the Brookings economy. Corrective action based on this knowledge could conceivably increase the propensity to consume locally.

Perhaps a more important area that needs research is that of marginal costs incurred by cities due to incoming new industry as contrasted with average costs which are used primarily by smaller cities as planning and expansion aids.

Further study should be conducted in the area of wage rates. This does not imply that 3M is a low-wage industry,⁶⁶ however, it should be pointed out that sometimes low-wage industries are unjustifiably considered to be undesirable. For instance, if there is a need to

⁶⁶/The evidence is to the contrary, relative to the Brookings economy, in that the average annual salary prior to employment with 3M was \$5,120.00 compared to a current average salary of \$8,055.56.

employ relatively untrained and part-time workers, then a relatively low-wage industry may be the best alternative; therefore, the wage level is a relative matter, dependent on available alternatives.

No doubt questions will arise concerning public service to all strata. It is advisable that further research be conducted in the areas of crime control, education, transportation, and public utilities so that private and intergovernmental implications can be discovered with resulting predictions on enrollment, birth rate, parking lots, housing for the elderly, sewer expansion, rural zoning, road construction, parks, and a host of other potential resource management problems. This is especially true if Brookings sustains its high rate of growth.

The people of the Brookings Community have a tremendous opportunity to progress in size and economic development to a socially desirable level without committing the mistakes of induced higher per capita costs for crime prevention, pollution, traffic congestion and other problems associated with unplanned and poorly supervised metropolitan growth. It is hoped that research and acquired knowledge on the subjects touched by this study will and can contribute to that socially desirable level of growth.

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APPENDIXES

APPENDIX A
QUESTIONNAIRE

Employee Description and Prior Employment

- 1) Your age is _____
- 2) Your sex () female () male
- 3) Marital status
 () single () separated
 () married () widowed
 () divorced
- 4) Circle highest year of education completed
- | | | | |
|----------|----------|---------|-----|
| grade | high | college | 13 |
| school 1 | school 9 | | 14 |
| 2 | 10 | | 15 |
| 3 | 11 | | 16 |
| 4 | 12 | | 16+ |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
- 5) Did you terminate a job in the Brookings Community (includes the surrounding rural area within two miles of the city limits) to accept a position with 3M?
 () yes () no
 a) If yes, what was your annual gross income from the previous job? _____
 b) If you answered yes to question number 5, to the best of your knowledge the job you vacated was
 () refilled () eliminated
- 6) Did you move to the Brookings Community as a result of your employment with 3M?
 () yes () no
 a) If yes, how many residents including yourself, accompanied you? _____
 b) Of this total, how many were of school age (Kindergarten through grade 12)? _____
- 7) When did you accept employment with 3M?
 (month) _____ (year) _____
- 8) Are you actively engaged in employment or an occupation in addition to your employment with 3M?
 () yes () no
 If yes, state briefly your other occupation(s): _____

Housing

- 9) Your place of residence is _____
- _____ in the Brookings Community (including the surrounding rural area within 2 miles of the city limits)
- _____ in Brookings County but not the Brookings Community
- _____ outside Brookings County
- 10) Your average time enroute to work is _____ minutes
- 11) Your place of residence is _____
- _____ on a farm
- _____ in a rural area, but not a farm
- _____ in a town under 2,000 population
- _____ in an urban area from 2,000 to 5,000 population
- _____ in an urban area from 5,000 to 10,000 population
- _____ in an urban area from 10,000 to 25,000 population
- _____ in an urban area from 25,000 or more population
- 12) Were you a resident of Brookings prior to employment with 3M?
- () yes () no
- a) If yes, did you
- _____ own your home
- _____ own a mobile home
- _____ rent your home
- _____ rent a mobile home
- _____ rent an apartment
- b) If you were a resident of Brookings prior to employment with 3M, have you, as a result of that employment built or bought a newly constructed home, including mobile homes?
- () yes () no
- c) If yes, what was the price range (estimate to the nearest \$1,000)\$ _____
- 13) Did you move to the Brookings Community as a result of your employment with 3M?
- () yes () no
- a) If yes, did you
- _____ build or buy a newly constructed home
- _____ buy an existing home
- _____ move a mobile home to Brookings
- _____ buy a new mobile home
- _____ rent an apartment, home, or mobile home

- b) If you answered yes to question 13 and built or bought a newly constructed home, mobile home, or moved a mobile home to Brookings, what was the price range (estimate to the nearest \$1,000) \$ _____

Geographic Spending Pattern

- 14) Estimate the percentage of your 3M annual gross income (excluding all forms of saving or investment) that is spent
- _____ in the Brookings Community
 _____ in Brookings County but not in the Brookings Community
 _____ outside Brookings County
- 15) Estimate the percentage of your other annual gross income (excluding all forms of saving or investment) that is spent
- _____ in the Brookings Community
 _____ in Brookings County but not in the Brookings Community
 _____ outside Brookings County

APPENDIX B

APPENDIX B
SELECTED COMPUTATIONS FOR CHAPTER III

SELECTED COMPUTATIONS FOR CHAPTER III

SEX BY RESIDENCE

From the sampling data a total of 84 respondents were female and a total of 74 were male, giving the female-male percentages of 53.2 and 46.8 respectively ($84 \div 158 \times 100$ and $74 \div 158 \times 100$).

Of the 108 respondents, who lived in Brookings Community, 58 were female and 50 male, giving the male-female percentages of 53.9 and 46.0 respectively ($58 \div 108 \times 100$ and $50 \div 108 \times 100$). For those respondents who lived in Brookings County but not Brookings Community, 18 were female, and 18 male giving a 50 percent figure for each sex ($18 \div 36 \times 100$). Respondents who lived outside Brookings County were 57 percent female, and 43 percent male ($8 \div 14 \times 100$ and $6 \div 14 \times 100$), respectively.

AGE STRUCTURE

The sampling data presented below was used to calculate the figures for the entire workforce on page 43, by percentage of the workforce.

AGE DISTRIBUTION

	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	Row Total
Female	5	46	13	6	7	5	0	2	0	0	84
Male	0	12	18	11	9	7	6	4	6	1	74
PERCENTAGE BY SEX											
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	Row Total
Female	6.0	54.8	15.5	7.1	8.3	6.0	0	2.4	0	0	100
Male	0	16.2	24.3	14.9	12.2	9.5	8.1	5.4	8.1	1.4	100
PERCENTAGE OF TOTAL WORKFORCE BY SEX											
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	Row Total
Female	3.2	29.1	8.2	3.8	4.4	3.2	0	1.3	0	0	100
Male	0	7.6	11.4	7.0	5.7	4.4	3.8	2.5	3.8	0.6	100

The Age Distribution was taken from the questionnaire. The Percentage By Sex tabulation was calculated by dividing the number falling into an age grouping category by the total number for that sex. For example, five female respondents were in the 15-19 age grouping, $5 \div 84 \times 100 = 6$ percent, shown in the Percentage By Sex tabulation. The Percentage of Total Workforce By Sex was derived at by dividing the cell count for each age grouping by the total number of respondents.

For example, 13 female respondents were in the 25-29 age grouping,

$13 \div 158 \times 100 = 8.2$ percent.

APPENDIX C

SELECTED TABLE IV-1
REVENUE AND EXPENDITURE
COEFFICIENT COMPUTATIONS

REVENUE COEFFICIENTS⁶⁷Miscellaneous Municipal Revenues Per Capita⁶⁸

$$\frac{\text{Revenues}}{\text{Population}}$$

$$\frac{\$741,134.59}{15,620} = \$47.45$$

School District Revenues Per Pupil⁶⁹

$$\frac{\text{Revenues}}{\text{ADM}}$$

$$\frac{\$64,479.00}{2,751.57} = \$23.43$$

^{67/}All municipal revenue and expenditure figures were obtained from the files of the city auditor, Boyce Smith, during a personal interview February 14, 1974.

^{68/}The estimated 1973 urban Brookings population is based on the 1985 projection by the Upper Midwest Council and prorated at 440/year increase, using 1970 Census data.

^{69/}All Brookings Independent School District revenue, expenditure, and enrollment figures were obtained from the Adopted Budget 73-74, pp. 15-20, and/or the annual report to Pierre, as given by Charles Webbenhurst, Assistant Superintendent, during a personal interview February 13, 1974.

Municipal Revenues Per Dollar of Income⁷⁰

Revenues
Personal Income for the Jurisdiction

$$\frac{\$7,504,173.76}{\$52,920,560.00} = .142$$

School District Revenues Per Dollar of Income

Revenues (including special education)
Personal Income

$$\frac{\$2,132,655.86}{\$52,920,560.00} = .0402$$

^{70/}Estimated 1973 personal income for South Dakota is \$2,735,000,000.00 from Survey of Current Business, January 1974, Vol. 54, Number 1, United States Department of Commerce, Social and Economic Statistics Administration, Bureau of Economic Analysis, p. 29, (the fourth quarter was estimated using the average of the first three quarters). The estimated population of South Dakota for 1973 is based on the 1975 projection from the Upper Midwest Council and prorated at 1,497/year increase, using 1970 census data as a base. The estimated per capita income for South Dakota for 1973 is \$4,082.00 (estimated personal income divided by the estimated population). Using 1970 census data the per capita income for the city of Brookings was \$2,528.00 in 1969, and the state per capita income for South Dakota was \$3,051.00, South Dakota Business Review, Vol. XXXI, No. 1, August, 1972, p. 3 and Survey of Current Business, April 1970, Vol. 50, No. 4, p. 14, respectively. Using this ratio, (83%) the estimated per capita income for Brookings for 1973 is \$3,388.00. Personal income for urban Brookings is then estimated at \$52,920,560.00 (estimated population times estimated per capita income).

Municipal Shared Taxes Per Dollar of Income⁷¹

$$\frac{\text{Shared Taxes}}{\text{Personal Income}} = \frac{\$151,466.74}{\$52,920,560.00} = .0029$$

School State Aid Per ADM

$$\frac{\text{State Sources}}{\text{ADM}} = \frac{\$281,840.00}{2,751.57} = \$102.43$$

School Federal Aid Per ADM

$$\frac{\text{Federal Sources}}{\text{ADM}} = \frac{\$96,428.86}{2,751.57} = \$35.05$$

Municipal Public Enterprise Revenue Per Capita

$$\frac{\text{Revenues}}{\text{Population}} = \frac{\$5,760,786.67}{15,620} = \$368.81$$

⁷¹/Federal funds are obtained from agencies or programs such as LEEP (Law Enforcement Education Program), BOR (Bureau of Outdoor Recreation), and the FAA (Federal Aviation Agency).

EXPENDITURE COEFFICIENTS

Municipal Expenditures Per Capita

$$\frac{\text{Expenditures}}{\text{Population}}$$

$$\frac{\$1,523,912.20}{15,620} = \$97.56$$

School District Expenditures Per Pupil

$$\frac{\text{Expenditures}}{\text{ADM}}$$

$$\frac{\$90,109.14}{2,751.57} = \$32.74$$

Municipal Expenditures Per Dollar of Income

$$\frac{\text{Expenditures}}{\text{Personal Income}}$$

$$\frac{\$6,901,759.76}{\$52,920,560.00} = .130$$

School District Expenditures Per Dollar of Income

$$\frac{\text{Expenditures (including special education)}}{\text{Personal Income}}$$

$$\frac{\$2,158,286.00}{\$52,920,560.00} = .0407$$

Municipal Public Enterprise Expenditure Per Capita

$$\frac{\text{Expenditures}}{\text{Population}}$$

$$\frac{\$4,917,005.07}{15,620} = \$314.79$$

Municipal Operating Expenditure Per Capita

$$\frac{\text{Expenditures (excluding public enterprises)}}{\text{Population}}$$

$$\frac{\$1,374,691.62}{15,620} = \$88.01$$

Municipal Capital Expenditure Per Capita

$$\frac{\text{Expenditures (excluding public enterprises)}}{\text{Population}}$$

$$\frac{\$149,220.58}{15,620} = \$9.55$$

School Operating Expenditure Per ADM

$$\frac{\text{Expenditures (including special education)}}{\text{ADM}}$$

$$\frac{\$2,203,456.00}{2,751.57} = \$800.80$$

School Capital Expenditure Per ADM⁷¹

Expenditures
ADM

$$\frac{\$256,480.15}{2,751.57} = \$93.21$$

⁷¹/The maximum levy for capital outlay is 5.0 mills by law. The historic expenditure pattern for the Brookings Independent School District is 4.95 mills, according to Charles Webbenhurst, Assistant Superintendent. The 1973 taxable evaluation for the school district is \$51,814,172.00, as quoted by Al Schultz, Brookings County Auditor, during a telephone conversation on February 27, 1974. Thus the capital outlay revenue was computed (4.95) (\$51,814,172.00). The capital outlay revenue is not necessarily spent in any one year, but in the long run, is expended.

APPENDIX D

SELECTED TABLE IV-2
ANALYSIS FACTOR COMPUTATIONS

THE 3M COMPANY PLANT AND PAYROLL ANALYSIS FACTORS

The taxable values of the 3M plant and equipment and 1973 taxes were obtained from the files of the city assessor. Utility billings were obtained from the files of the Brookings Utilities office manager. The \$2,900,000.00 payroll and the number of employees was obtained during a personal interview with the 3M Plant Manager. The average annual previous salary for jobs terminated and subsequently eliminated to accept employment with 3M was calculated using data obtained from the questionnaire.

NEW RESIDENT EMPLOYEES

Of the 108 respondents who lived in the Brookings Community, 51 were new residents. This indicates that 47 percent $(\frac{51}{108} \times 100)$ of the workforce living in the Brookings Community were new residents. Of the 158 respondents, 108 lived in Brookings, or 68 percent $(\frac{108}{158} \times 100)$. $.68 \times 360$ (the total workforce) = 245. 47 percent of 245 = 115 new resident employees.

TOTAL NEW RESIDENTS

From the questionnaire, it was concluded that a total of 120 new residents (including the 51 new employees) moved to Brookings. This yielded a ratio of 2.35 new residents per new worker $(\frac{120}{51})$. Multiplying this factor times the estimated total number of new employees, 115, yielded a total of 270 new residents.

NUMBER OF NEW SCHOOL AGE CHILDREN

Twenty-two school age children accompanied the 51 respondents who were new residents of the community, giving a ratio of .43 school age children per new worker $(\frac{22}{51})$. The total number of new school age children was determined by multiplying .43 times 115 (total number of new resident employees), giving an impact of 50 school age children.

AVERAGE PRICE OF TAXABLE NEW RESIDENT HOUSING

Of the 51 new resident employees, 11 bought newly constructed homes, four purchased new mobile homes, and one moved a mobile home into the Brookings Community. Following is the computation of the average prices and values, with data taken from the questionnaire.

New Conventional Housing

<u>Number of Buyers</u>	<u>Price</u>	<u>Dollars Spent</u>
1	\$42,000.00	\$42,000.00
1	40,000.00	40,000.00
1	37,000.00	37,000.00
1	35,000.00	35,000.00
1	34,000.00	34,000.00
2	30,000.00	60,000.00
1	29,000.00	29,000.00
1	26,000.00	26,000.00
<u>2</u>	25,000.00	<u>50,000.00</u>
Totals 11		\$353,000.00

Average price: \$32,091.00 ($\frac{\$353,000.00}{11}$)

The percentage of new residents buying new homes was 22 ($\frac{11}{51} \times 100$). The total number of new homes purchased by new resident employees was estimated at 25 ($.22 \times 115$).

New Mobile Homes

<u>Number of Buyers</u>	<u>Price</u>	<u>Dollars Spent</u>
1	\$12,000.00	\$12,000.00
2	8,000.00	16,000.00
<u>1</u>	7,000.00	<u>7,000.00</u>
Totals 4		\$35,000.00

Average price: \$8,750.00 ($\frac{\$35,000.00}{4}$)

The percentage of new residents buying new mobile homes was 8 percent ($\frac{4}{51} \times 100$). The total number of new mobile homes purchased by new resident employees was estimated to be 9 ($.08 \times 115$).

Transported Mobile Homes

<u>Number Moved</u>	<u>Value</u>	<u>Total Value</u>
<u>1</u>	\$3,000.00	<u>\$3,000.00</u>
Totals: 1		\$3,000.00

$$\frac{\text{Transported Homes}}{\text{New Employees}} = \frac{1}{51} = .02$$

(.02) (115) = 2 (total for new resident employees).

PROPENSITY TO CONSUME LOCALLY BY PLACE OF RESIDENCE

The following data were taken from the usable 158 questionnaire returns, and grouped by place of residence; Brookings Community, Brookings County but not Brookings Community, and Outside Brookings County. Percentage of income spent, in all cases, means that percentage of income derived from 3M that was spent in Brookings Community.

Brookings Community Residence

<u>Percentage Spent</u>	<u>Frequency</u>	<u>Weighted Index Per Category</u>
0	3	0
10	1	10
15	1	15
25	1	25
30	1	30
40	2	80
45	1	45
50	7	350
60	7	420
65	1	65
70	6	420
75	16	1,200

79	1	79
80	11	880
85	6	510
90	19	1,710
93	1	93
95	8	760
98	6	588
<u>100</u>	<u>9</u>	<u>900</u>

Totals: 108 8,180

Average: 75.74 Percent (8,180 ÷ 108)

Brookings County but not Brookings Community Residence

<u>Percentage Spent</u>	<u>Frequency</u>	<u>Weighted Index Per Category</u>
0	4	0
5	2	10
10	6	60
15	1	15
20	4	80
25	2	50
40	2	80
50	2	100
60	1	60
70	2	140
75	3	225
80	1	80
90	5	450
<u>100</u>	<u>1</u>	<u>100</u>

Totals: 36 1,370

Average: 38.06 Percent (1,370 ÷ 36)

Residence Outside Brookings County

<u>Percentage Spent</u>	<u>Frequency</u>	<u>Weighted Index Per Category</u>
0	2	0
7	1	7
10	2	20
25	1	25
35	1	35
40	1	40
50	4	200
<u>75</u>	<u>2</u>	<u>150</u>
Totals:	14	477
Average: 34.07 Percent (477 ÷ 14)		