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# 1987 MINNESOTA NEW FIRMS STUDY:

An Exploration of  
New Firms and Their  
Economic Contributions

by  
Paul Reynolds  
and  
Brenda Miller

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**Institutional Sponsor: Center for Urban and Regional Affairs**

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Edited by Mary Byers

NOTE: The Methodological Appendix, a  
separate document, provides the  
details of all procedures and the  
organization of the data file. A copy  
is available in the CURA library for  
examination.

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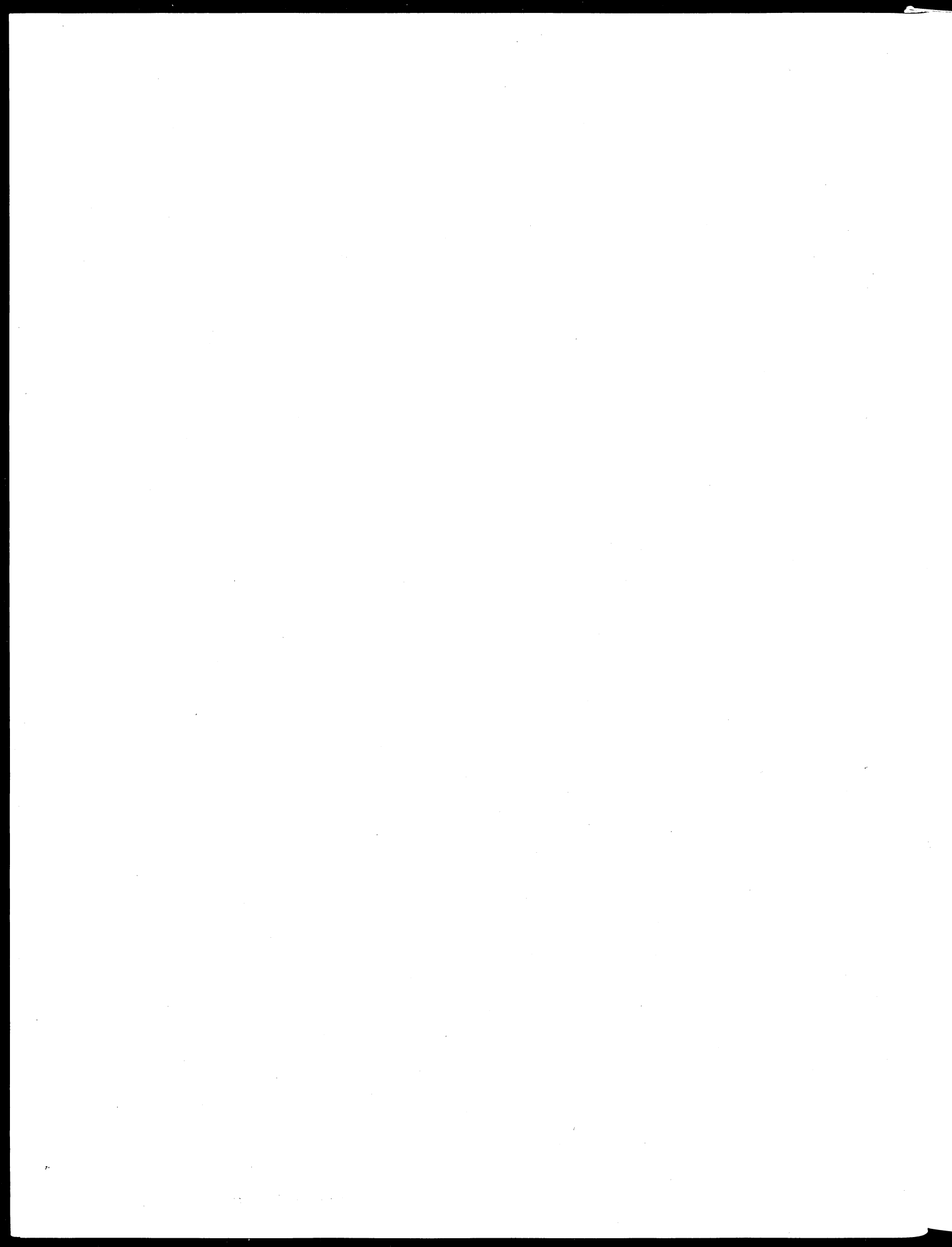
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## EXECUTIVE SUMMARY

The 12,000 to 28,500 new firms founded in Minnesota between 1979 and 1984 and active in 1986 were responsible for 6-14 percent of the 1986 jobs and 5-12 percent of the 1985 personal income. Further, the jobs provided by the new firms accounted for 42-99 percent of the net increase in Minnesota jobs between 1978 and 1986 and 12-29 percent of the net increase in personal income. Jobs provided by new firms represent a larger proportion of existing jobs in Greater Minnesota than in the Minneapolis-St. Paul region.

Such findings have led to greater interest by governments in strategies that may enhance the contributions of new firms. Three general emphases are possible: (1) improve the "business climate," (2) focus on new firms with a high potential for providing contributions, and (3) combine the two strategies.

This study considers the mechanisms behind the contributions of new firms in some detail. Most fundamental, these contributions reflect both the average (typical) contributions of new firms and the number founded, conveniently expressed as the annual birth rate. It is estimated that from 5,000 to 10,000 new firms are initiated in Minnesota annually. New firms in industries with substantial export potential (manufacturing, distributive services [wholesale], and business services) tend to be founded in regions with more mid-career adults, a greater proportion of college-educated adults, and higher per capita income, for example, the Twin Cities. The founding of firms in local market industries (construction, retail, consumer services) shows a lesser relationship to regional demographics; their emergence tends to reflect a turnover or replacement process.

There is substantial variation in the contributions of new firms: jobs provided range from none to over three hundred (average of nine); 1985 sales range from none to over \$25 million (average of \$538,000); and 1985 exports range from none (for 80 percent of the new firms) to over \$10 million (average of \$106,000). Predicting new firm contributions is possible, but it is not particularly affected by firm age (years since first sale). New firms in retail and consumer services were a major source of new jobs; new firms in manufacturing, distributive services (wholesale), and business services were equally important as sources of out-of-state exports.

The major factor that affects contributions is the growth rate established in the first twenty-four months after the first sale. One-third of the new firms have a high growth pattern, and these firms account for over two-thirds of all jobs, four-fifths of all sales, and nine-tenths of all exports.

Those starting new firms are relatively satisfied with the local context, regardless of the state region. One notable exception is the universal dissatisfaction with taxes, which all consider very important. There is broad interest in government services, but different firms indicated strong interest in a different set of such services. Both the community college and the area vocational/technical institute (AVTI) system are seen as a useful source of educational and training assistance; graduates of these institutions have started new firms that are major sources of contributions.

The analysis of this data suggests that programs designed to locate and assist the small proportion of high-growth, export-oriented new firms may be the most efficient and effective. General attempts to improve the "business climate" may be both expensive and too diffuse to be effective.



## Chapter 1

### WHY STUDY NEW FIRMS?

Between 12,000 and 28,500 new firms, established in Minnesota between 1979 and 1984, survived into 1986.<sup>1</sup> In 1986 they contributed between 6 percent and 14 percent of all jobs and from 5 percent to 12 percent of all personal income. Their contributions were equal to 42-99 percent of the net growth in jobs between 1978 and 1986, and 12-29 percent of the net growth in personal income.<sup>2</sup>

Table 1.1. MINNESOTA JOBS AND PERSONAL INCOME, 1978-86

	Total			Total	
	All Private	Nonfarm Sectors	Net	Contributions of New Firms	
	(excludes farms and governments)			(first sales, 1979-84)	
	1978	1986	Growth	Minimum (N = 12,140)	Maximum (N = 28,499)
Jobs (thousands)	1,646	1,928	282	119	280
Salaries, wages, proprietors' in- come (millions)	19,206	33,345	14,139	1,749	4,105

These contributions are from new firms that did not exist as economic entities prior to 1979. None are branches or subsidiaries of established business firms. This report is intended to provide an improved understanding of the processes that lead to the economic and social contributions provided by new--not always small--firms.

These contributions are not uniform: there is substantial variation between industries, location in the state, and among new firms themselves. New firms may be separate, but are not equal in terms of their contributions (jobs, sales, and exports).

#### UNDERSTANDING ECONOMIC CONTRIBUTIONS

One strategy has dominated attempts to understand and explain economic outputs (goods/services, jobs). This is to consider the factors of production (land,

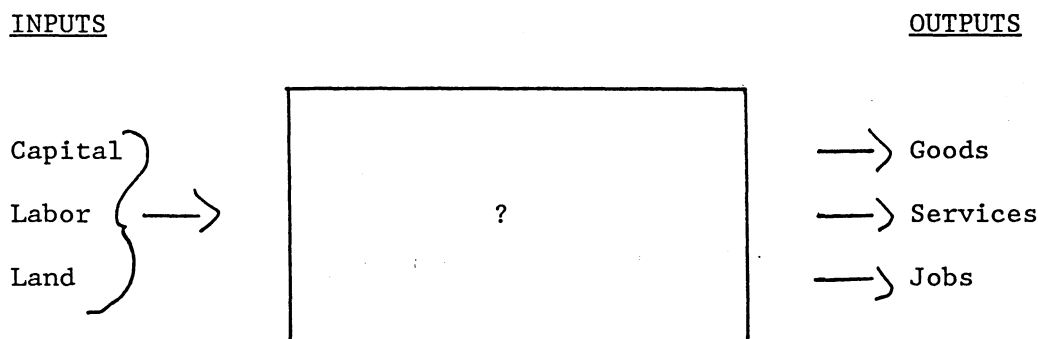
<sup>1</sup> The basis for the range of estimates in the number of new firms is discussed in Appendix B.

<sup>2</sup> Data on Minnesota taken from Tables SA25 and SA5 provided by the Regional Economic Information System, Bureau of Economic Analysis, U.S. Department of Commerce, April 1987.

labor, and capital) as they relate to outputs (goods, services, jobs, taxes). This model is presented in Figure 1.1. Regardless of the number of input variables or the sophistication of the quantitative model, the intermediate processes (indicated by "?") are deemphasized. The precise causal mechanisms by which the factors of production are combined to produce jobs and goods/services are usually not specified in this strategy.

One purpose of this project is to supplement, not replace, this widely used model of economic growth by enhancing the understanding of the entities--business firms--that are the intervening economic processes.

Figure 1.1. BASIC ECONOMIC MODEL



In the United States, this "intervening mechanism"--the major source of jobs, goods, and services--consists primarily of private business firms. In Minnesota alone, about 100,000 individual establishments are providing goods/services and jobs.<sup>3</sup>

Three general strategies for promoting economic development can be considered. One is to focus on reducing the costs of production or improving the quality of inputs. For example, a subsidy to lower interest rates for all borrowers (business and consumers) or improved education to enhance worker skills. A second strategy is to assist selected entities that make up the intervening mechanisms, such as a subsidized loan to a specific firm that may, in turn, increase employment and exports. A third approach would be to combine these two strategies.

The basic intent of this report is to explore the development and contributions of new firms. This, in turn, may help guide the formulation of policies to promote economic growth.

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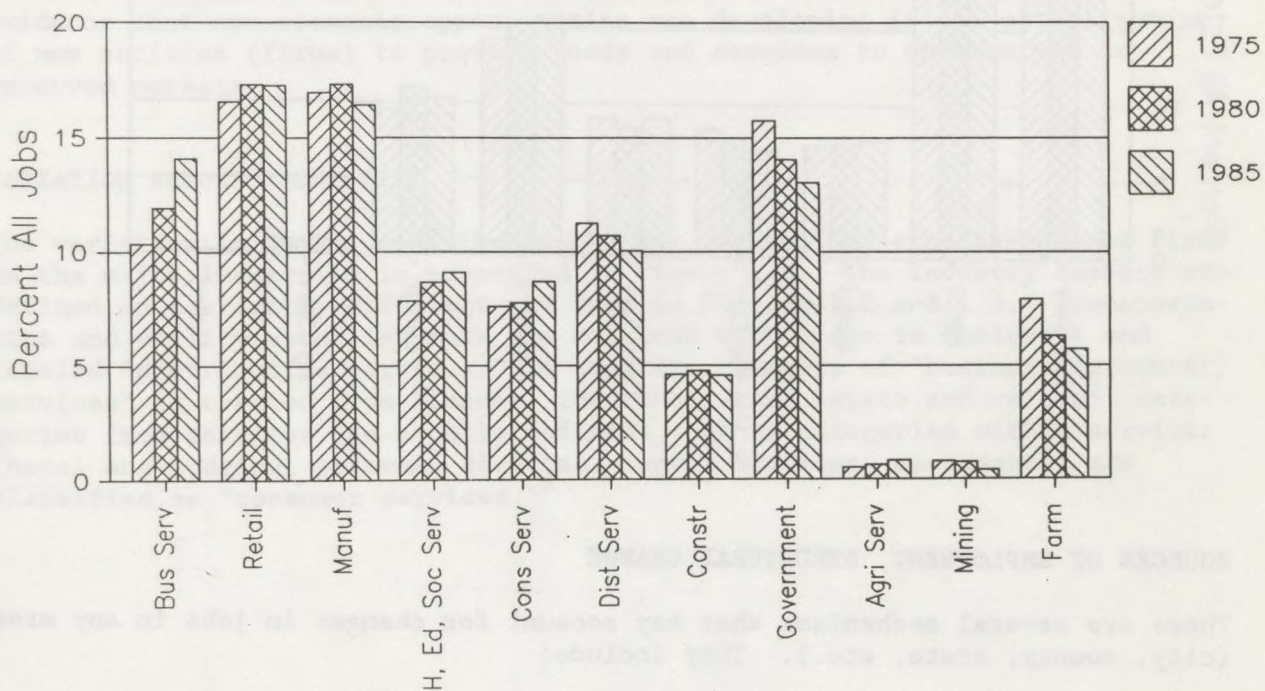
<sup>3</sup> Establishments are defined as operating entities at a single location providing a good or service. New firms are almost universally single establishments. Existing firms may consist of multiple establishments. See Appendix A for a more complete discussion.

## STRUCTURAL CHANGE IN MINNESOTA'S ECONOMY

The employment structure in Minnesota, as in many parts of the United States, is undergoing considerable change. Fluctuations in the number of jobs and establishments<sup>4</sup> are viewed with considerable alarm in those industries with major losses.

Less widely known is employment expansion in a variety of areas--expansions that have kept the job pool constant. The changes in Minnesota's employment for all industry sectors from 1975 to 1985 are presented in Figure 1.2.<sup>5</sup> The percentages were derived from the total number of full- and part-time jobs, which increased steadily from 1.9 million (1975) to 2.2 million (1980) and finally to 2.4 million (1985). The largest decreases were in distributive services, government, and farm employment (but not agricultural service); the largest increases were seen in business services, health/educational/social services, and consumer services. Other industry sectors show little or no change.

Figure 1.2. EMPLOYMENT CHANGES IN MINNESOTA BY INDUSTRY, 1975-85



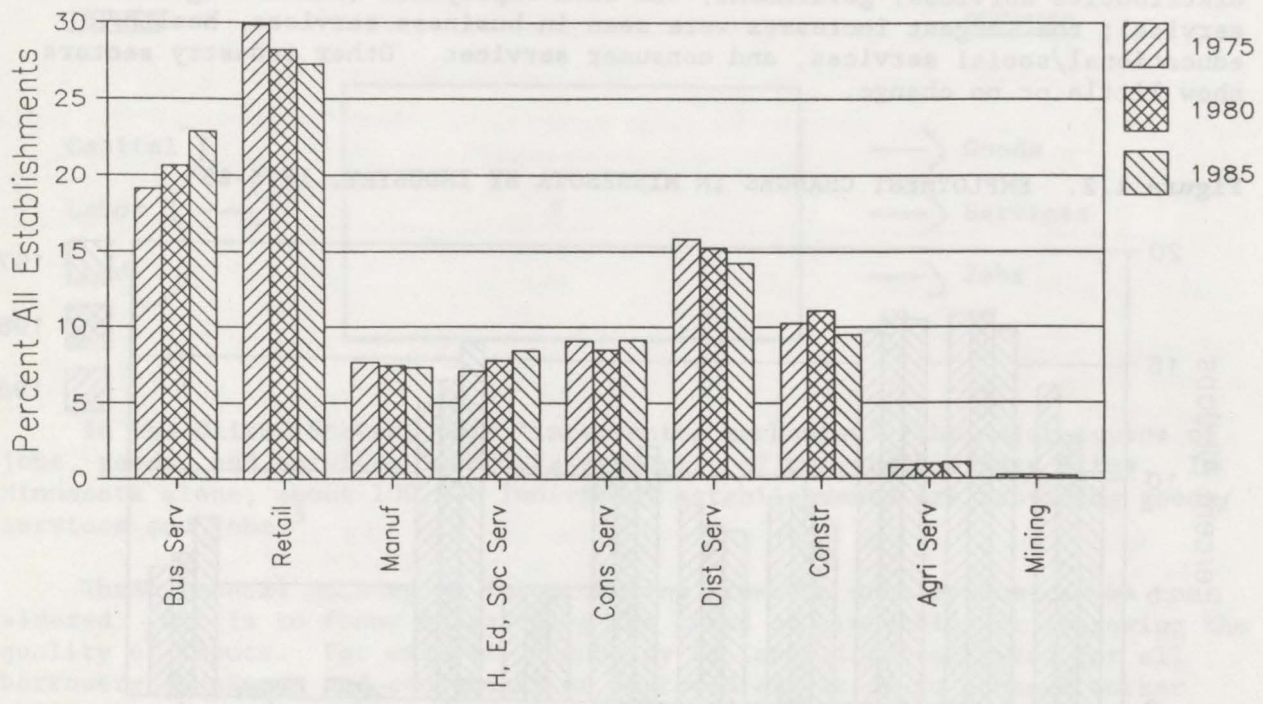
<sup>4</sup> This refers to stand-alone economic entities, not always the entire legally defined business organization.

<sup>5</sup> Based on Table SA25 provided by the Regional Economic Information System, Bureau of Economic Analysis, U.S. Department of Commerce, April 1987. Includes full- and part-time employment.



A comparable analysis of the distribution of establishments is presented in Figure 1.3.<sup>6</sup> This reflects only nonfarm, private-sector business entities. The number of establishments has been steadily increasing; a total of 77,000 is recorded for 1975, 85,000 for 1980, and 104,000 for 1985. The pattern of industry-sector distribution is similar to that of the distribution of jobs. Relative increases were seen in the proportion of business service and health/educational/social service establishments, and relative decreases were seen in retail, distributive services, and construction establishments. The other industry sectors--manufacturing, consumer services, agricultural services, and mining--reflect little change. Most of these shifts are observed nationwide.

Figure 1.3. ESTABLISHMENT CHANGES IN MINNESOTA BY INDUSTRY, 1975-85



#### SOURCES OF EMPLOYMENT, STRUCTURAL CHANGE

There are several mechanisms that may account for changes in jobs in any area (city, county, state, etc.). They include:

- Birth: Firms or establishments are created.
- Expansion: Existing firms or establishments increase in size.
- Move in: Existing firms or establishments move into a region.

<sup>6</sup> This is based on the data from *County Business Patterns* and includes only business entities that have reported paid employees. The procedures for counting establishments were changed between 1982 and 1983, which may increase the proportion of temporary or seasonal establishments.



Death:	Firms or establishments disappear (die).
Contractions:	Firms or establishments shrink (become smaller).
Move out:	Firms or establishments move out of a region.

There is little disagreement over the existence of these different processes; the major discussions concern the relative importance of each for the net change in jobs, establishments, and firms.

Recent research has suggested that a major source of new jobs is the creation of new firms and the expansion of existing small firms. However, the lack of reliable data on firms, particularly births and deaths, makes this a difficult area to study. Most economic information is gathered on inputs (interest rates, labor costs, etc.) and outputs (jobs, gross national product, etc.) rather than the characteristics of the intervening mechanisms. New firm births and small firm expansions are estimated to account for 40-80 percent of net new jobs.<sup>7</sup>

In addition to the creation of new jobs, new firms are of further interest as an indicator of the future directions of the economy. The future structural form makes its first appearance not as a planner's romantic vision but rather in the nature of new firms being established. Perhaps the best evidence that new economic opportunities are developing is the establishment of new entities (firms) to provide goods and services to underserved or unserved markets.

#### VARIATION ACROSS INDUSTRIES

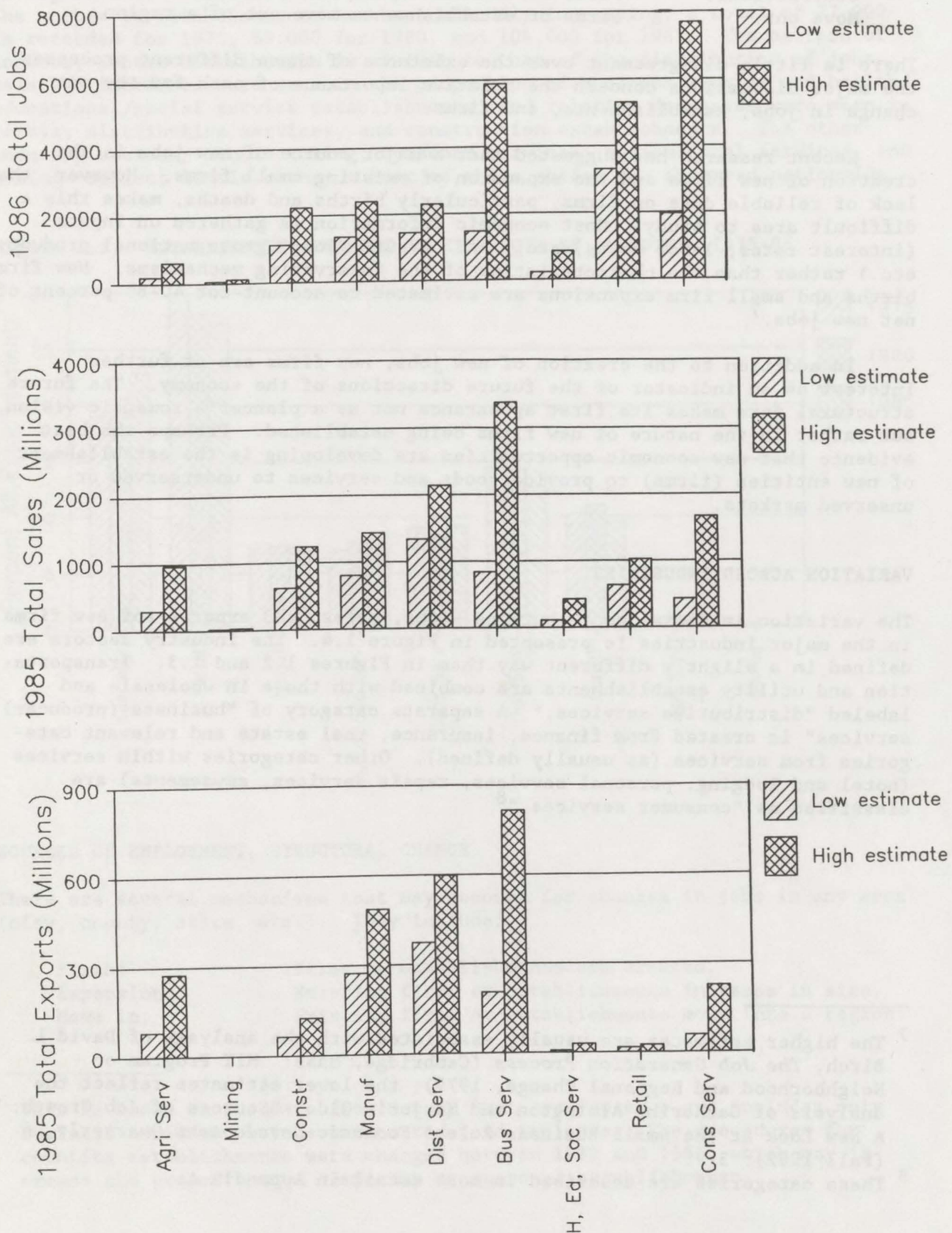
The variation in social contributions--jobs, sales, and exports--of new firms in the major industries is presented in Figure 1.4. The industry sectors are defined in a slightly different way than in Figures 1.2 and 1.3. Transportation and utility establishments are combined with those in wholesale and labeled "distributive services." A separate category of "business (producer) services" is created from finance, insurance, real estate and relevant categories from services (as usually defined). Other categories within services (hotel and lodging, personal services, repair services, amusements) are classified as "consumer services."<sup>8</sup>

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<sup>7</sup> The higher estimates are usually associated with the analysis of David L. Birch, *The Job Generation Process* (Cambridge, Mass: MIT Program on Neighborhood and Regional Change, 1979); the lower estimates reflect the analysis of Catherine Armington and Marjorie Olde, "Sources of Job Growth: A New Look at the Small Business Role," *Economic Development Quarterly*, 6 (Fall 1982): 3-7.

<sup>8</sup> These categories are described in more detail in Appendix A.

Figure 1.4. TOTAL NEW FIRM CONTRIBUTIONS BY INDUSTRY



Further, a range of estimates of the aggregate contributions is provided, reflecting the problems in estimating the total number of new firms.<sup>9</sup> The greatest range in estimates is seen in producer services, retail, and consumer services. These are industry sectors in which a private credit-rating service (Dun and Bradstreet) is most likely to miss a significant proportion of new firms, perhaps because they need less financial support (loans, credit, or capital) than those in manufacturing and distributive services.

Despite the range of estimates, the aggregate contributions of new firms vary substantially by industry. Retail and consumer service new firms are a major source of new jobs, although construction, manufacturing, distributive service, and business service new firms also make substantial contributions. New firms in five industry sectors are a major source of new sales: distributive services, construction, manufacturing, business services, and retail. Agricultural service and consumer service new firms also make significant contributions. The primary sources of out-of-state exports are manufacturing, distributive service, and business service new firms. Modest exports are provided by agriculture service, construction, and consumer service new firms.

The significance of new firms in relation to existing firms is determined by the proportion of all current jobs provided by new firms. This is presented, for both high and low job estimates, in Figure 1.5. The industry sectors fall into three groups: new firm jobs account for 10-30 percent of all jobs in construction, agricultural services, and consumer services; 5-15 percent of all jobs in retail, mining, distributive services, and business services; and 2-5 percent of all jobs in manufacturing and health, education, and social services.

This difference in aggregate or total contributions is due, in part, to the differences in the average contributions of different industry sectors. The average new firm contributions--jobs, sales, and exports--are given for each industry listed in Table 1.2. This represents the basic data gathered in the 1986 survey of Minnesota new firms.

---

<sup>9</sup> In this analysis, two estimates of the number of new firms are used. The first is based on the estimated population of new establishments in the lists of Dun's Marketing Services, reduced by 50 percent, the percentage found not to be active in the phone verification of Dun's listings. The second is this figure with a correction factor for the new firms missed by Dun's field staff. These two figures provide a range of estimates. These ranges vary substantially across industry sectors, reflecting the differential effectiveness of Dun's procedures in capturing new firms. Coverage of new firms tends to be more timely if large amounts of credit are required to initiate the new firm. See Appendix B for details.



Figure 1.5. PERCENT OF NEW FIRM JOBS BY INDUSTRY SECTOR, 1986

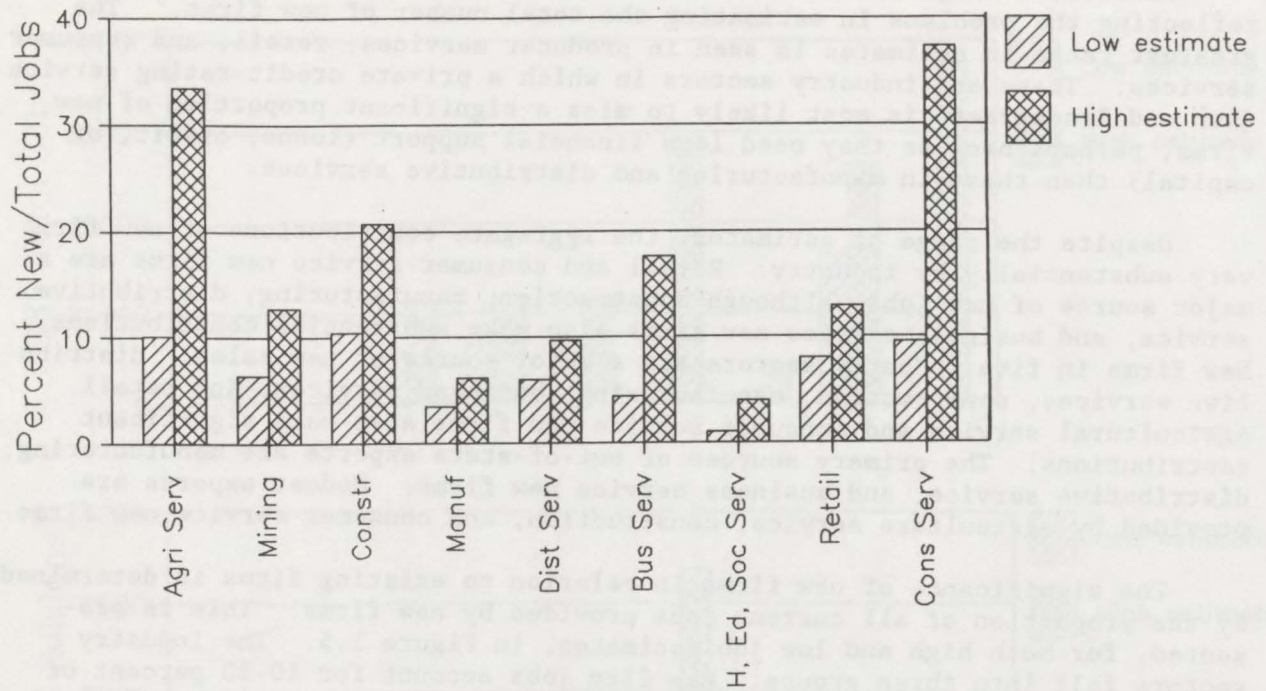


Table 1.2. AVERAGE NEW FIRM CONTRIBUTIONS BY INDUSTRY

	No. in Weighted Sample <sup>a</sup>	1986 Jobs	1985 Sales (\$1,000)	1985 Out-of-state Exports (\$1,000)
All responding firms	1,119	9.0	514	106
Agriculture services	20	7.8	1,181	334
Mining <sup>b</sup>	1	28.4	813	0
Construction	109	9.8	540	55
Manufacturing	143	10.3	617	210
Distributive services	188	8.3	766	215
Business services	180	8.1	462	112
Retail	321	9.1	455	31
Consumer services	128	7.7	148	4
Health, education, social services	30	15.0	325	44
Total providing data		1,103	918	916

<sup>a</sup> Weighted to represent the total number of establishments in Dun's Marketing Identifier file as of October 1986.

<sup>b</sup> Analyses of industries do not include mining.



Two patterns are significant. First, there is variation among the averages for different industries: industry averages for 1986 new firm jobs range from eight to fifteen; industry averages for 1985 new firm sales from \$148,000 to \$1,181,000; and industry averages for 1985 new firm exports from \$4,000 and less to \$334,000. Second, this variation may be the greatest for exports, because average exports are substantial (over \$100,000/year) in only four industry areas: agriculture, manufacturing, distributive services, and business services. The average for agriculture, however, is enhanced by a single grain-handling firm with unusually high sales and exports--one risk of small samples.

#### VARIATION ACROSS REGIONS

Minnesota has been divided into thirteen development regions as shown in Figure 1.6. The average contributions of new firms in each region are presented in Table 1.3. The variation is substantial, as great as across industry sectors: 1986 employment varies from an average of four to seventeen; 1985 sales from an average of \$185,000 to \$819,000; 1985 out-of-state exports from \$2,000 to \$212,000. This reflects the existing economic structure and, in turn, the types of new firms that emerge in different regions.

Figure 1.6. MINNESOTA DEVELOPMENT REGIONS

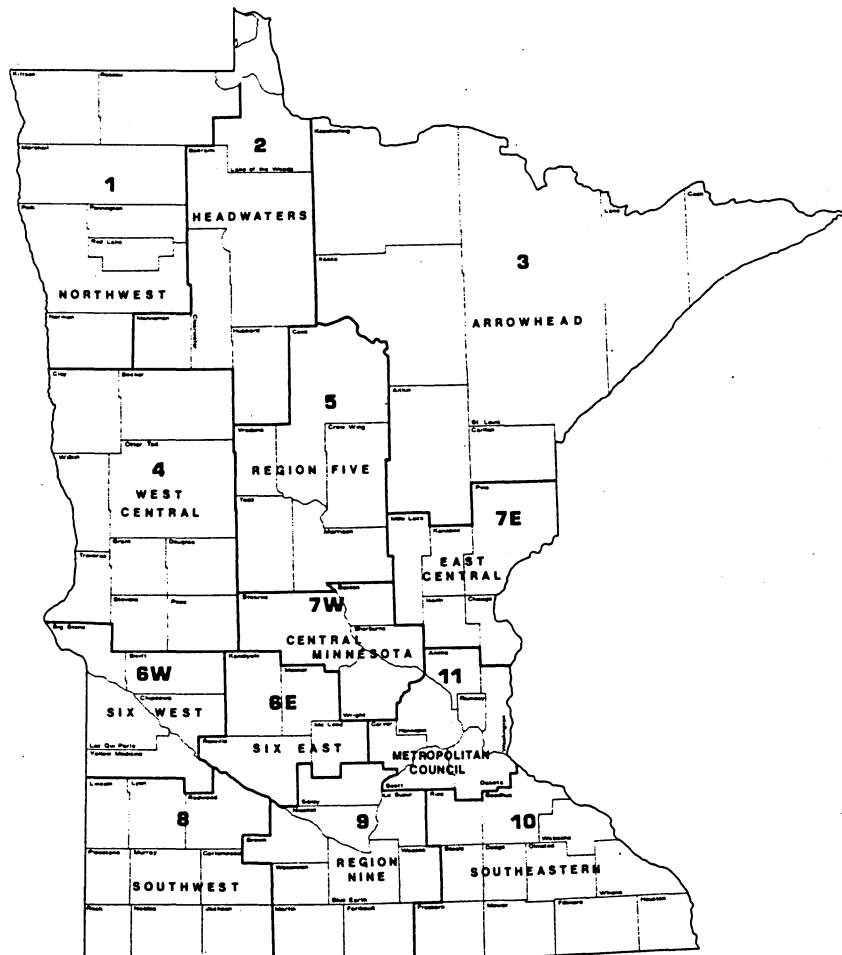


Table 1.3. AVERAGE NEW FIRM CONTRIBUTIONS BY REGION

	No. in Weighted Sample <sup>a</sup>	1986 Jobs	1985 Sales (\$1,000)	1985 Out-of-state Exports (\$1,000)
All Responding Firms	1,119	9.0	514	106
1 Northwest	10	8.7	166	52
2 Headwaters	9	4.2	168	40
3 Arrowhead	58	7.3	326	47
4 West Central	40	8.0	358	116
5 Region Five	29	12.2	940	385
6W Six West	8	6.4	123 <sup>b</sup>	14
6E Six East	16	11.8	675	115
7W Central Minnesota	42	10.2	1,097	109
7E East Central	13	5.2	376	4
8 Southwest	21	5.9	261	11
9 Region Nine	35	6.4	343	64
10 Southeastern	57	7.2	312	74
11 Metropolitan Council	781	9.9	571	112

<sup>a</sup> Weighted to represent the total number of establishments in Dun's Marketing Identifier file as of October 1986.

<sup>b</sup> Excludes a single grain-handling firm with reported sales in excess of \$10 million.

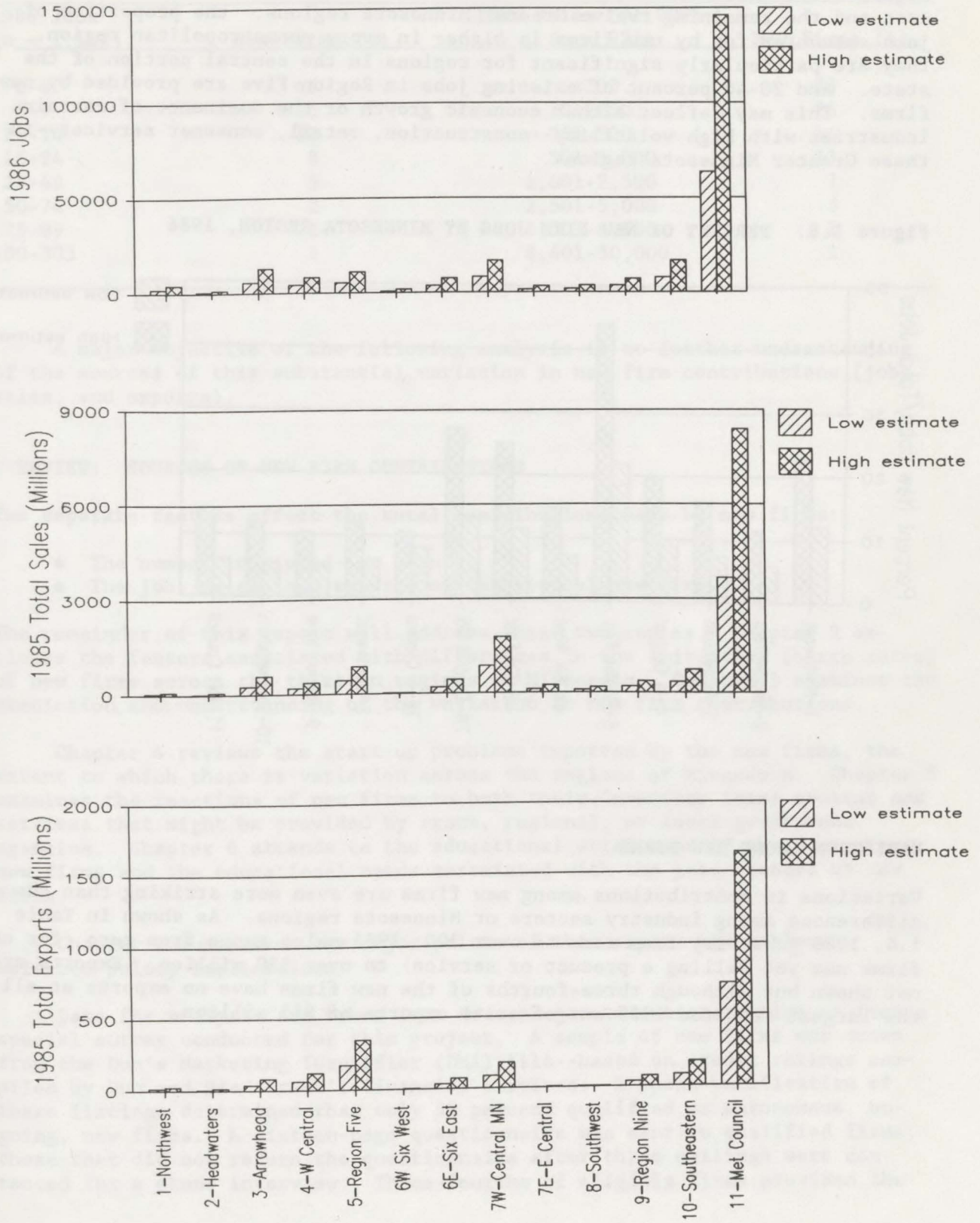
The estimated total contributions of jobs, sales, and exports for each region are presented in Figure 1.7. As with the analysis by industry sector, the variation in estimates reflects ambiguity regarding the actual number of new firm births.

There is not, however, much uncertainty about the region receiving the greatest absolute benefits from new firms. New firms in the Twin Cities metropolitan region provide jobs, sales, and out-of-state exports roughly twice those of the rest of the state combined. This reflects, more than anything else, the most significant factor affecting new firm foundings (or births): they are created in regions with high levels of economic activity and a high density of business entities.

These differences point to variation in both industry sector and growth patterns typical of new firms in each region.<sup>10</sup>

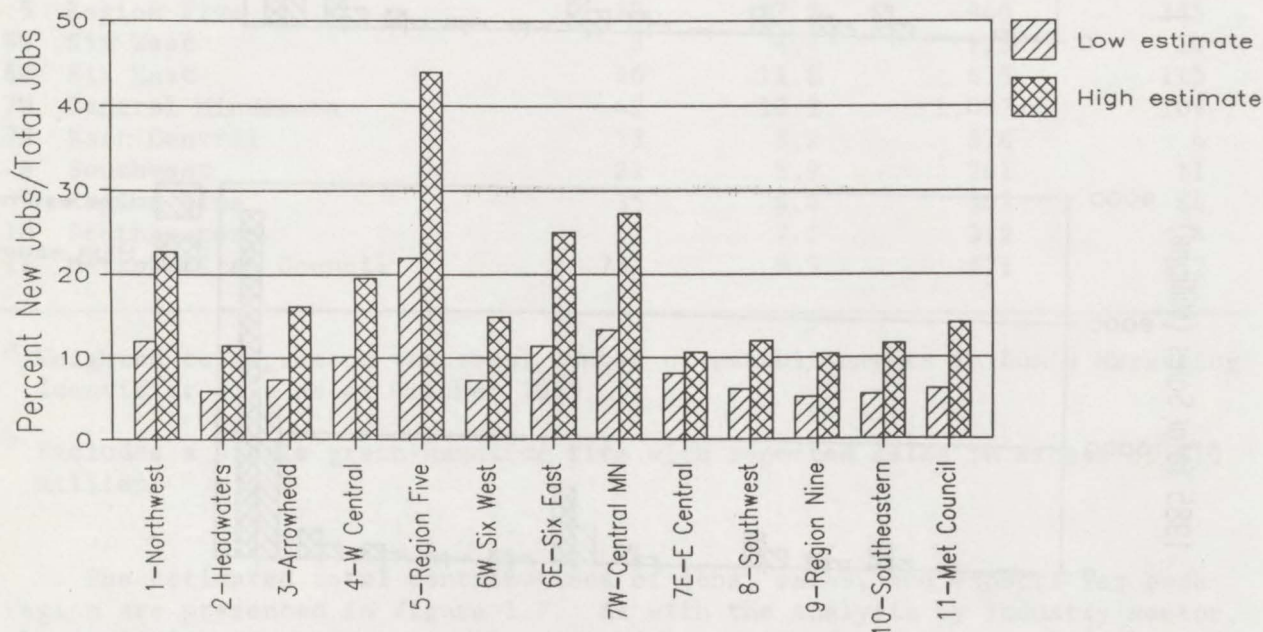
<sup>10</sup> The range of estimates in Table 1.3 reflects the same adjustments discussed in footnote 9 related to Figure 1.4 and reviewed in Appendix B.

Figure 1.7. MINNESOTA REGION AND TOTAL NEW FIRM CONTRIBUTIONS



The relative significance of new firms for the regional economies is indicated by the proportion of all existing jobs provided by new firms (see Figure 1.8). Most dramatic is the clear difference between the Twin Cities area and the remaining twelve Greater Minnesota regions: the proportion of jobs accounted for by new firms is *higher* in every nonmetropolitan region. They are particularly significant for regions in the central portion of the state. And 20-40 percent of existing jobs in Region Five are provided by new firms. This may reflect either economic growth or the dominance of certain industries with high volatility--construction, retail, consumer services--in these Greater Minnesota regions.

Figure 1.8. PERCENT OF NEW FIRM JOBS BY MINNESOTA REGION, 1986



#### VARIATION AMONG NEW FIRMS

Variations in contributions among new firms are even more striking than the differences among industry sectors or Minnesota regions. As shown in Table 1.4, 1986 jobs vary from zero to over 300; 1985 sales range from zero (for new firms not yet selling a product or service) to over \$20 million. Exports are not shown but although three-fourths of the new firms have no exports at all, the largest reported 1985 out-of-state exports of \$15 million.

Table 1.4. DISTRIBUTION OF JOBS AND SALES AMONG NEW FIRMS

1986 Jobs (n = 1,102)	New Firms (%)	1985 Sales (\$1,000) (n = 921)	New Firms (%)
0-4	46	<100	33
5-9	26	101-250	26
10-14	11	251-500	16
15-24	8	501-1,000	13
25-49	5	1,001-2,500	7
50-74	2	2,501-5,000	3
75-99	1	5,001-8,600	1
100-303	1	8,601-30,000	1

A major objective of the following analysis is to further understanding of the sources of this substantial variation in new firm contributions (jobs, sales, and exports).

#### OVERVIEW: SOURCES OF NEW FIRM CONTRIBUTIONS

Two separate factors affect the total contributions made by new firms:

- The number initiated--or born.
- The job, sales, and exports of the typical new firm.

The remainder of this report will address these two topics. Chapter 2 explores the factors associated with differences in the initiation (birth rates) of new firms across the thirteen regions in Minnesota. Chapter 3 examines the prediction and understanding of the variation in new firm contributions.

Chapter 4 reviews the start-up problems reported by the new firms, the extent to which there is variation across the regions of Minnesota. Chapter 5 examines the reactions of new firms to both their immediate local context and services that might be provided by state, regional, or local government agencies. Chapter 6 attends to the educational attainment of those starting new firms and the educational needs associated with the jobs created by new firms.

Chapter 7 summarizes the major points of this report and explores selected policy implications.

Data for analysis are taken from federal government statistics or from a special survey conducted for this project. A sample of new firms was drawn from the Dun's Marketing Identifier (DMI) file--based on credit ratings compiled by Dun and Bradstreet's financial services. A phone verification of these listings determined that only 50 percent qualified as autonomous, on-going, new firms. A sixteen-page questionnaire was sent to qualified firms; those that did not return the questionnaire after three mailings were contacted for a phone interview. Three-fourths of eligible firms provided the

critical information requested by the survey. A more complete summary of the research procedure is given in Appendix C of this report; the questionnaire is included in Appendix D. Full details of the research procedure are available in the Methodological Appendix, a separate document.

High confidence that the sample is representative of all new firms in Minnesota is justified by the close match of the sample with the best available censuses of business establishments; the careful screening of firms that were not new, not autonomous start-ups, and not active; and the high response rate.



## Chapter 2

### NEW FIRM EMERGENCE

Before a new firm can make a contribution--provide jobs, sales, or exports--it must be created. The full impact of new firms is substantially affected by their total number. This chapter will first consider estimates of the total number of new firms established each year in Minnesota. While there is substantial variation in the incidence of firm creation across regions, there is also regional variation in the size of human and organizational populations. Therefore, the following analysis will present an across-region comparison based on the annual rate of new firm foundings as a proportion of existing business entities.

Fluctuations in the annual birth rate are substantially less than the variation in absolute births. Nonetheless, there are still considerable differences among the thirteen regions of Minnesota. Some regions are more fertile for new firm births than others. This leads to a preliminary exploration of selected factors that may be related to variations in region fertility. These are, in a sense, the characteristics of a socioeconomic system that can affect outputs.

There is a major interest in the contributions of new firms to exports. The analysis in Chapter 1, particularly Figure 1.4, indicated that new firm contributions to out-of-state exports came almost entirely from three industries. Manufacturing, distributive services, and business services will be treated and referred to as "export potential" industries. Not all firms in these industries export; firms that do export, however, are quite likely to be in one of these industries. Firms in export-oriented industries are also more likely to involve more complex, sophisticated products, services, or internal technology. These may require more educated personnel and greater capital investment.

In the other industry sectors, total export contributions are quite small. Dominated by new firms in construction, retail, and consumer services, they will be referred to as "local market."

#### NEW FIRM BIRTHS

There is no public census of new firm births, or deaths, for Minnesota.<sup>1</sup> As a result, it is necessary to use available data to estimate new firm births. The estimates used for this analysis are based on the data provided by Dun's Marketing Identifier (DMI) files. They are summarized in Table 2.1; details are given in Appendix B.

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<sup>1</sup> This need not be the case, for the state has this information as part of the data collected with unemployment insurance payments. Other states, e.g., Mississippi, have used this information to provide annual descriptions of establishment births and deaths.

Table 2.1. ESTIMATES OF MINNESOTA NEW FIRM BIRTHS

	New Firm Births (1979-84)	Average Annual Births	Annual Birth Rate (per 1,000) <sup>a</sup>
Original Dun's Marketing Identifier count	24,293	4,048	42
Corrected for new firms missed by Dun & Bradstreet field staff <sup>b</sup>	56,999	9,500	98
Corrected for listings that are not new, autonomous, and still in business <sup>c</sup>	28,499	4,750	49

<sup>a</sup> Assumes 97,292 establishments.

<sup>b</sup> David Birch and Susan McCracken, "The Small Business Share of Job Creation: Lessons Learned from the Use of a Longitudinal File" (Cambridge, Mass.: MIT Program on Neighborhood and Regional Change, mimeo., March 1983).

<sup>c</sup> Based on results of phone verification interviews completed in Minnesota; 50 percent estimated as ongoing, new firms that started autonomously.

Other analyses of new firm births provide confidence that these are reasonable estimates. A study completed on new firms filing unemployment insurance in Minnesota found that the 1977 birth rate of establishments was 91 per thousand 1976 establishments.<sup>2</sup> Data on Mississippi for 1984 indicate a birth rate of 116 per thousand establishments existing in 1983.<sup>3</sup> Analysis of entries into the unemployment insurance file in Tennessee yielded an average of 111 entries per thousand existing establishments over a six-year period (1980-85).<sup>4</sup>

Applying the annual birth rate reported for Mississippi (116/1,000) to Minnesota would provide an upper estimate of 11,286 new firms each year. A

<sup>2</sup> John Tazell, "Survival of Minnesota New Businesses: 1977-1980." *Review of Labor and Economic Conditions*, Minnesota Department of Economic Security, 9 (August 1982): 10-17. For 1977 there were 7,105 new filings; *County Business Patterns* lists 77,937 Minnesota establishments for 1976.

<sup>3</sup> Mississippi Employment Security Commission, Labor Market Information Department, "Mississippi's Business Population: Births, Deaths & Changes in Ownership--1984," August 1985. Excluding public administration establishments, they report 5,587 new listings appeared in 1984; 48,340 existed in 1983.

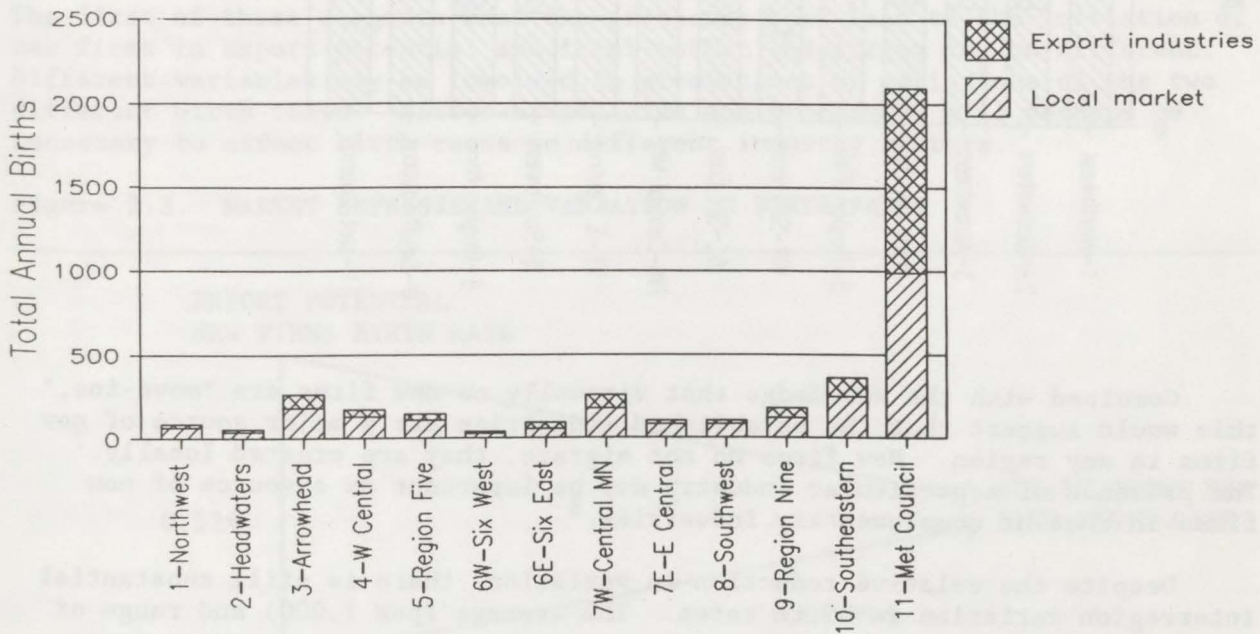
<sup>4</sup> William F. Fox et al., *Entries and Exits of Firms in the Tennessee Economy: 1980-1985*, publication number E01-1490-010-87 (Knoxville: University of Tennessee, Center for Business and Economic Research, May 1987).

minimum estimate would be the uncorrected counts based on Dun's Market Identifier file, about 4,000 or 40 per thousand per year.

As a conservative estimate of new firm births, the count derived from the DMI file (a total of 24,293 for six years or an average of 4,048 each year) is used in the following analysis.<sup>5</sup> It is the basis for the estimate of the annual number of new firms to emerge in each of the thirteen regions of Minnesota, as presented in Figure 2.1.

Of the new firm births in Minnesota, 53 percent occurred in the Minneapolis-St. Paul (Twin Cities) metropolitan region. Perhaps more striking is that two-thirds of the new firms in the three export potential industries emerged in this region.

Figure 2.1. MINNESOTA REGIONS AND TOTAL ANNUAL NEW FIRM BIRTHS (AS ESTIMATED OVER 1979-84)



#### BIRTH RATE VARIATION ACROSS MINNESOTA REGIONS

The total number of new firms initiated in the thirteen regions of Minnesota varies by a factor of 50 (from 40 to 2,000). This and the dramatic variation in economic activity among these regions suggest a standardized measure--a birth rate. The birth rate for new firms is estimated for each region by dividing the estimate of the annual number of new firms by the number of existing establishments (per 1,000).<sup>6</sup> New firm birth rates are presented in

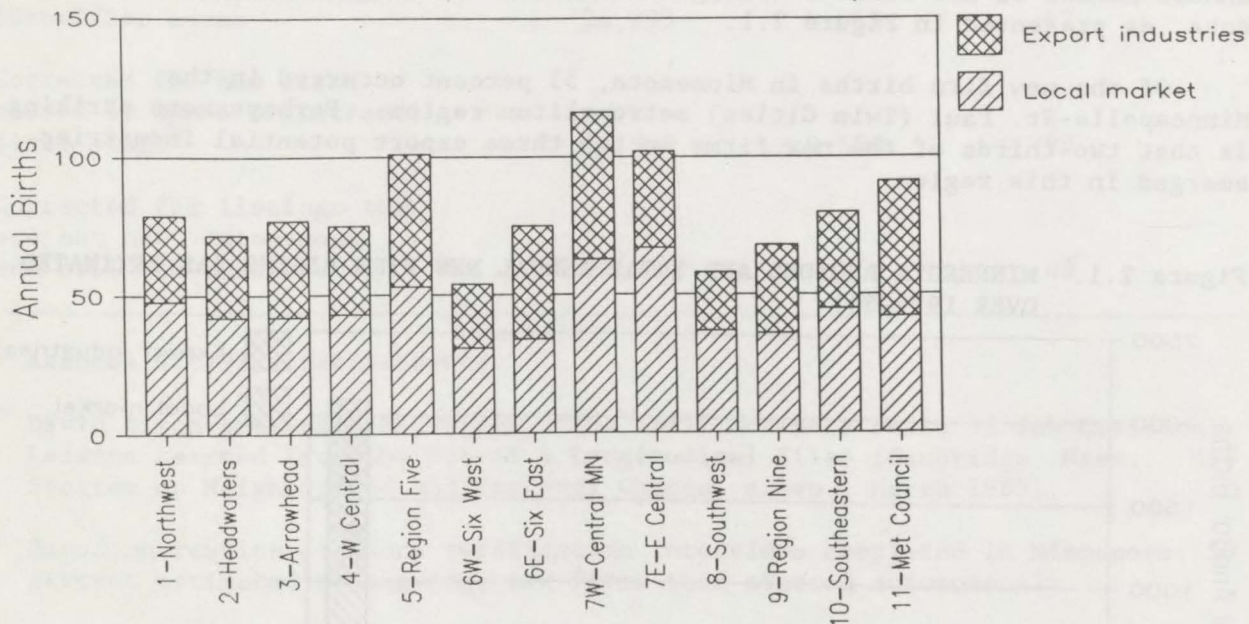
<sup>5</sup> It is very close to the best estimate of 53,784 after the two corrections are completed (see Appendix B for details).

<sup>6</sup> Based on the count of establishments in *County Business Patterns* for 1983.



Figure 2.2 for two types of industry sectors--local market and those with export potential. The range of annual birth rates is considerably narrower (a factor of 2.0) than the range of absolute births (a factor of 50).

Figure 2.2. MINNESOTA REGIONS AND NEW FIRM BIRTH RATES PER 1,000 ESTABLISHMENTS (AS ESTIMATED OVER 1979-84)



Combined with the knowledge that virtually no new firms are "move-ins," this would suggest that the established industries are a major source of new firms in any region. New firms do not migrate, they are created locally.<sup>7</sup> The presence of a particular industry may be important as a source of new firms in that or complementary industries.<sup>8</sup>

Despite the relative reduction in variation, there is still substantial interregion variation in birth rates. The average (per 1,000) and range of annual birth rates are as follows:

	Average	Range
All industries	81	54-116
Export potential	36	21-53
Local market	45	31-67

<sup>7</sup> See the discussion at the beginning of Chapter 4.

<sup>8</sup> The background of those that start new firms increases confidence in this interpretation: most new firm start-up teams are dominated by those with substantial business experience, and most of this experience is in the same industry.

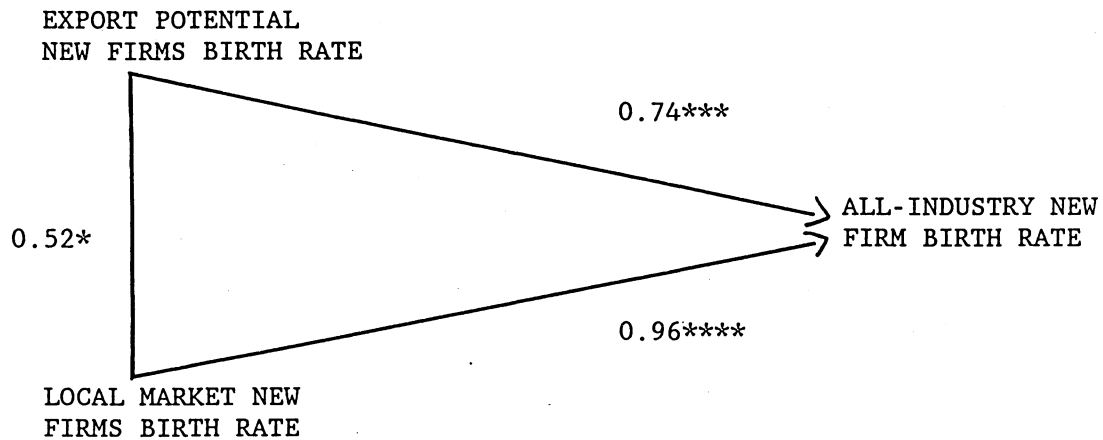
This raises an important question regarding the relationship of birth rates in these different types of industries: "Are export potential birth rates systematically related to local market birth rates?" If highly related, the same policies can be adopted to promote new firm births in all industries. If unrelated, it suggests different policies may be required to stimulate different types of new firms.

The correlations between three estimates of new firm births--all firms, those with export potential, and local market--are provided for the thirteen Minnesota regions in Figure 2.3. Despite the small number of units for analysis (thirteen regions), two important patterns are seen:

- There is a modest statistically significant relationship between the birth rates of export potential and local market new firms.
- The all-industry birth rate appears to reflect the local market new firm birth rate more than the export potential new firm birth rate.

The first of these suggests that the processes that lead to the initiation of new firms in export-potential and local-market industries may be different. Different variables may be involved in predictions of variations of the two different birth rates. Different policies and procedures will perhaps be necessary to affect birth rates in different industry sectors.

Figure 2.3. MARKET EMPHASIS AND VARIATION IN BIRTH RATES



1. Numbers indicate Pearson Product Moment Correlations among all thirteen Minnesota regions.
2. Export potential new firms include those with primary classification (SIC codes) as manufacturing, distributive services (mostly wholesale), and producer (business) services. All others are placed in the local market category.
3. New firm (establishment) estimates are based on data provided by Dun's Marketing Services for firms established 1979-84 as of October 1985. A base count of total firms (establishments) has been developed from information reported in *County Business Patterns* (U.S. Department of Commerce) for Minnesota for 1983.
4. Two-tailed test of statistical significance: \*  $p < 0.05$ ; \*\*\*  $0.001 < p < 0.01$ ; \*\*\*\*  $0.0000 > p$ .

## REGIONAL CHARACTERISTICS AND NEW FIRM BIRTH RATES

Understanding the characteristics associated with interregion variations in new firm births involves, first, specifying the variables to be considered. It is clear that the number could be quite large. Based on the analysis of the start-up team characteristics in a 1984 pilot study of new firms,<sup>9</sup> and the recurring comment that the unemployed tend to start many new firms, four factors were selected to represent quite different characteristics of each region for a preliminary analysis:<sup>10</sup>

<u>General Feature</u>	<u>Operational Indicator</u>
Availability of jobs	Unemployment rate, 1980
Individual income	Per capita income, 1979
Pool of potential start-up team members	Percentage of adults 25-39 years old, 1980
Educational attainment	Percentage with high school experience, 1980 Percentage with college experience, 1980

Indicators for all characteristics were computed for each region by aggregating data on counties provided for the 1980 census. For per capita income this was based on 1979 income data; for all other variables it was current as of 1980. This was early in the six-year period for which new firm births were estimated, overlapping with 1979 and 1980, preceding the other four years, 1981-84. This provides some confidence that the regional characteristics preceded the new firm births, and that these regional characteristics were related to processes causing new firm births.<sup>11</sup>

The simplest measures of association between these region characteristics and variation in export potential new firm birth rates are presented in Table 2.2.

The highest levels of association with the birth rate of export potential new firms involve social, life-course characteristics rather than economic variables. The larger the percentage of midcareer adults and those with education beyond high school, the higher the birth rates of export potential

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<sup>9</sup> Paul D. Reynolds and Steve West, *New Firms in Minnesota: Their Contributions to Employment and Exports, Start-up Problems, and Current Status* (Minneapolis: University of Minnesota, Center for Urban and Regional Affairs, 1985).

<sup>10</sup> A complete portrayal of the socioeconomic character of a multicounty region would involve a much wider range of variables. This was beyond the capacity of the available resources.

<sup>11</sup> These associations may, however, be spurious. More research involving a wider range of regions is required to investigate this factor as thoroughly as it deserves.



new firms. The unemployment rate actually has a negative correlation with the birth rate of export potential new firms.

Table 2.2. FACTORS ASSOCIATED WITH EXPORT POTENTIAL NEW FIRM BIRTH RATES

		Pearson Product Correlation
Presence of young adults	Percentage of population between 25 and 39 years old	+0.64**
Advanced education	Percentage of adults over 25 with 16 or more years of education	+0.44
Public (high school) education	Percentage of adults over 25 with 12 or more years of education	+0.42
Personal income	Per capita income (1979)	+0.37
Availability of jobs	Unemployment rate	-0.24

Notes:

1. All data on development regions were taken from 1980 U.S. Census.
2. Two-tailed tests of statistical significance: \*\*  $0.01 < p < 0.05$ .

The negative correlation between the unemployment rate and the annual birth rates of export potential new firms suggests that starting export potential new firms does not seem to be a reaction to problems in locating a job.<sup>12</sup> Export potential new firms may emerge in regions with expanding economies, where the unemployment rate tends to be low.

The association between these same variables and the birth rates of local market new firms is presented in Table 2.3.

Here, the patterns are quite different. Of primary importance is that none of the associations is statistically significant. This suggests that the founding of new firms in local market industries is a general, widespread phenomenon that is not affected by the regional features included in this analysis. Two regional characteristics have a relatively higher association with new firm births, namely, the presence of young adults and a higher unemployment rate. This suggests that where young adults cannot find jobs, they may start new firms with a local market orientation.

<sup>12</sup> This is consistent with the career transitions reported by those starting new firms: less than 10 percent say they were unemployed prior to the new firm start-up.

Table 2.3. FACTORS ASSOCIATED WITH LOCAL MARKET NEW FIRM BIRTH RATES

		Pearson Product Correlation
Presence of young adults	Percentage of population between 25 and 39 years old	+0.27
Availability of jobs	Unemployment rate	+0.25
Advanced education	Percentage of adults over 25 with 16 or more years of education	-0.06
Public (high school) education	Percentage of adults over 25 with 12 or more years of education	-0.09
Personal income	Per capita income (1979)	-0.16

Note:

1. All data on development regions were taken from 1980 U.S. Census.
2. No correlations are statistically significant at 0.05 level.

In short, starting a construction firm, retail shop, or customer service facility may be a response to poor employment opportunities. Those starting new businesses may live in regions with contracting economies, as reflected in low incomes and higher unemployment rates--regions with an absence of new firms in export potential industries.<sup>13</sup>

Although tentative, this analysis is consistent with the initial finding, the low relationship between birth rates of local market and export potential new firms. Different regional characteristics appear related to the birth rates of the different types of new firms.

#### CONCLUSION AND IMPLICATIONS

The findings from this analysis, factors associated with variations in new firm births in the thirteen Minnesota regions, include:<sup>14</sup>

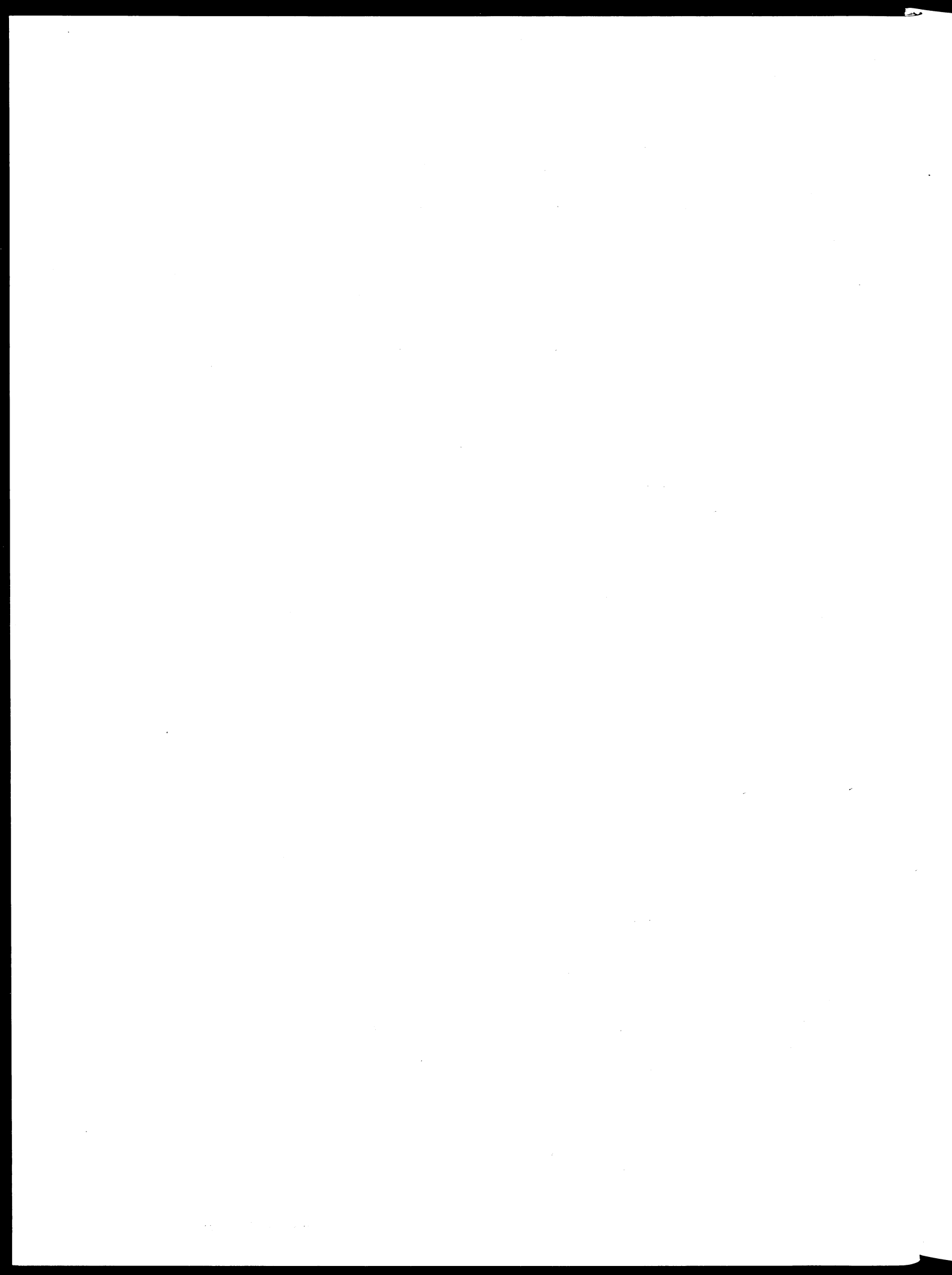
- <sup>13</sup> An analysis of new firm births in ten Pennsylvania regions (two major urban areas) found stronger support for this interpretation of the factors affecting local market new firm births. Paul Reynolds and Steve Freeman, *1986 Pennsylvania New Firm Survey Volume Two* (Washington, D.C.: Appalachian Regional Commission, 1987).
- <sup>14</sup> A major caution is associated with this analysis: the number of units of analysis is small (only thirteen regions were involved), and extreme values with such a small sample may lead to unreliable correlations--relations that are difficult to replicate.

- Evidence that the same factors are not equally significant in explaining the births of local market and export potential new firms.
- Evidence that education and life course or career stage are of major significance in births of export potential new firms; unemployment rates are not.
- Suggestive evidence that higher unemployment may lead to the founding of new construction, retail, and consumer service firms.

These findings, albeit preliminary, have implications for public policy. First, new firm births in different industry sectors may be unrelated (or have only a very modest relationship). There may be a time lag--not explored in this analysis--between the expansion of new firms in one industry and expansion in other industries in the same area.

Second, the most critical factors in the birth rates of new firms may be difficult to affect with public policy--at least in a short period of time. Most important is the presence of established firms in a given industry as the source of trained individuals in midcareer, those responsible for initiating new firms in export potential industries. It is these college-educated, experienced individuals between 30 and 49 who appear to be absent from rural regions. This may reflect the rural-urban migrations that have been occurring for decades.

On the other hand, an increased awareness of the population characteristics of a region can be helpful in guiding public programs to encourage new firms. The programs can be tailored to the types of firms (or industries) prevalent in the region and of interest to the indigenous population. After all, virtually all new firms in a given region are created by established residents.



## Chapter 3

### PREDICTING NEW FIRM CONTRIBUTIONS

The contributions (jobs, sales, exports) provided by new firms reflect both the number of firms initiated and their individual contributions. There is substantial variation in the contributions of individual new firms. The average number of new jobs provided in 1986 was 9.1, but the range was from zero to over 300. Average 1985 sales were \$538,000, but the range was from zero to \$29 million. Average 1985 exports were \$106,000, but the range was from zero to \$12 million; only one in three had any exports at all. Clearly, new firms are not equal in their contributions; this chapter will explore the sources of these variations.

There are two ways of thinking about new firms and how their contributions might vary:

- As equal in potential for contributions, with variations related to stage of development, technology, or differences in the special characteristics or situation of individual firms; or
- As different types, each with a distinctive or characteristic potential for contributions.

If the first model is useful, then it should be possible to identify those new firm characteristics associated with the level of development and, in turn, the level of contributions. Policies to promote economic growth could then focus on factors critical to the development of all firms.

The second model leads to the search for typologies of new firms and the relative contributions of each type. If accurate, it would provide information that would allow the identification of the types of new firms with the greatest potential for contributions. Programs could then target limited resources to those firms most likely to foster economic growth.

This chapter will begin with multifactor predictions of new firm contributions, based on data collected using the 1986 Minnesota New Firm Survey. This is presented as an "equipotential model" of new firms as sources of economic development. Analysis of this model is followed by a discussion of typologies of new firms based on, first, their developmental patterns; second, their export focus; and, third, a combination of the two. Implications for promoting regional economic growth are considered in the summary.

#### NEW FIRMS AS EQUIPOTENTIAL ECONOMIC ENTITIES

Attempting to predict the contributions of new firms, as economic entities with equivalent potential, is relatively straightforward. It involves the use of standard analysis procedures (correlations, multiple regression analysis) to determine which characteristics of individual new firms are related to current contributions (jobs, sales, and exports).

### Factors Associated with Contributions

The data collected in the 1986 Minnesota New Firm Survey have been consolidated into 142 variables that might be related to new firm contributions.<sup>1</sup> Measures of association between the complete list and the statistical significance of each factor are presented in Appendix F. The highest correlation is 0.60; the majority are statistically significant; and the patterns vary for different types of contributions (jobs, sales, and exports).

As a preliminary step, variables that had correlations of about 0.20<sup>2</sup> or higher for any one of the three types of contributions (jobs, sales, exports) were chosen for special attention. Then the attempt was made to include the most significant general factors developed from multiple-item inventories regarding conditions that might precede contributions: start-up problems, current management focus, and strategic (competitive) emphasis.<sup>3</sup> These variables are presented in Table 3.1.

The substantial variation from one column to the next is important. For example, variables highly correlated with jobs (first-year employment; low initial proportion of managers and professionals) are not those most highly correlated with sales (first-year sales, annual sales growth). This suggests that different factors and processes are related to the different contributions.

### Multivariate Prediction of Contributions

Virtually all the factors in Table 3.1 have statistically significant relationships with the contributions (jobs, sales, and exports). But this does not provide information on the importance or strength of the relationship or the predictions available from combinations of variables. These estimates require more sophisticated analyses, such as are provided by multiple regression procedures.

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<sup>1</sup> This includes responses to five multiple-item inventories: 20 local infrastructure characteristics; 43 start-up problems; 25 aspects of current management focus; 14 strategic or competitive emphasis; and reactions to 31 services that might be provided by local, regional, or state government agencies. They were consolidated into general dimensions using factor analysis techniques. Details are provided in Appendix E.

<sup>2</sup> Note that with such a large sample, virtually every correlation was statistically significant.

<sup>3</sup> The latter two, management emphasis and strategic focus, may not be causes of current contributions. Measured at the same time as contributions, they may be associated with variations in jobs, sales, and exports.



Table 3.1. SELECTED FACTORS RELATED TO NEW FIRM CONTRIBUTIONS

	Pearson Correlation with		
	1986 Jobs	1985 Sales	1985 Exports
Interest costs, % of total	-.10**	-.12**	-.19**
Taxes costs, % of total	-.15***	-.21***	-.12*
Sales within MN, 1985	.34***	.50***	.23***
Sales, adjoining MN, 1985	.23***	.33***	.47***
Sales, rest of U.S., 1985	.20***	.30***	.50***
Sales, abroad, 1985	.10**	.11***	.19***
Informal finan. resources: personal savings	.26***	.23***	.23***
Total informal financial resources	.32***	.30***	.30***
Start problems, av. severity: employees	.21***	.15**	.27**
Start problems, av. severity: financing	.19***	.17***	.29***
Start problems, av. severity: government	.23***	.20***	.34***
Infrastructure importance: labor	.32***	.21***	.02
Management focus: planning	-.21***	-.18***	-.21***
Management focus: marketing	-.15***	-.17***	-.24***
Management focus: prin. involvement	-.09*	-.12**	-.20**
Management focus: product/service	.02	.03	.20**
Management focus: experience	-.06	-.15***	-.19**
First-year employment	.33***	.30***	.28***
Average sales growth, all years	.30***	.47***	.45***
Average sales growth, third year	.41***	.54***	.48***
Size of the start team	.27***	.21***	.15***
Average number hours worked/week	.09**	.21***	.04
Age range of start team	.16***	.21***	.16***
Percent males on the start team	.08**	.21***	.23***
Percent start team working 50+ hours/week	.09**	.24***	.08
Av. interest, train/ed. programs	.31***	.18***	.12*
Av. interest, tech/growth programs	.24***	.19***	.31***
Av. interest, capital/financing programs	.22***	.18***	.19***
1st formal finan: work cap line of credit	.25***	.26***	.26***
1st formal finan: inventory term loans	.12***	.20***	.14***
1986 formal finan: work cap/line of credit	.17***	.18***	.17***
Count of start problems: products/markets	.19***	.17***	.13***
Count of start problems: employees	.37***	.32***	.37***
Count of start problems: planning	.22***	.10*	.11*
Count of start problems: financing	.22***	.24***	.27***
Count of start problems: government	.26***	.23***	.28***
Count of start problems: total	.35***	.33***	.30***
Start problems, partly solved: employees	.27***	.12**	.20***
Start problems, fully solved: financing	.12**	.21***	.05

Notes:

1. Low value indicates increased emphasis.
2. Statistical significance: \*  $0.01 < p < 0.05$ ; \*\*  $0.000 < p < 0.01$ ; \*\*\*  $p < 0.000$
3. All correlations are based on normally distributed log 10 transformations of jobs, sales, or exports.

For the multiple regression analysis, the variables listed in Table 3.1 were supplemented with three that indicated the presence or absence of a characteristic: starting out as a corporation, gestation period starting with sales, and gestation period starting with hiring.<sup>4</sup>

As the emphasis is on predicting future contributions of new firms, variables were chosen that would reflect their situation or status in the first one to two years of start-up. That is, a variable like "fourth-year sales" was not used to predict "1985 sales," for "1985 sales" would be the "fourth-, fifth-, or sixth-year sales" for a proportion of the sample.

A standard multiple regression using a stepwise procedure was utilized for the analysis.<sup>5</sup> The procedure adds, tests, and subtracts variables in an attempt to find the smallest set of variables that will have the greatest predictive power. The procedure is designed to retain only those variables that make a statistically significant contribution to the prediction (of jobs or sales or exports, as the case may be). The omission of variables is often as significant as their inclusion.

The major factors included in the regression analysis for the three predictive equations are presented in Table 3.2. "Std Beta" refers to the weights adopted by the procedure for the best possible predictions of, in this case, the jobs, sales, and exports of the new firms. A larger "beta weight" (ignoring the sign) indicates that the factor has a larger independent influence on the contribution (jobs, sales, and exports). Only variables that would improve the predictions are listed; exclusion implies it did not provide a statistically significant increase in predictive power.<sup>6</sup>

One indication that critical predictive variables have been included in the analysis is a high multiple correlation and estimate of explained variance. In this case the results are quite encouraging. The percentage of explained variance for the three measures of social contributions are as follows:<sup>7</sup>

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<sup>4</sup> The period of time in which major start-up events occurred was called the gestation period. It could be initiated by any of four events: personal commitment by the start-up team members, formal financial support, sales, or hiring. The gestation period averaged six months, but ranged from one to over sixty months.

<sup>5</sup> "Regression," Chapter 35 in SPSS, Inc., User's Guide: SPSS-X, 2nd ed. (New York: McGraw-Hill, 1986).

<sup>6</sup> The log transformations of the contributions (jobs, sales, and exports) were normally distributed and used as dependent variables for the analysis. There were no significant departures from normality among the residuals. The required assumptions for high confidence in the results appear to have been met.

<sup>7</sup> Note, however, that only (?) 342 firms with any exports are included in the last regression, excluding (?) 75 percent of the firms in the sample.

	<u>Total Firms in Analysis</u>	<u>Multiple Correlation</u>	<u>Variance Explained (%)</u>
Jobs	1,101	0.74	55
Sales	917	0.65	42
Exports	301	0.65	42

This high explained variance suggests it is possible to have confidence that the most important of the 142 variables were among those selected for the multiple regression. From these 42 most important variables, only 10 were included in the prediction of sales; 10 in the prediction of jobs; and 4 in the prediction of exports. It also suggests that it is unlikely that critical variables have been omitted.

Table 3.2. MULTIVARIATE FACTORS PREDICTING CONTRIBUTIONS

	<u>Std Beta</u>	<u>Variable Change to Increase Contribution</u>
1986 Jobs		
PROFFP	-0.228	Proportion of managers, professionals first year
ISUPT	0.277	Total start-up problems solved
VB9	0.184	Total informal, prestart financing
XOF15	0.632	Total employment in first year
NOSKLG	-0.471	Proportion of current employees unskilled
MF2	-0.156 <sup>a</sup>	Current management focus on marketing
IMP4	0.171	Infrastructure importance of labor
USAMT	0.165	1985 sales outside of Minnesota
ASALGR1	-0.189	Average sales growth years 1-2
VIN1	0.160	Initial formal working capital loan
1985 Sales		
ASALGR1	0.188	Average sales growth years 1-2
ISUP2	0.194	Count of major start-up problems with employees
BV9	0.190	Total informal, prestart financing
HARDWK	0.122	Percentage start-up team working 40-60 hours/week
PFS4	0.189	Percentage of financial start-up problems solved
BOYPC	0.141	Percentage of males on start-up team
PCMAT	0.146	Percentage of material costs
IMP4	0.141	Infrastructure importance of labor
ISUR4	0.133	Count of major start-up problems with financing
YR1R	0.129	First-year sales
1985 Exports		
YR1R	0.332	First-year sales
SAMPSIC2	0.303	Manufacturing, distributive, or business service industry
ISUP2	0.257	Count of major start-up problems with employees
SUP9	0.248	Average severity local government start-up problems

<sup>a</sup> Lower value indicates increased emphasis.

Providing interpretations as to why each variable might be important in increasing jobs, sales, or exports is an interesting and complex challenge. For current jobs provided, measures of the initial size of the firm (first-year employment, total informal financing, initial working capital loan) as well as the growth pattern (average sales growth in first year) are useful predictors. Others involve the number of start-up problems (and the extent to which they are solved) and some indication of the new firm's structure (fewer managers, staff professionals the first year), as well as the firm's management emphasis (on marketing), concerns (with the local labor supply), and the scope of the market for its goods and services (nationwide).

For current sales, both first-year sales and average sales growth in the first year are of significance. Higher sales are associated with more concerns with personnel (major start-up problems with employees, increased importance of local labor supply) and financing (start-up problems with financing, amount of initial informal financing). The start-up teams are dominated by males and have a high level of work involvement (forty to sixty hours per week).<sup>8</sup>

Analysis of the factors associated with exports is more restricted, for only 27 percent of the new firms report out-of-state exports in 1985. Nonetheless, only four variables have a significant impact on the predictions: the average first-year sales and one major class of start-up problems (initial problems with employees and labor). A critical factor is the industry of the new firm. Being in an export-oriented industry--manufacturing, distributive service, or business service--is significant, as are reports of start-up problems involving local government (which includes concerns regarding liability insurance and coping with government regulations).

These predictive variables are marked by an absence of factors that could be affected--either easily or at all--through public policy or programs. The need for suitable personnel (which might be affected by appropriate public education and training programs) and problems with financial support both appear as predictive variables, but their predictive influence is modest compared to the other variables. This encourages other ways of thinking about new firms and their contributions.

#### DEVELOPMENT TYPES OF NEW FIRMS

If all new firms were similar, varying only in development or maturity, any number of factors might be correlated with "growth" and contributions. Age is among the most obvious; it seems reasonable to expect older firms to be larger and make greater contributions. Further, age should be most significant in the early development of new firms, when their contributions might easily double or triple in a few years. Despite this restriction on the range of ages--the oldest firms had their first sales in 1979, six years before 1985--the range is great enough for analysis.

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<sup>8</sup> But not an extremely high work involvement, more than sixty hours per week.

Age does not have a dramatic relation to the growth and contributions of new firms however. The correlation of firm age with jobs is 0.06; sales, 0.12; and exports, 0.02. Although age-jobs and age-sales correlations are statistically significant, the proportion of total variance accounted for by age is 1 percent or less. *The age of a new firm does not help predict its contributions in jobs, sales, and exports.*

#### Four Development Types

A different perspective on new firm contributions is to identify specific types of new firms and consider their individual features. One strategy for classifying new firms is to examine developmental patterns, focusing on two aspects: initial sales (high and low) and average annual growth (high and low).<sup>9</sup> Specifically:

- Start-up year sales: Classifying firms as starting with high or low first-year sales (at least \$250,000; or less than \$250,000).
- Annual sales growth: Classifying firms as slow or fast growing (average annual growth of more or less than \$100,000 per year).

The result is a fourfold classification of new firms as presented in Table 3.3.<sup>10</sup>

Table 3.3. DEVELOPMENT TYPES OF NEW FIRMS, IN PERCENTS (N = 676)

	Average Annual Sales Growth (first year to 1985)		Totals
	Low	High	
	(< \$100,000)	(> \$100,000)	
First-year sales (start-up year)			
High: \$250,000 or more	7	10	17
Low: Less than \$250,000	66	17	83
Total	73	27	100

Two-thirds of the new firms have low first-year sales and low annual growth. About one in four has high annual growth, with the greater proportion

<sup>9</sup> Average annual growth is highly correlated, in excess of 0.80, with compound annual growth rates.

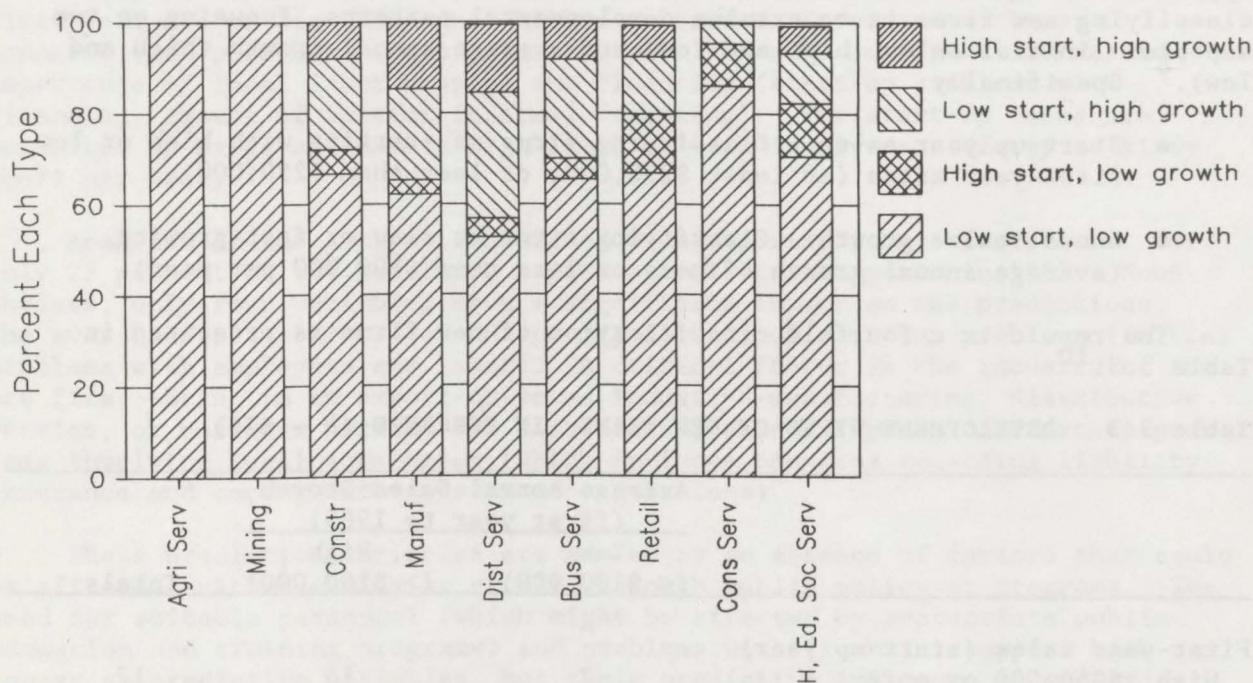
<sup>10</sup> These divisions are used for several reasons: they are just past the average value for each distribution; they are easy to remember and discuss; they were used in two other studies (1984 in Minnesota; 1986 in Pennsylvania) and thus facilitate comparison. However, this phenomenon is quite robust, and minor changes in the cut points would not affect the major patterns.



of high-growth firms coming from low-start firms. The smallest proportion of firms (one in fourteen) have high initial sales and low annual growth.

The distribution of these firms across industry sectors is presented in Figure 3.1. Low-start, low-growth firms are the most common type of new firm in every industry sector.<sup>11</sup> It is true, however, that low-start, low-growth new firms are less prevalent in manufacturing, distributive services, and construction than in other industries.

Figure 3.1. Development Type by Industry, 1979-84



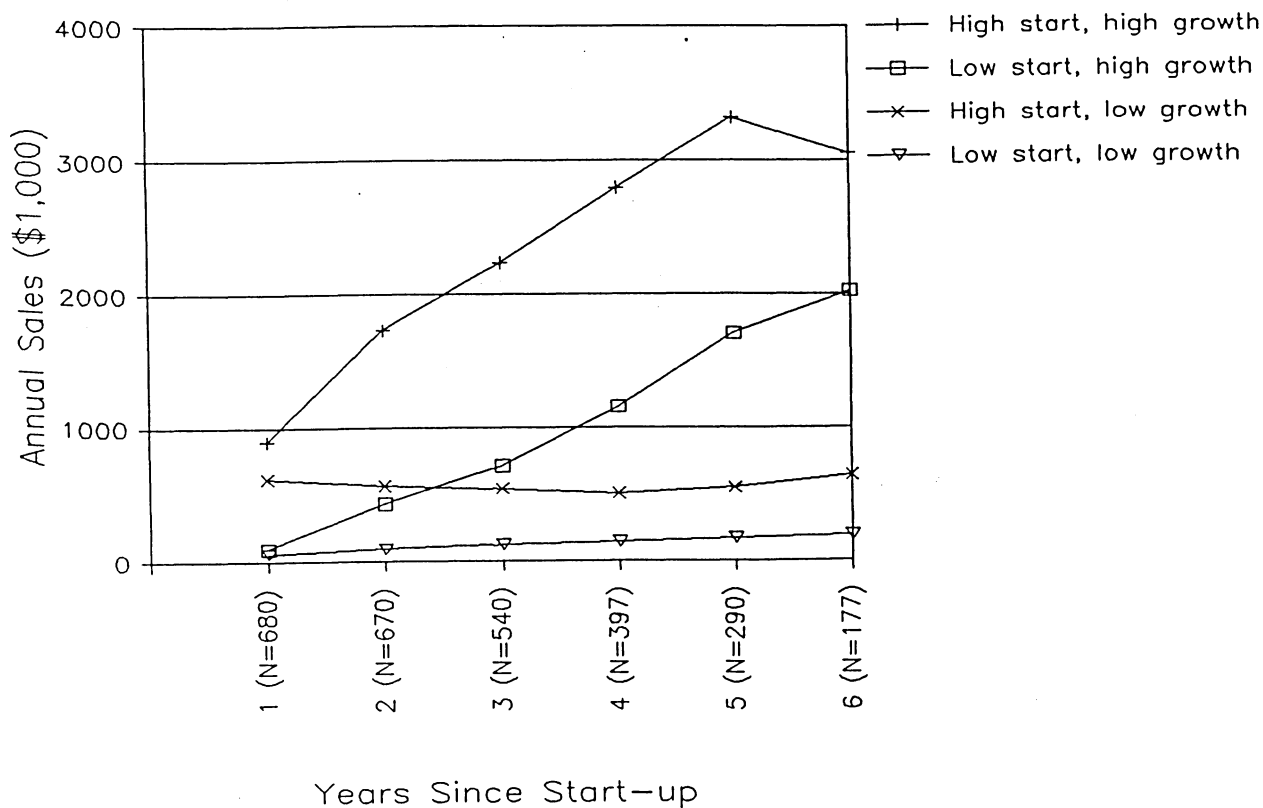
#### Development Type and Sales History

The purpose of this typology was to determine if there were some useful way to predict the developmental pattern or sales histories of new firms. Sales histories are presented in Figure 3.2.<sup>12</sup> The dramatic differences between the low-start-up, low-growth new firms and the high-growth new firms suggest that this typology has some value.

<sup>11</sup> The small number of agriculture and mining firms, less than ten, is inadequate for much confidence in the patterns for these industries.

<sup>12</sup> The number of firms available for the analysis drops steadily from the youngest to the oldest new firms. The number of firms of each age is indicated along the bottom axis.

Figure 3.2. DEVELOPMENT TYPE AND SALES HISTORY, 1979-84



Development Type and Contributions

The average 1985-86 contributions associated with the four developmental types are presented in Table 3.4. The average high-start, high-growth firm provides five times the jobs, twenty-one times the sales, and forty-two times the exports of the average low-start, low-growth firm.

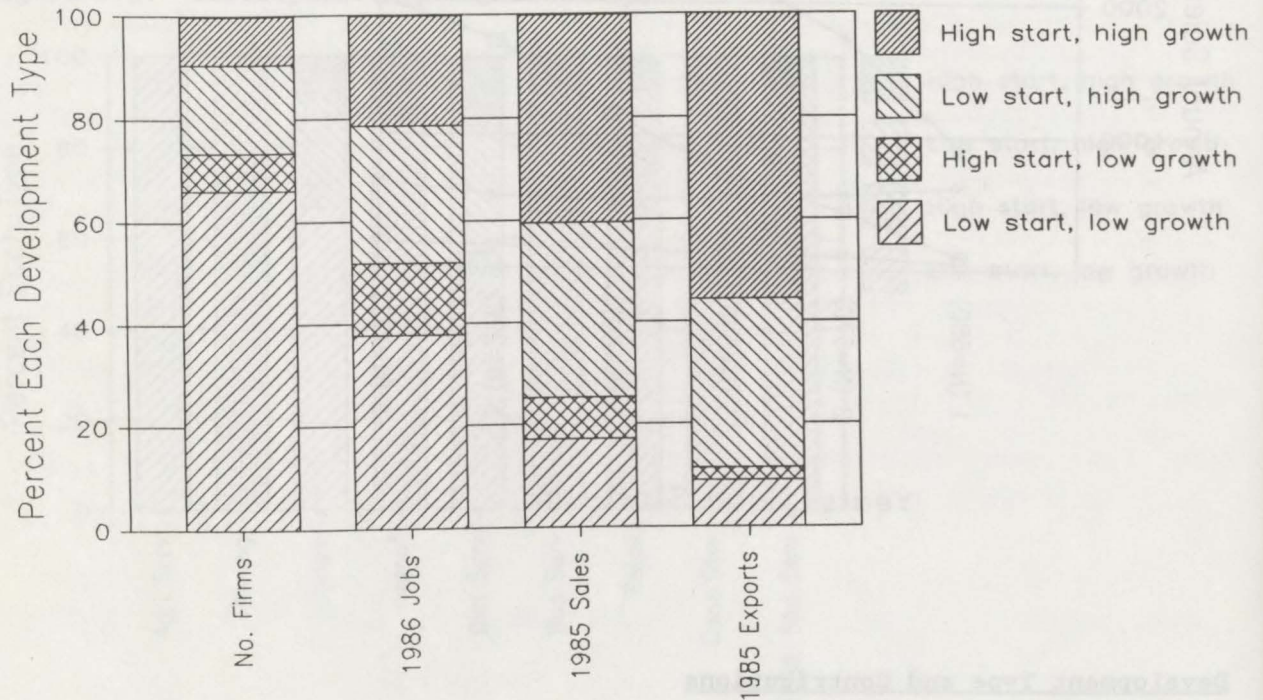
Table 3.4. DEVELOPMENT TYPE AND AVERAGE CONTRIBUTIONS, 1985-86

	1986 Jobs	1985 Sales (\$1,000)	1985 Exports (\$1,000)
High start, high growth	26.3	3,152	716
Low start, high growth	14.2	1,144	238
High start, low growth	24.9	662	44
Low start, low growth	5.3	150	17



As only a minority of new firms have high-growth developmental patterns, it is possible their total contributions are small. The total contributions of the different types of new firms in the sample are presented in Figure 3.3. Fast-growing new firms--24 percent of all new firms--are responsible for 80 percent of sales and exports and 60 percent of the jobs provided by new firms. Because this sample is representative of all new firms emerging in Minnesota, confidence that this pattern would be found in all new firms should be high.

Figure 3.3. DEVELOPMENT TYPE AND TOTAL CONTRIBUTIONS, 1985-86



Development Type and Minnesota Region

The occurrence of the different types of new firms in the thirteen regions of Minnesota is presented in Figure 3.4A. While some high-growth firms are present in every region, they are more prevalent in Region 11. As described in Chapter 2, this is the same region with a higher birth rate of firms in export potential industries (manufacturing, distributive services, and business services). (This is discussed further in sections C and D of this chapter.)

The proportion of new firms of each type emerging within each region is presented in Figure 3.4B. Low-start-up, low-growth new firms account for more than half of the new firms in every region, yet high-growth firms are also found in many of these regions. Only Region 2 (Headwaters) has no high-growth new firms in this sample. Across regions, the percentage of high-growth (low or high start-up) new firms varies from zero to 44 percent.



Figure 3.4A. DEVELOPMENT TYPE BY MINNESOTA REGION, AS OF 1986

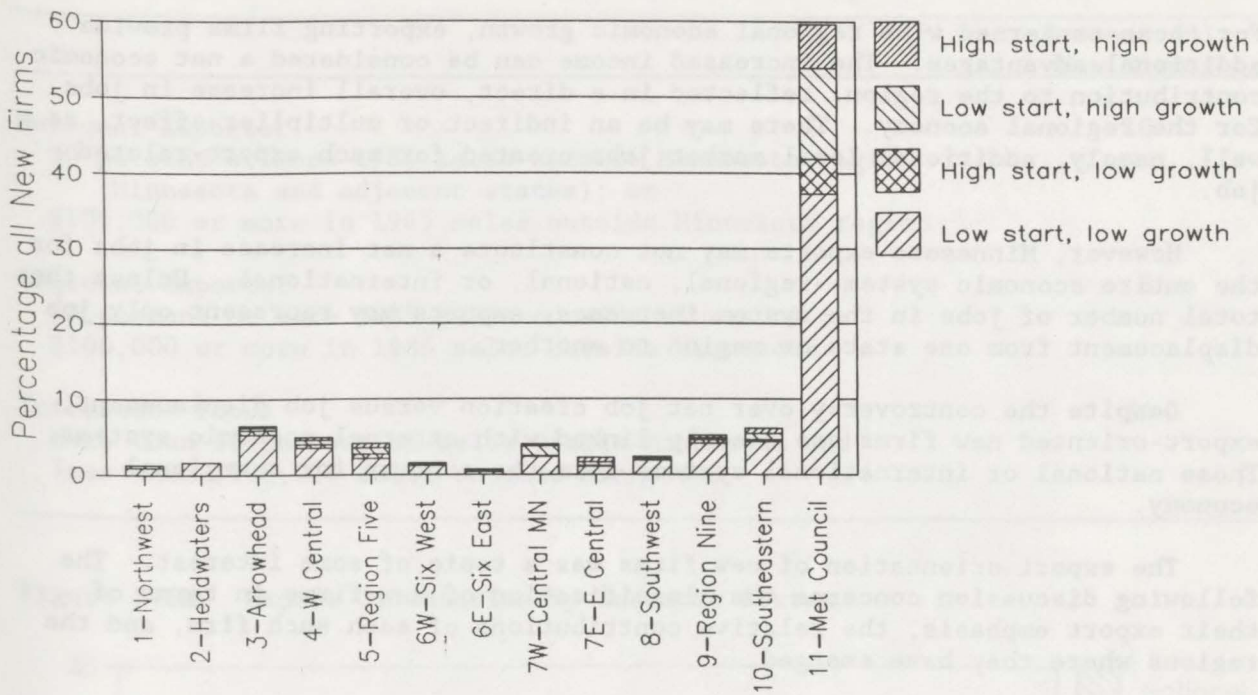
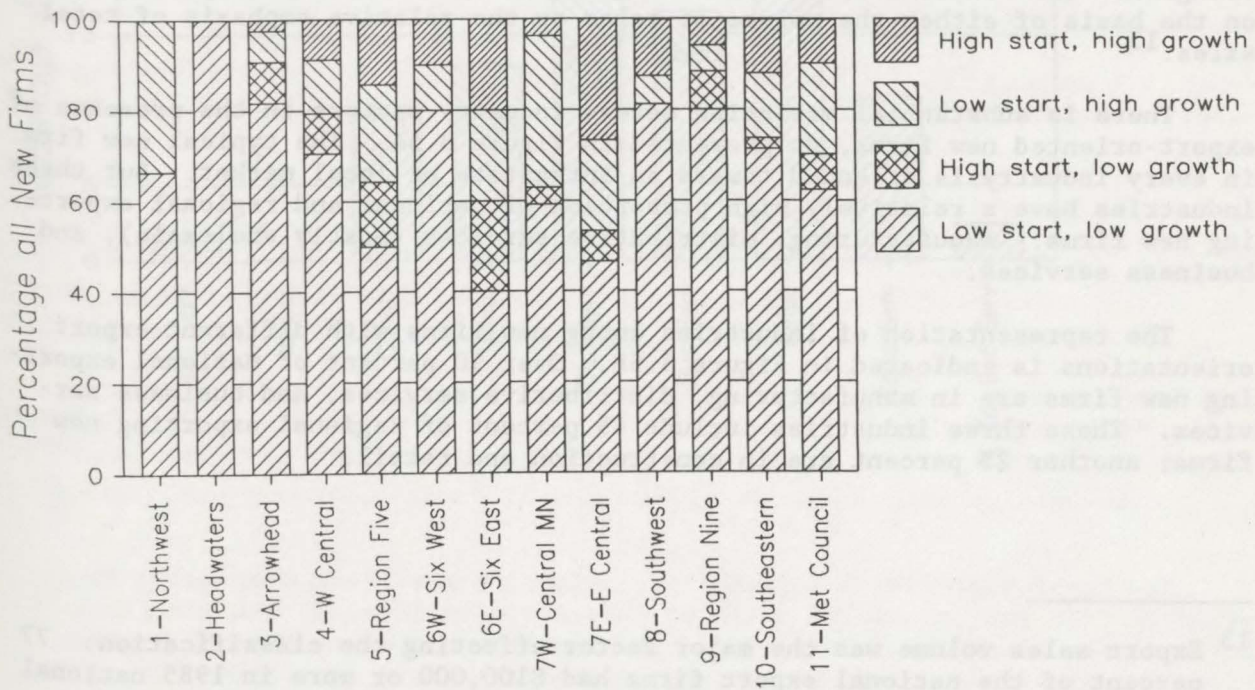


Figure 3.4B. DEVELOPMENT TYPE WITHIN MINNESOTA REGION, AS OF 1986



## EXPORT FOCUS OF NEW FIRMS

For those concerned with regional economic growth, exporting firms provide additional advantages. The increased income can be considered a net economic contribution to the region, reflected in a direct, overall increase in jobs for the regional economy. There may be an indirect or multiplier effect, as well, namely, additional local market jobs created for each export-related job.

However, Minnesota exports may not constitute a net increase in jobs for the entire economic system--regional, national, or international. Unless the total number of jobs in the system increases, exports may represent only job displacement from one state or region to another.

Despite the controversy over net job creation versus job displacement, export-oriented new firms are clearly linked with external economic systems. Those national or international systems form the context for a regional economy.

The export orientation of new firms was a topic of some interest. The following discussion concerns the classification of new firms in terms of their export emphasis, the relative contributions of each such firm, and the regions where they have emerged.

### Three Export Foci

The new firms were classified on the basis of their exports into one of three categories (see Table 3.5). In essence, a firm could be in an export category on the basis of either the volume of sales or the relative emphasis of total sales.<sup>13</sup>

There is substantial variation across industry sectors in the presence of export-oriented new firms, as presented in Figure 3.5A. The typical new firm in every industry is oriented toward an intrastate or local market. But three industries have a relatively high proportion of national and regional exporting new firms: manufacturing, distributive services (mostly wholesale), and business services.

The representation of industries among new firms with different export orientations is indicated in Figure 3.5B. Over 90 percent of national exporting new firms are in manufacturing, distributive services, and business services. These three industries include 65 percent of regional exporting new firms; another 25 percent are in construction and retail.

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<sup>13</sup> Export sales volume was the major factor affecting the classification: 77 percent of the national export firms had \$100,000 or more in 1985 national sales and 77 percent of the regional export firms had \$100,000 in 1985 regional sales.

Table 3.5. TYPES OF EXPORT FOCI

	Percent All New Firms
National Exporter 50 percent or more 1985 sales outside Minnesota region (Minnesota and adjacent states); or \$100,000 or more in 1985 sales outside Minnesota region	10
Regional Exporter 50 percent or more 1985 sales outside Minnesota or \$100,000 or more in 1985 sales outside Minnesota	6
Intrastate Focus More than 50 percent of sales within Minnesota and less than \$100,000 sales outside Minnesota	84

Figure 3.5A. Export Orientation by Industry Sector

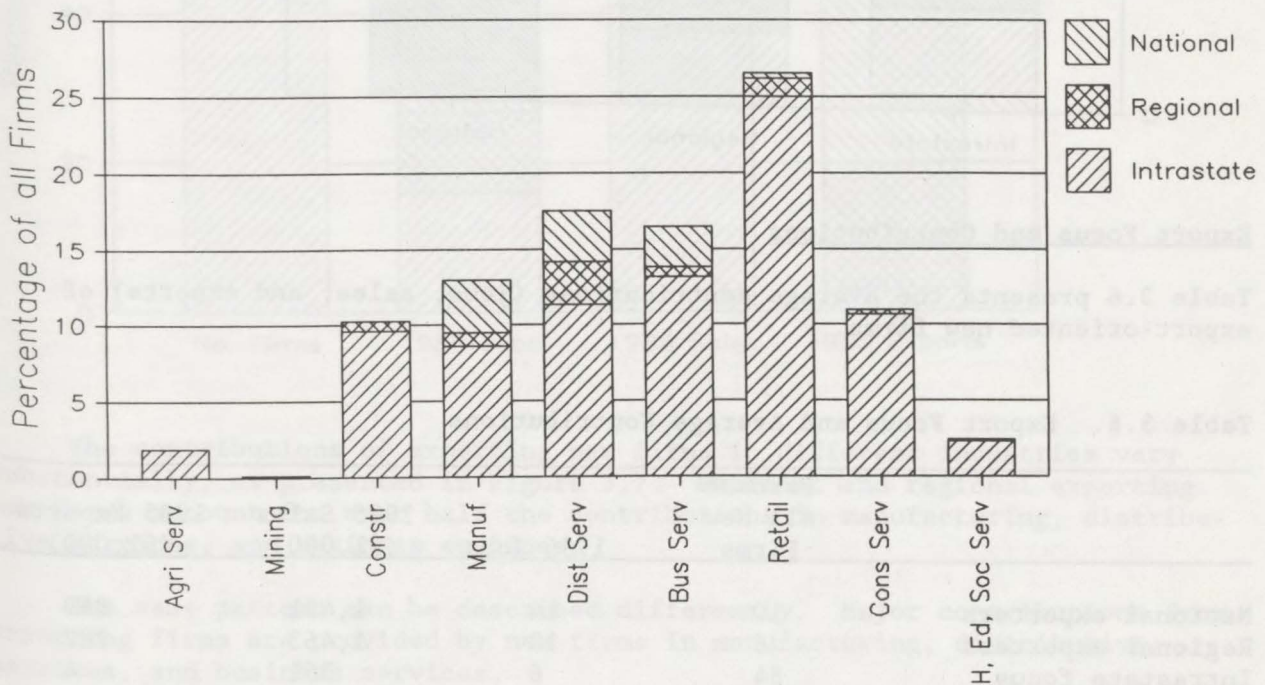
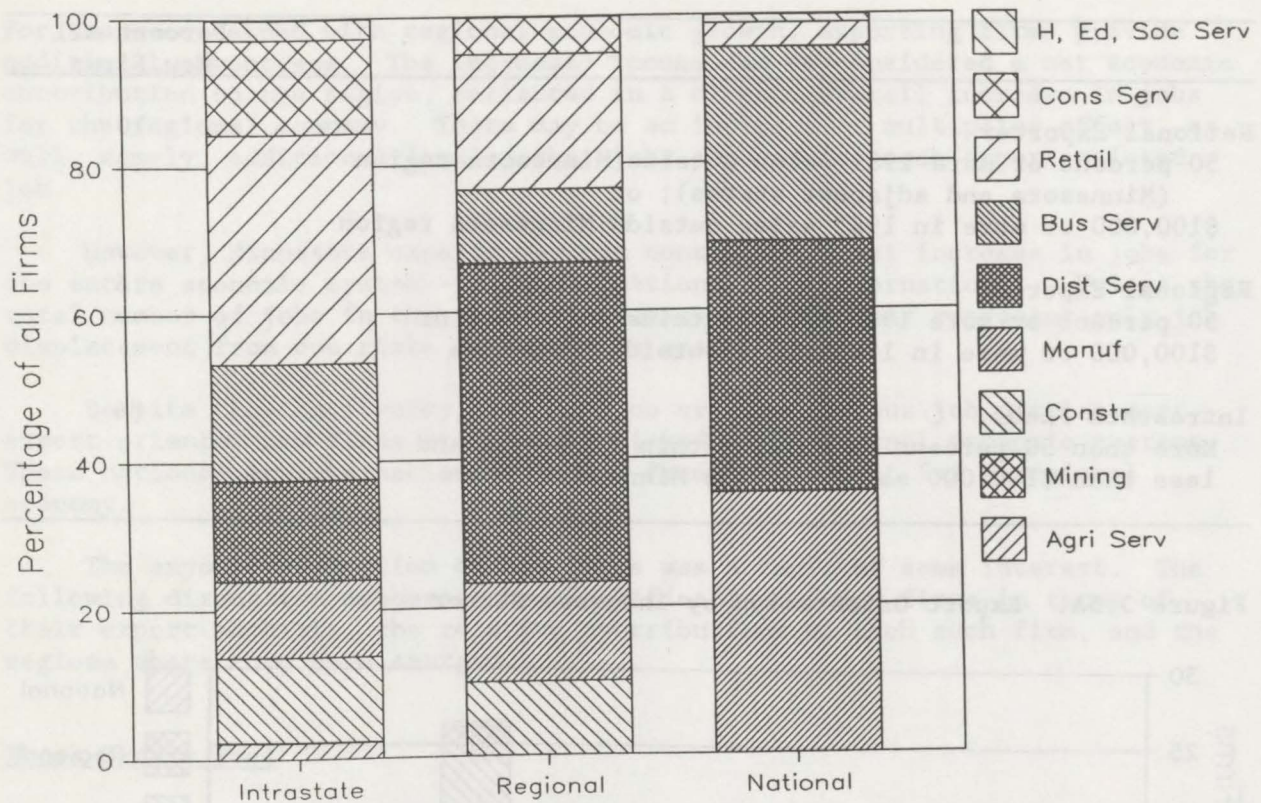




Figure 3.5B. MINNESOTA NEW FIRMS: EXPORT STATUS BY INDUSTRY SECTOR



**Export Focus and Contributions**

Table 3.6 presents the average contributions (jobs, sales, and exports) of export-oriented new firms.

Table 3.6. Export Focus and Average Contributions

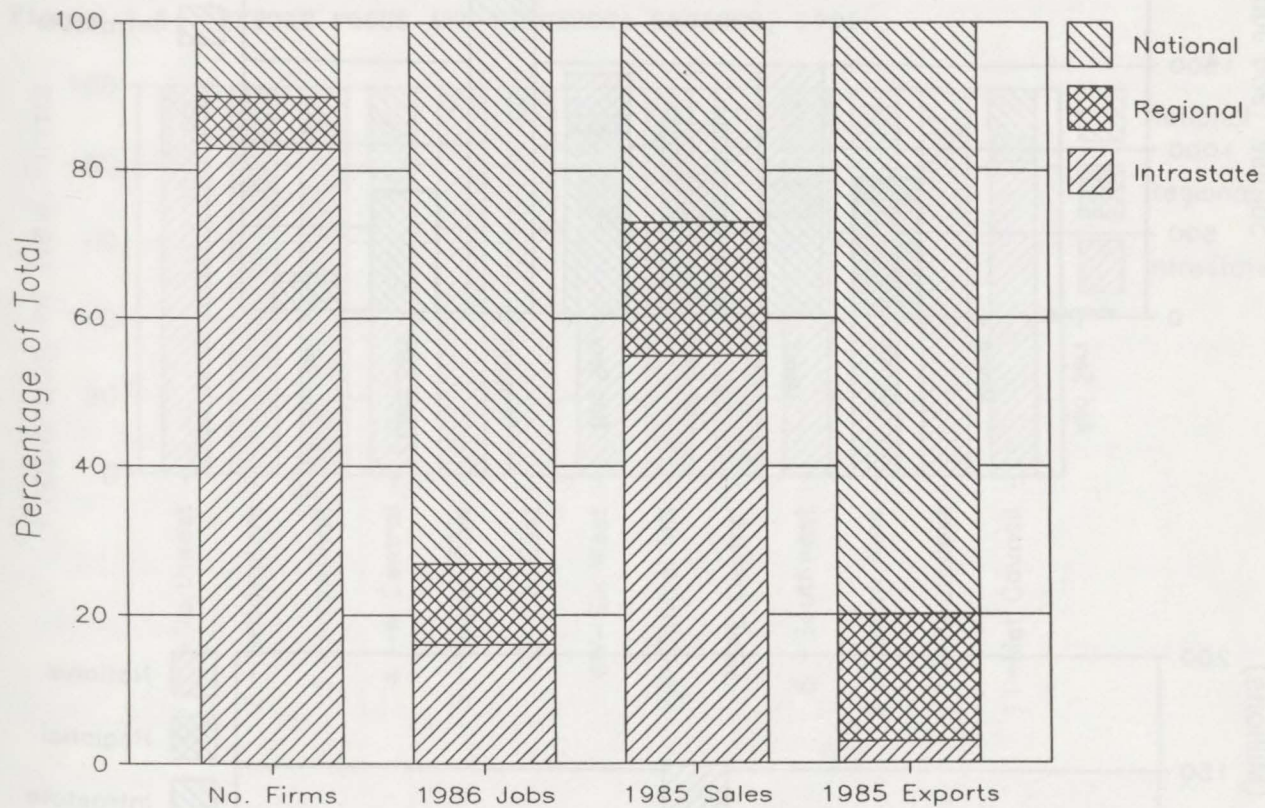
	Percent All New Firms	1986 Jobs	1985 Sales (\$1,000)	1985 Exports (\$1,000)
National exporters	10	14	1,451	849
Regional exporters	6	13	1,463	282
Intrastate focus	84	6	361	4

New firms targeting a regional or national market have over twice the employees and four times the sales of intrastate or local market new firms. National exporting firms have over three times the total exports of regional exporting new firms. Because of the way the firms were classified, it is to be expected that the average exports of intrastate new firms are almost nil.



The total contributions of new firms with different export orientations are presented in Figure 3.6. Although export-oriented new firms make up only 16 percent of all new firms, they account for 45 percent of total sales, 27 percent of new jobs, and--to be expected--97 percent of all exports.

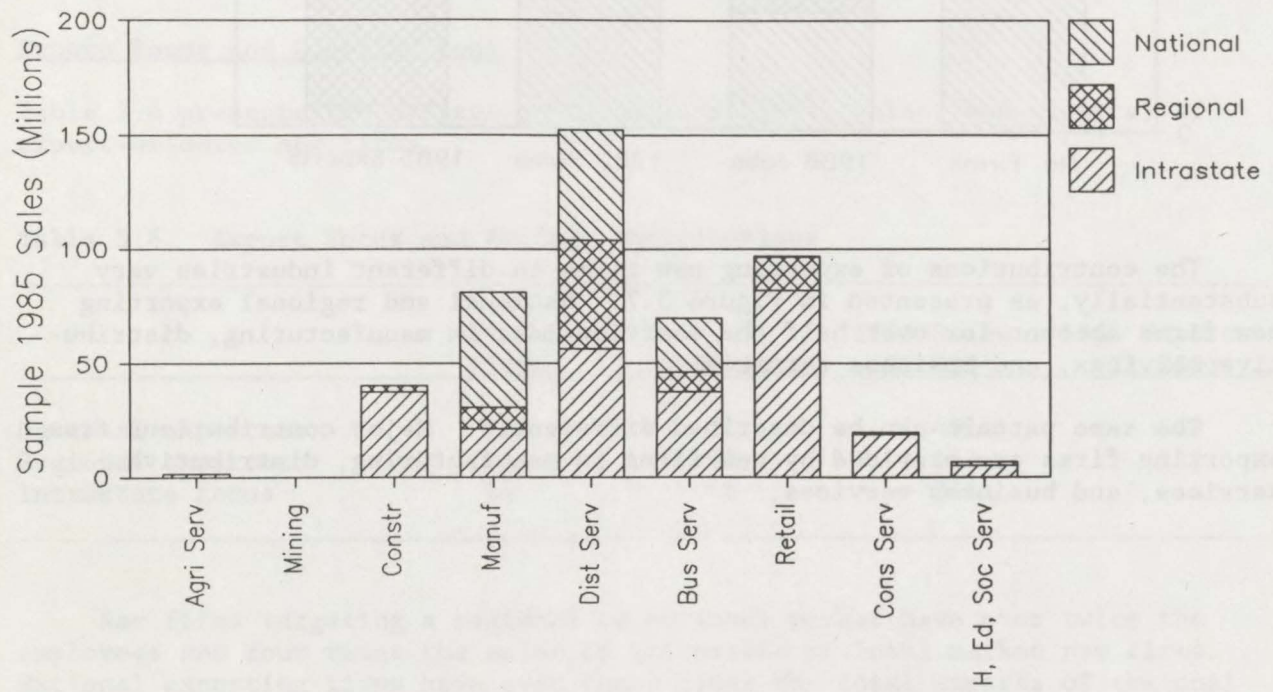
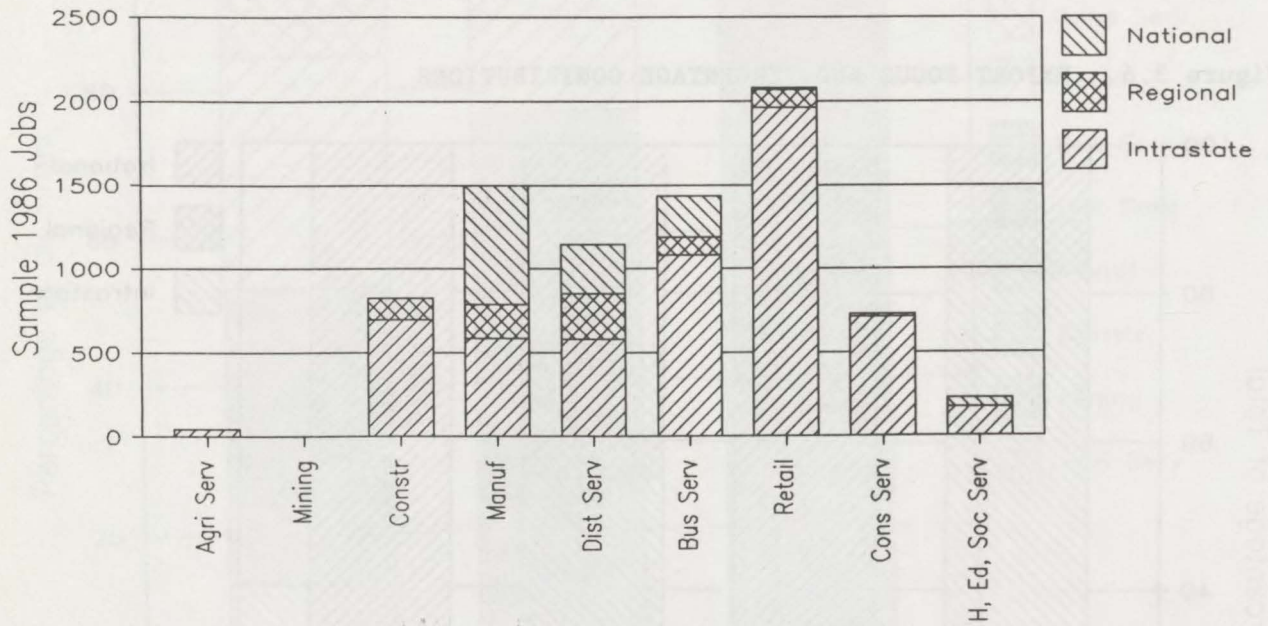
Figure 3.6. EXPORT FOCUS AND PERCENTAGE CONTRIBUTIONS



The contributions of exporting new firms in different industries vary substantially, as presented in Figure 3.7. National and regional exporting new firms account for over half the contributions in manufacturing, distributive services, and business services.

The same pattern can be described differently. Major contributions from exporting firms are provided by new firms in manufacturing, distributive services, and business services.

Figure 3.7. EXPORT FOCUS AND TOTAL CONTRIBUTIONS

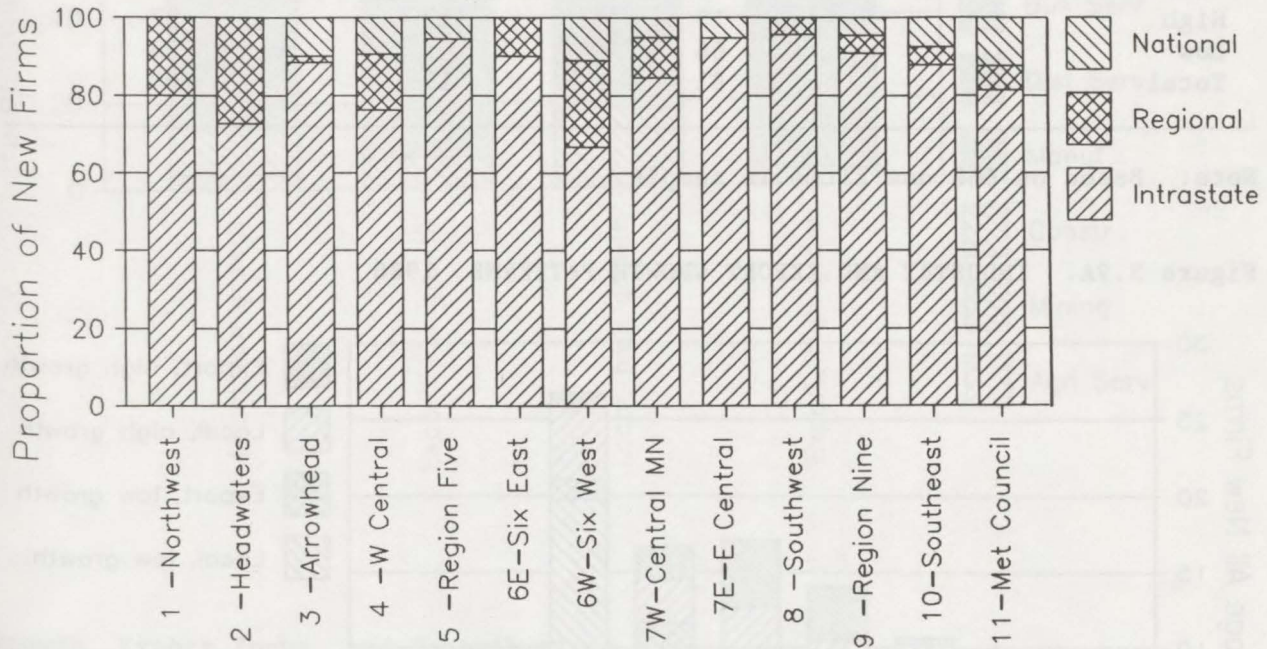




Export Focus and Minnesota Regions

The emergence pattern of new firms, including those that export, varies across the thirteen regions of Minnesota (see Figure 3.8). The majority of export-oriented new firms are concentrated in a few regions with over 60 percent of all exporting new firms emerging in the Twin Cities metropolitan area.

Figure 3.8. EXPORT FOCUS AND MINNESOTA REGIONS, 1986



GROWTH AND EXPORT FOCUS OF NEW FIRMS

Both export status and growth (development) patterns are associated with greater average and total new firm contributions. It is of some importance to determine the extent to which these are the same firms. Analysis of this issue starts with a two-way classification of new firms: by annual sales growth (high vs. low) and export focus (all exporting vs. local market).<sup>14</sup> The resulting distribution is presented in Table 3.7.

The typical new firm (66 percent of the sample), has a low annual growth and is oriented toward local markets. Over half of the high-growth new firms also concentrate on local markets. Of the exporting new firms, however, two-thirds are high growth (12 percent of all new firms are high-growth exporters). Low-growth exporters account for only 7 percent (roughly one in fourteen) of new firms.

<sup>14</sup> The classification schemes are the same as those presented in Tables 3.3 and 3.5.

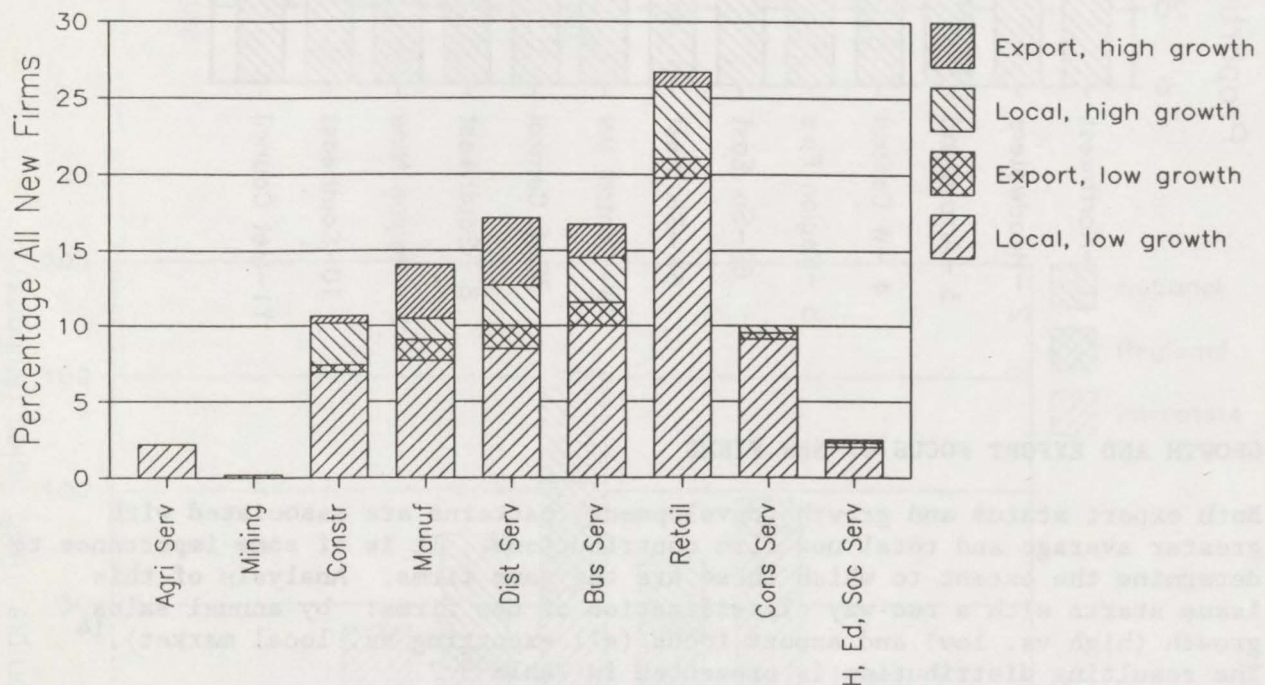
The relationship of export-growth patterns to industry is presented in Figure 3.9A and B.

Table 3.7 GROWTH PATTERNS AND EXPORT FOCUS, IN 1986 (IN PERCENTS)

Growth pattern	SALES DESTINATIONS		
	Local Markets	Out of State	Total
High	15	12	27
Low	66	7	73
Total	81	19	100

Note: Based on 648 new firms in sample.

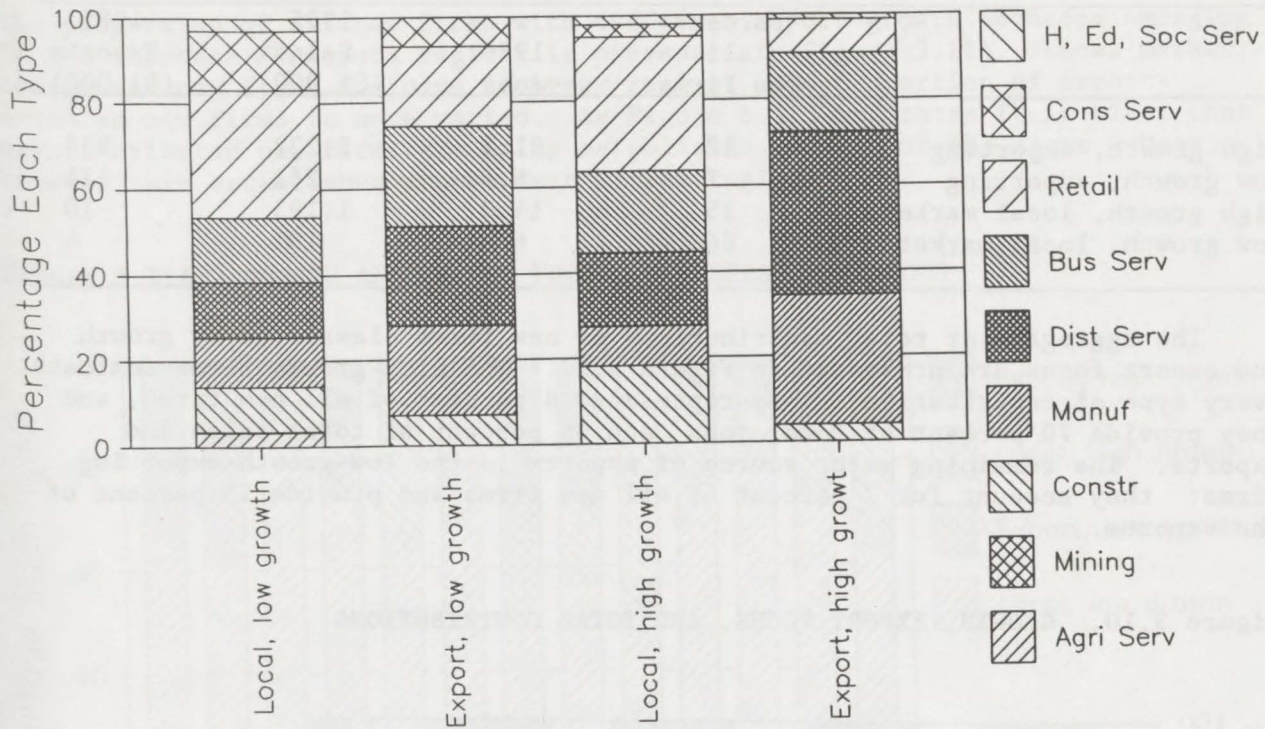
Figure 3.9A. INDUSTRY AND EXPORT GROWTH PATTERNS, 1986



The Figure 3.9A indicates, as might be expected, that low-growth, local-market new firms are dominant in three major industries (retail, consumer services, and construction); slightly more than half in business services; and less than half in the combination of manufacturing and distributive services. Figure 3.9B indicates that 90 percent of high-growth exporting new firms come from three industries (manufacturing, distributive services, and business services). However, among high-growth new firms (local market or exporting), five of the major industries are well represented (there are few from consumer or health, education, and social services).



Figure 3.9B. GROWTH, EXPORT FOCUS, AND INDUSTRY, 1986



Growth, Export Focus, and Contributions

The average contribution for each growth-export type is presented in Table 3.8. The low-growth, local-market new firms have substantially smaller average contributions. The major differences in average jobs and sales are between the high- and low-growth categories, rather than the difference in export orientations. The average 1986 jobs and 1985 sales for high-growth new firms are 18 and \$1,732,000 respectively; for low-growth new firms the averages are 6 and \$227,000.<sup>15</sup> Low-growth exporting new firms account for substantially greater average 1985 exports than other low-growth new firms (\$171,000 vs. \$4,000), but average 1986 jobs and 1985 sales are comparable to those of other low-growth new firms.

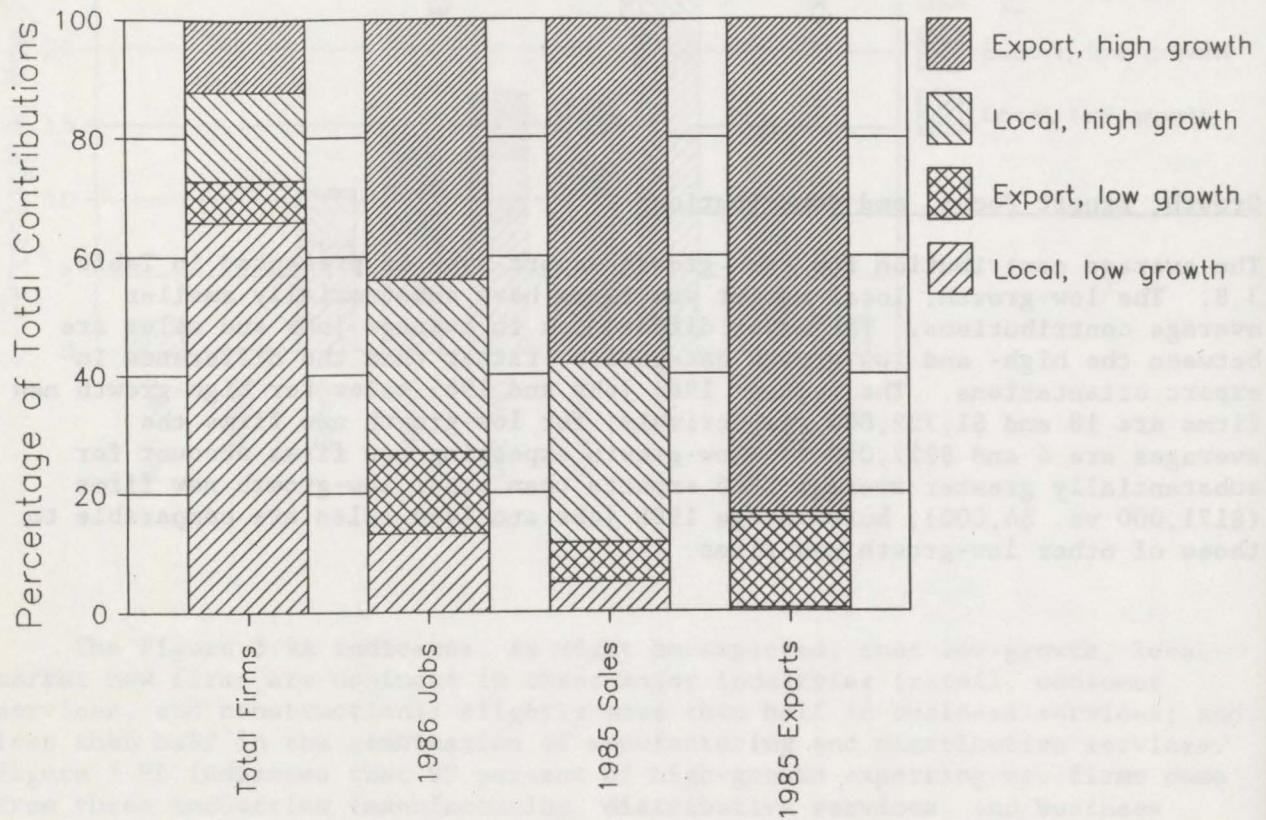
<sup>15</sup> Based on the average of categories, not weighted by the number of firms.

Table 3.8. Growth, Export Focus, and Average Contributions

	Percent all New Firms	1986 Jobs	1985 Sales (\$1,000)	1985 Exports (\$1,000)
High growth, exporting	12	21.1	2,272	933
Low growth, exporting	7	6.5	261	171
High growth, local market	15	14.0	1,193	10
Low growth, local market	66	6.4	192	4

The aggregate or total contributions of new firms classified by growth and export focus are presented in Figure 3.10. The high-growth firms dominate every type of contribution: they represent 28 percent of all new firms, and they provide 70 percent of total jobs, and 85 percent of total sales and exports. The remaining major source of exports is the low-growth exporting firms: they account for 7 percent of all new firms and provide 15 percent of the exports.

Figure 3.10. GROWTH, EXPORT FOCUS, AND TOTAL CONTRIBUTIONS





Growth, Export Focus, and Minnesota Regions

The proportion of all new firms with different export-growth emphases emerging in the thirteen Minnesota regions is presented in Figure 3.11A. Local market, low-growth new firms dominate in every region. The proportion of export-oriented new firms is more varied. As Figure 3.11B indicates it is clear that export-oriented new firms are being established throughout the state. Most, however, are established in the Twin Cities region.

Figure 3.11A. GROWTH AND EXPORT FOCUS BY MINNESOTA REGIONS

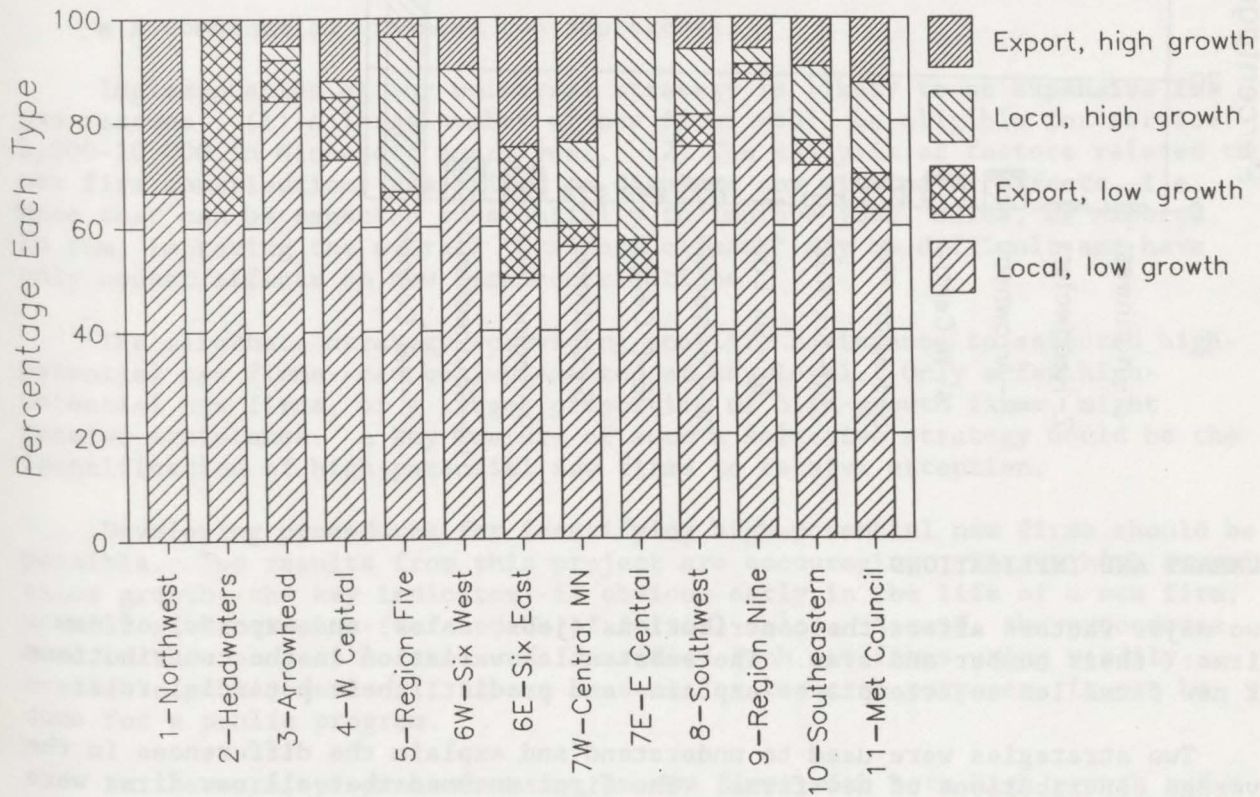
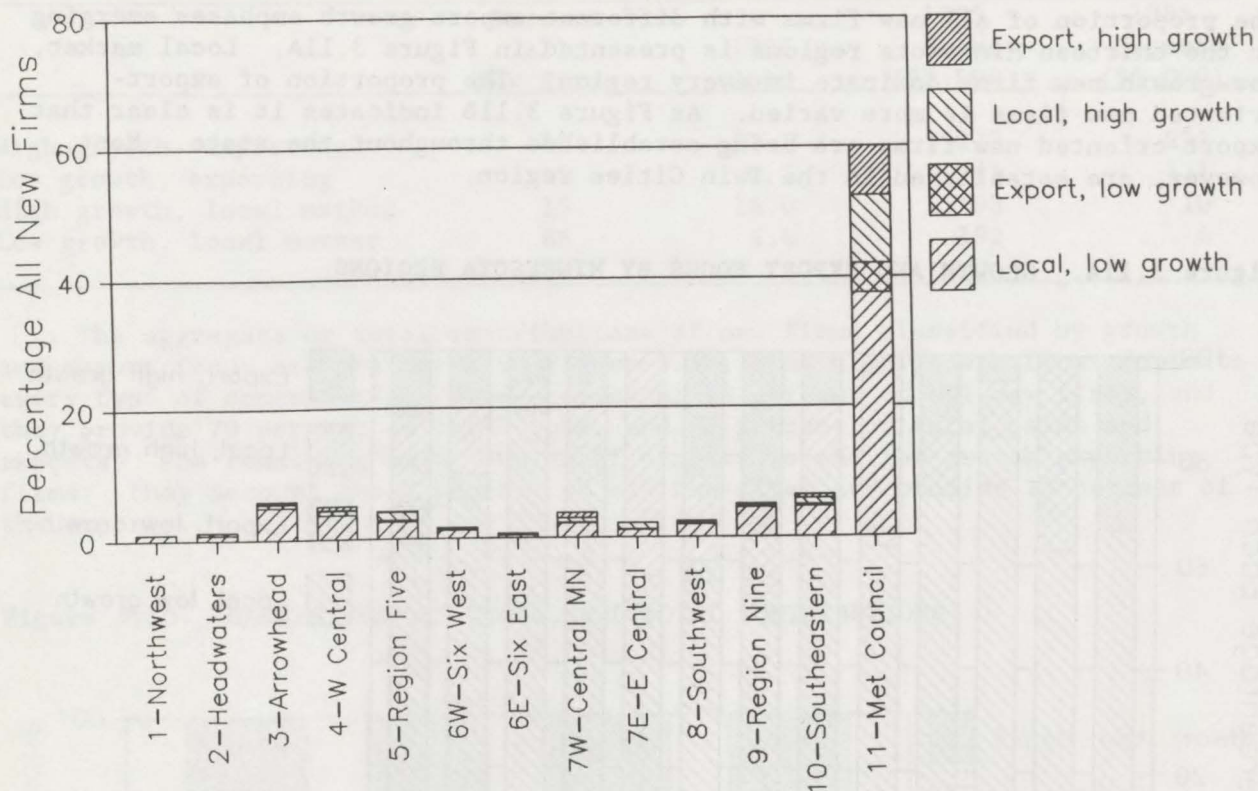




Figure 3.11B. ALL MINNESOTA NEW FIRMS BY GROWTH AND EXPORT FOCUS



### SUMMARY AND IMPLICATIONS

Two major factors affect the contributions (jobs, sales, and exports) of new firms: their number and size. The substantial variation in the contributions of new firms led to attempts to explain, and predict, their potential roles.

Two strategies were used to understand and explain the differences in the average contributions of new firms. The first assumed that all new firms were equal in their potential. It involved attention to a number of variables (142, reduced to 42) considered useful for predicting variations in jobs, sales, and exports. While the capacity to predict variation in jobs and sales was high, the number of variables was large and few seemed obvious candidates for a policy intervention that would have a major impact.

The second strategy was to classify new firms in terms of critical characteristics: developmental patterns (average annual sales growth) and export orientation (emphasis on out-of-state sales). The results were quite striking, for the average high-growth new firm was substantially larger than the average low-growth new firm, and, of even more significance, they were responsible for the majority of all contributions. About two-thirds of the high-growth new firms were export oriented, and accounted for four-fifths of all exports.

A larger percentage of high-growth and export-oriented new firms emerged in the major urban region, the Minneapolis-St. Paul metropolitan area. However, a number of high-growth and export-oriented new firms have emerged throughout the state.

Policy strategies for enhancing new firms and, in turn, economic development would include:

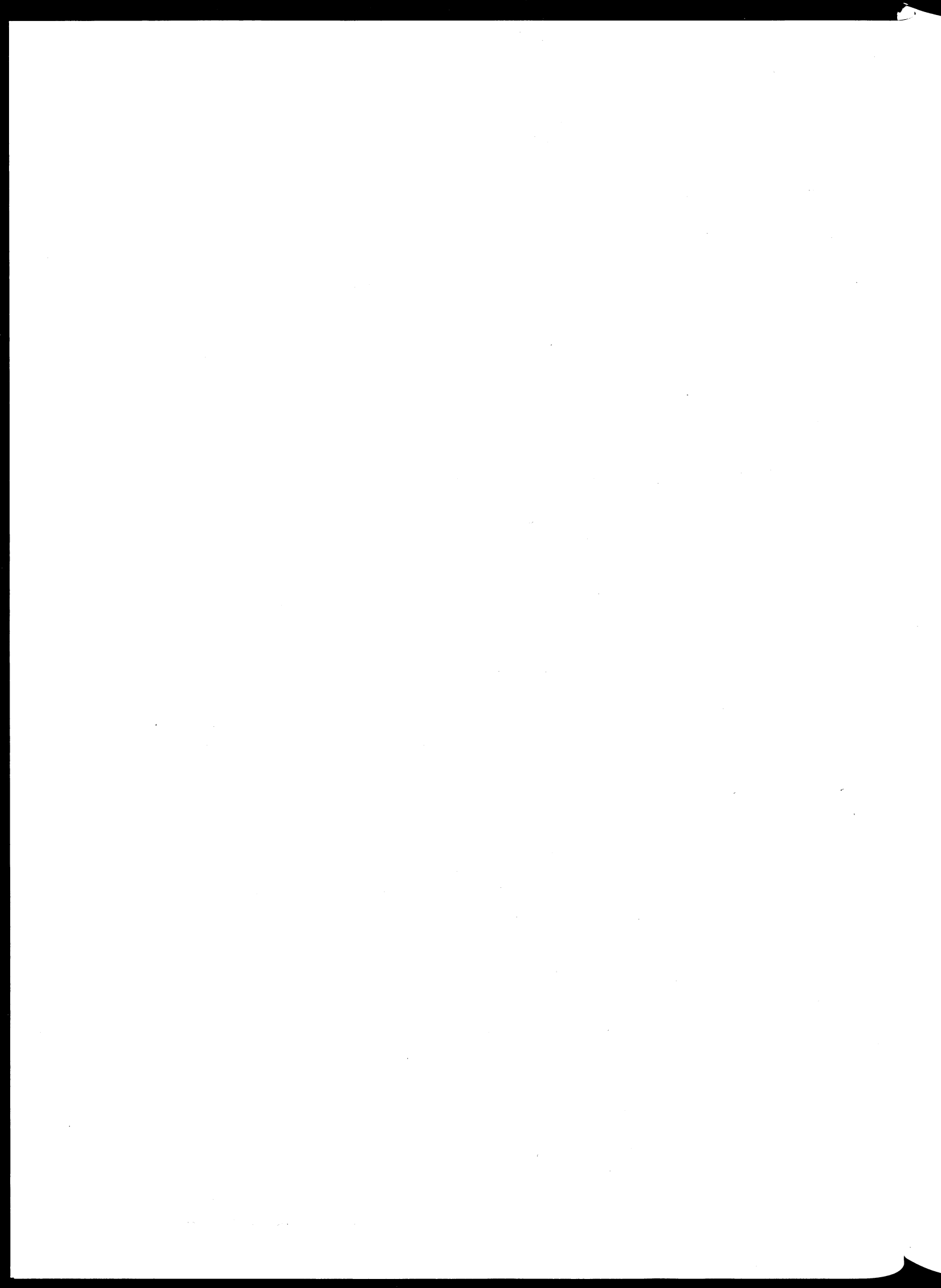
- Improving the economic (or business) climate for all new firms.
- Attempting to provide specific assistance for those new firms with the greatest potential for societal contributions.
- A combination of these two approaches.

Implementation of any universal strategy is likely to be expensive for two reasons. (1) A large number of new firms would be eligible for service: 5,000-10,000 in Minnesota every year. (2) The analysis of factors related to new firm contributions has failed to disclose any with major effects, i.e., none that can be expected substantially to improve jobs, sales, or exports. In sum, improving the overall "business climate" may be difficult and have only modest effects on new firm contributions.

The alternate strategy--providing specific assistance to selected high-potential new firms--can be implemented at any level. Only a few high-potential new firms, or a larger proportion of high-growth firms, might receive assistance. A key feature of such a selective strategy would be the identification of high-potential new firms to receive attention.

Developing procedures for identifying high-potential new firms should be possible. Two results from this project are encouraging. First, high annual sales growth--the key indicator--is obvious early in the life of a new firm; usually within twenty-four months of initial sales. Second, the procedures used in this project located and identified such new firms using readily available public data. If it can be done for research purposes, it can be done for a public program.

Furthermore, programs focusing on new firms with both high growth and a national export orientation should give careful attention to three major industries (manufacturing, distributive services, and business services). High-growth regional exporters are also found in construction (perhaps in border communities) and retail. High-growth, local market new firms are to be found in most industry sectors, the major exception being consumer services.



## Chapter 4

### START-UP PROBLEMS: NATURE AND CURRENT STATUS

The respondents, who were involved in starting the new firms, were asked to identify major start-up problems from a list of forty-one; for each problem they mentioned, an opportunity was provided to indicate whether it was currently solved.

The results are presented in Table 4.1, ranked in descending order. The average ranking for each problem is also provided; the correlation with the percentage indicating the problem was "major" is extremely high.

The percentage currently solved is also presented. The less frequently a problem was said to be "major," the more likely it is considered currently solved.

The problems at the top of the list tend to involve financial management, locating employees, and obtaining external financial support. As these problems were presented in groups and clearly overlap, analysis was completed to see if they could be classified into major categories. Not only could they be placed into nine major groups, but these groups were very similar to those developed in other comparable surveys of new firms and their problems.

#### START-UP PROBLEM DIMENSIONS

The major dimensions, reflecting the major types of problems, that emerged from the factor analysis were as follows:

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General Label	No. Items in Factor	Average % Major Problem	Average Severity	Average % Fully Solved
Financial support	4	36	2.06	39
Marketing strategy	11	23	2.01	25
Manage cash	4	36	1.99	38
Government relations	3	25	1.96	41
Develop/implement plan	6	15	1.92	25
Personnel/cohesion	6	20	1.91	31
Site	2	17	1.86	73
Access	3	9	1.65	47
Infrastructure	2	6	1.50	60
Unions	1	6	1.44	39

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Table 4.1. START-UP PROBLEMS: RANKED BY SEVERITY

	Percentage Major (3)	Rating Problem As Minor (2)	Never (1)	Average Severity	Percent Fully Solved	Percent Partly Solved	Percent Not Solved
Obtaining equity financing	40	38	22	2.11	33	44	19
Securing operational financing	39	41	20	2.11	36	45	8
Obtaining debt financing	39	41	21	2.09	34	41	10
Managing cash flow	34	52	14	2.16	28	60	15
Finding competitive advantages	32	54	14	2.19	24	64	13
Effective selling techniques	31	52	16	2.11	17	68	10
Obtaining liability insurance	28	47	25	2.01	45	32	26
Developing new products/services	27	57	16	2.06	14	67	5
Pricing products/services	27	56	17	2.05	28	64	10
Finding qualified managers/executives	27	41	32	1.99	27	55	9
Developing accounting/control systems	25	60	15	2.04	46	45	13
Finding qualified employees	25	55	21	2.03	30	55	23
Finding qualified technical staff	25	51	24	2.01	26	60	18
Establish a banking relationship	25	49	26	1.92	50	37	19
Analyzing competition	24	63	13	2.10	23	67	18
Collecting accounts receivable	24	57	19	2.06	23	59	9
Coping with government regulations	24	57	19	2.05	37	46	5
Writing ad copy, selecting media	22	56	22	2.02	21	61	19
Obtaining real estate financing	22	33	45	1.81	41	36	8
Delivering on time/within budget	21	57	23	1.92	28	64	14
Understanding industry trends	20	58	23	1.97	24	67	23
Assessing customer needs	19	60	21	1.96	29	66	8
Managing capital	18	60	22	1.94	31	61	13
Locating suitable rental space	18	56	26	1.89	73	22	13
Preparing a business plan	16	63	21	1.94	36	54	23
Implementing plans/objectives	16	67	17	1.93	19	71	17
Identifying/selecting a suitable site	16	53	31	1.82	72	22	4
Using/updating a business plan	15	63	22	1.92	25	62	10
Measuring performance against plans	15	64	22	1.91	21	65	10
Motivating/compensating personnel	15	61	24	1.88	29	63	14
Providing after-sale service	15	59	26	1.87	32	59	10
Minimizing start-up team conflict	15	41	44	1.70	39	53	6
Setting goals for personnel	14	68	18	1.93	23	68	15
Clarifying goals/objectives	13	67	19	1.90	23	66	9
Access to customers	13	51	37	1.74	46	49	5
Coordinating tasks among units	12	64	24	1.87	32	62	8
Providing customer service	12	64	24	1.83	30	67	6
Selecting accountant/lawyer	10	61	30	1.76	69	27	23
Access to suppliers	7	52	41	1.62	52	44	5
Access to employees	7	47	45	1.59	44	51	5
Appropriate transportation structure	6	42	52	1.52	60	35	6
Appropriate infrastructure	6	37	58	1.47	59	41	5
Developing relationships with unions	6	26	68	1.44	39	39	1
Average	20	54	26	1.91	35	53	12



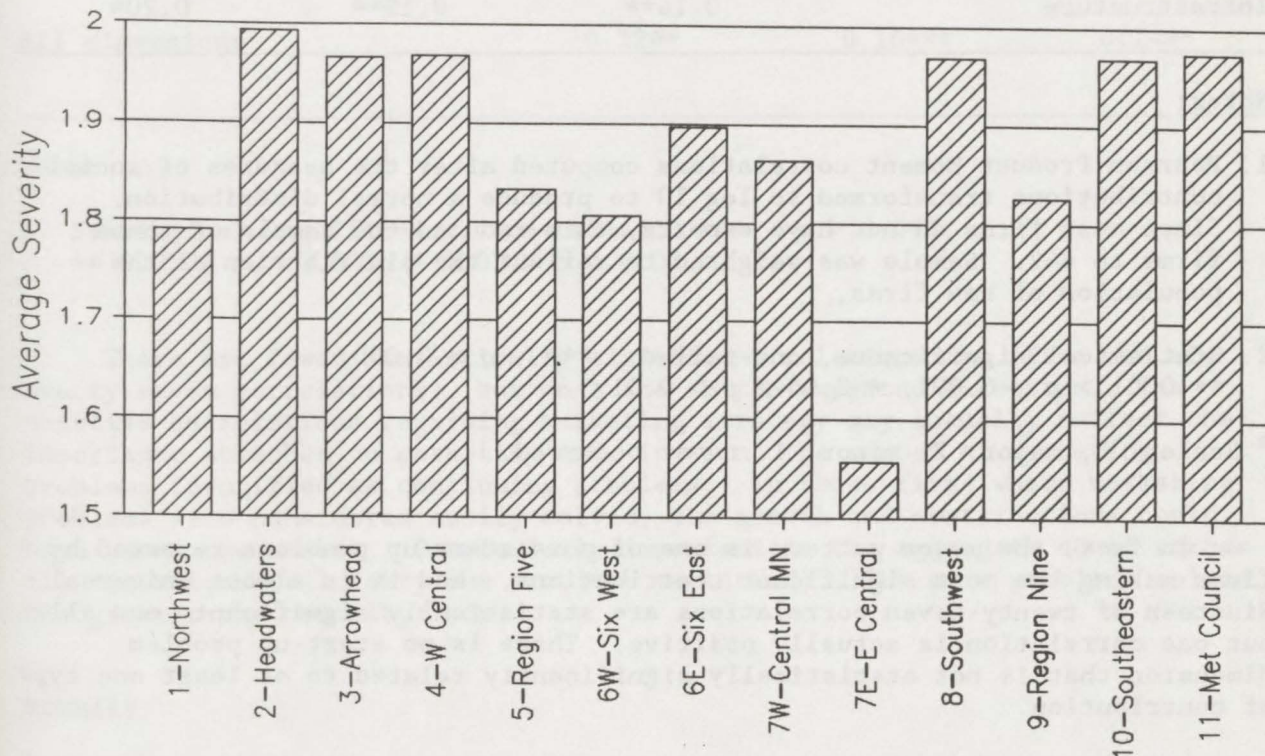
The details of the items, along with each dimension, are presented in Appendix E, as are the characteristics of the distribution and reliability of each dimension.

The range of problem severity and solved (or unsolved) problems is much less among the dimensions than among individual items. In particular, the relationship between "severity" and "solved" is reduced substantially. This suggests considerable variation in the "solution status" of problems in each dimension among the firms in the sample.

#### VARIATION AMONG MINNESOTA REGIONS

The average start-up problem severity is presented for each Minnesota region in Figure 4.1. Considered as a group, the severity of start-up problems is lower for the Greater Minnesota regions than in the Twin Cities metropolitan region. This may reflect, as much as anything else, the lack of high-growth new firms in the Greater Minnesota regions. High-growth new firms tend to report more start-up problems. It could also reflect the strikingly low severity for the East Central region (7E), although this region has a small number of firms.

Figure 4.1. START-UP PROBLEM SEVERITY FOR MINNESOTA REGIONS





## START-UP PROBLEMS AND SOCIETAL CONTRIBUTIONS

A key issue is, of course, the relationship between the severity of start-up problems and the societal contributions (jobs, sales, and exports) made by the firms. The simplest measures of association, product moment correlations, are presented in Table 4.2. As major problems were given a rating of 3, and those that never occurred a rating of 1, a positive correlation would suggest that more severe start-up problems are associated with more contributions.

Table 4.2. START-UP PROBLEMS AND SOCIETAL CONTRIBUTIONS

Start-up Problem Dimension <sup>a</sup>	Problem Severity Correlated with Contributions (1, 2)		
	1986 Jobs	1985 Sales	1985 Exports
Manage cash	0.14***	0.14**	-0.07
Marketing strategy	0.15***	0.07	0.04
Financial support	0.19***	0.17**	0.29***
Government relations	0.23***	0.20***	0.34***
Develop/implement plan	0.14***	0.11*	0.13
Personnel/cohesion	0.21***	0.15**	0.27**
Site	0.07	0.08	0.21**
Access	0.09*	0.03	0.13
Infrastructure	0.16**	0.15**	0.20*

### Notes:

1. Pearson Product Moment correlations computed after the measures of social contributions transformed to log 10 to produce a normal distribution. Since most firms do not have exports, this reduced the sample of these firms to 442. Sample was weighted to reflect the distribution of the population of new firms.
2. Statistical significance, one-tailed: \*\*\* -  $p > 0.000$ ;  
\*\*  $0.01 > p > 0.001$ ; \*  $0.05 > p > 0.01$ .

<sup>a</sup> Scale: 3, major; 2, minor; 1, never occurred.

In fact, the major pattern is one of more start-up problems reported by firms making the most significant contributions. And it is almost universal. Nineteen of twenty-seven correlations are statistically significant, and all but one correlation is actually positive. There is no start-up problem dimension that is not statistically significantly related to at least one type of contribution.

In short, new firms making the greatest contributions--those growing the fastest--report more serious problems at start-up.

## SOLUTION OF START-UP PROBLEMS

Given that high-contributing new firms have more start-up problems, are they solving these problems? A preliminary analysis is provided in Table 4.3. It presents the simple correlations between the absolute number of fully solved start-up problems and the contributions (jobs, sales, exports) at the time of the interview.

Table 4.3. START-UP PROBLEM SOLUTION AND CONTRIBUTIONS

Start-up Problem Dimension	Absolute Number Solved Correlated with Contributions		
	1986 Jobs	1985 Sales	1985 Exports
Manage cash	-0.02	0.02	0.04
Marketing strategy	-0.10*	0.01	-0.10
Financial support	0.06	0.16***	0.08
Government relations	-0.02	-0.02	-0.02
Develop/implement plan	0.04	0.02	0.00
Personnel/cohesion	-0.10	0.01	-0.10
Site	0.08	0.01	0.02
Access	0.11*	0.14**	0.10
Infrastructure	0.06	0.20*	0.06
All dimensions	0.12**	0.16***	0.14**

### Note:

1. Statistical significance, one-tailed: \*\*\* -  $p > 0.000$ ;  
\*\*  $0.01 > p > 0.001$ ; \*  $0.05 > p > 0.01$ .

There are fewer statistically significant relationships (five out of twenty-seven correlations), but most are in the expected direction. The negative correlations regarding marketing strategy may actually reflect the importance attached to marketing and, in turn, the number of marketing problems identified as continuing problems. In those firms where marketing problems were considered easily solved, the growth and contributions could have been more modest. Particularly important is the aggregate count across all dimensions (all forty-one problems mentioned). The more problems solved, the greater the contributions.

### SUMMARY

The inventory of start-up problems seems to capture most of the concerns that could be expressed during the initiation of a new firm. The forty-one items can be successfully summarized by nine general dimensions. There is little major variation in start-up problem severity associated with Minnesota regions.

A pervasive and significant pattern was found between the severity of specific start-up problem dimensions and the level of sales, jobs, and exports provided to the Minnesota economy. Firms making greater contributions report more problems of every type. Further, firms providing greater contributions reported solving a larger number of start-up problems.

## Chapter 5

### MINNESOTA INFRASTRUCTURE

When asked why they started a new firm in Minnesota, the most frequent specific response from those surveyed was:

I live here!!!

The most common theme, mentioned by half of the respondents, relates to their knowledge of, or familiarity with, the area as a context for pursuing business. Spontaneous comments on their reasons for locating in Minnesota and at a specific site are presented in Table 5.1. These responses are not affected by the region of Minnesota or industry sector of the new firm. People tend to start new firms where they have established personal, family, and business relationships.

Firms chosen for the survey were selected on the basis of a Minnesota start-up, not the residence of those starting the firm. Yet there is virtually no evidence that anyone moved to Minnesota to start a new firm.

Different themes are reflected in comments about the choice of a specific site for the new business. The comments summarized in Table 5.1 indicate that the relative attractiveness of the location is critical.<sup>1</sup> "Live here!" includes the one in twelve (8 percent) that started a business in the home; the other one in twelve (another 8 percent) presumably is referring to the neighborhood or community.

The universal choice of "home" as a place to start a new business does not mean that "home" is perfect. The following will review selected features of the immediate context in which new firms start their business, referred to as local infrastructure. Both the importance and satisfaction with twenty different aspects of infrastructure are examined.

A number of services might be provided to new firms by local, regional, and state governments. Reactions to these services conclude this chapter.

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<sup>1</sup> Most sites are assumed to be within commuting distance of the homes of the start-up team members.

Table 5.1. REASONS FOR NEW FIRM LOCATION (in percents)

Reason Given	For Starting in Minnesota	For Choosing Specific Site
Location specific	41	62
Central location		
Access to customers, suppliers, trans- portation, home, business contacts, metropolitan area, important markets		
Live here	41	16
Work at home		
Lack of (inadequate) competition	15	3
Familiar with area	11	5
Know markets, business contacts		
Site attractiveness	8	39
Land, building suitable		
Cost appropriate		
Enough space		
Owned property (land/structure)	2	5

Note: Multiple responses allow for column totals greater than 100 percent.

#### LOCAL INFRASTRUCTURE FEATURES: IMPORTANCE AND SATISFACTION

Respondents were asked about the relative importance of twenty different aspects of the infrastructure in which the new firm operates. The importance assigned to these is presented in Table 5.2.

Access to customers is clearly the most important infrastructure feature; four of five (83 percent) considered it "very" important. Only one of twenty (5 percent) considered it not important. Access to customers is in a class by itself.

Also in a class by itself is access to research and development facilities. Only one in five (18 percent) considered it very important, and over half (57 percent) considered it not important. One other feature is considered almost as unimportant: land availability (for expansion, etc.).

The remaining features fall between these extremes. Five could be considered of high importance: taxes; quality of life; access to suppliers; capital availability; and labor costs. Six are of moderate importance: local government support for business; availability of highly skilled workers; energy reliability; energy costs, transportation; and building space expenditures. Six are of low importance: land purchase, rental costs; local regulations; educational and training opportunities; building space availability; physical infrastructure; and zoning and land use.

Table 5.2. IMPORTANCE OF LOCAL INFRASTRUCTURE FEATURES

	Importance (in percents)			Average Importance
	Very (2)*	Some- what (1)*	Not (0)*	
Access to customers	83	12	5	1.78
Taxes	67	24	9	1.59
Quality of life	64	27	10	1.54
Access to suppliers	62	24	14	1.49
Capital availability	59	28	14	1.45
Labor costs	59	26	16	1.43
Local government support for business	54	28	18	1.36
Availability of highly skilled workers	54	23	23	1.31
Energy reliability	47	33	20	1.28
Energy costs	41	40	18	1.23
Transportation (highways, railroads)	42	37	21	1.21
Building space expenditures (rent, etc.)	43	32	25	1.18
Land purchase, rental costs	42	30	27	1.16
Local regulations	38	39	22	1.16
Educational and training opportunities	36	34	30	1.07
Building space availability	35	37	28	1.07
Physical infrastructure (roads, water)	34	38	28	1.06
Zoning and land use	33	35	32	1.01
Land availability (for expansion, etc.)	26	32	42	0.83
Access to research and development facilities	18	25	57	0.60
Average	46	30	24	1.21

\*Importance graded on a scale of 0 to 2 as indicated in parentheses.

Note: Row totals may not equal 100 percent due to rounding off.

Satisfaction with these same twenty infrastructure features is presented in Table 5.3. Two aspects rate very high on satisfaction: access to customers and quality of life. Over half the respondents indicated they were very satisfied with these features. Seven features had above average satisfaction ratings: energy reliability; access to suppliers; transportation; physical infrastructure; building space availability; labor costs; educational and training opportunities. Eight had below average satisfaction ratings: availability of skilled workers; land purchase, rental costs; land availability, building space expenditures; zoning and land use; capital availability; local regulations; energy costs; and access to research and development facilities.



Table 5.3. SATISFACTION WITH LOCAL INFRASTRUCTURE FEATURES

	Satisfaction (in percents)			Average Satis- faction.
	Very (2)*	Some- what (1)*	Not (0)*	
Quality of life	52	36	8	2.49
Access to customers	53	39	7	2.46
Energy reliability	47	46	7	2.39
Access to suppliers	47	42	11	2.35
Transportation (highways, railroads)	43	49	8	2.35
Physical infrastructure (roads, water)	41	48	11	2.30
Labor costs	33	59	9	2.24
Building space availability	36	50	15	2.21
Education and training opportunities	32	50	19	2.13
Availability of highly skilled workers	32	48	20	2.11
Land purchase, rental costs	25	59	16	2.10
Land availability (for expansion, etc.)	31	48	21	2.09
Building space expenditures (rent, etc.)	25	58	18	2.07
Zoning and land use	23	57	20	2.04
Capital availability	27	46	27	2.00
Local regulations	24	53	22	1.98
Energy costs	17	62	21	1.96
Access to research and development facilities	20	48	32	1.87
Local government support for business	17	44	39	1.78
Taxes	5	33	62	1.44
Average	33	48	19	2.12

\*Satisfaction graded on a scale of 0 to 2 as indicated in parentheses.

Note: Row totals may not equal 100 percent due to rounding off.

Two features are quite distinctive for their very low rating: taxes and local government support for business. Reported dissatisfaction with taxes is widespread, with almost two of three indicating "not satisfied."

The relationship between the relative importance and relative satisfaction with these twenty aspects of the local infrastructure is presented in Table 5.4. The overall association is positive; those factors considered more important tend to be those with the highest reported satisfaction. For example, access to customers, distinctive in importance, also leads the list in terms of satisfaction.

But there are two major exceptions. There is strong agreement that both taxes and local government support for business are relatively important, yet satisfaction with both is very low. Low satisfaction with taxes is most notable in this regard.

The reason for this low satisfaction is open to speculation. It may reflect a resentment of taxes or the failure of local government to provide timely, appropriate support for new business firms. It may be that those starting new businesses do not understand the basis for the various taxes or how they might obtain help from the local government.

Table 5.4. SATISFACTION WITH AND IMPORTANCE OF INFRASTRUCTURE FEATURES

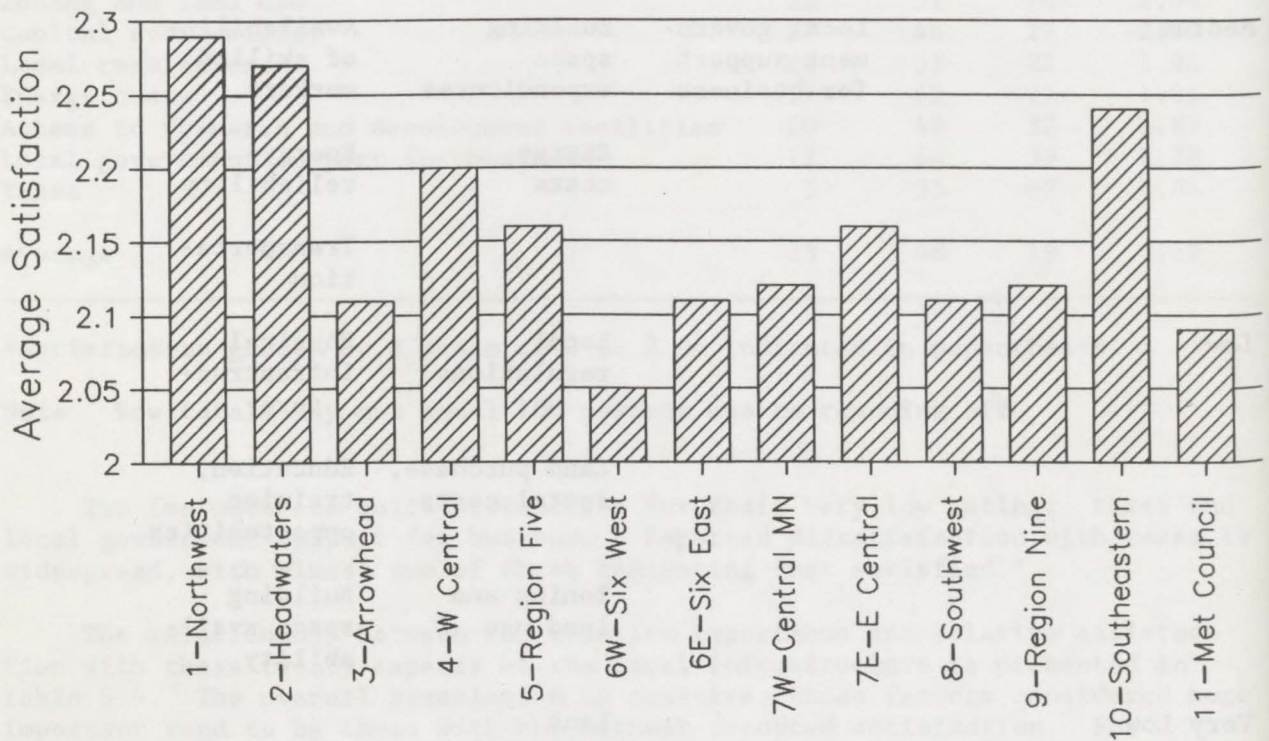
Importance	Satisfaction			
	Very Low	Below Average	Above Average	Very High
Very high				Access to customers
High	Taxes	Capital availability	Labor costs	Quality of life
			Access to suppliers	
Medium	Local government support for business	Building space expenditures	Availability of skilled workers	
		Energy costs	Energy reliability	
			Transportation	
Low		Local regulations	Physical infrastructure	
		Land purchase, rental costs	Education, training opportunities	
		Zoning and land use	Building space availability	
Very Low		Land availability		
		Access to research and development facilities		

## MINNESOTA REGION AND INFRASTRUCTURE SATISFACTION

It is always possible that satisfaction with infrastructure features may vary by region. For example, there may be differences in labor costs or road conditions. The average satisfaction with the local infrastructure is presented in Figure 5.1. The most significant pattern is the clear difference between the Twin Cities metropolitan region and all the regions of Greater Minnesota; overall satisfaction with the infrastructure is slightly higher in the Greater Minnesota regions. Because of the small number of firms in the Greater Minnesota regions and the small variation in satisfaction (range of 2.05 to 2.30), differences among the nonmetropolitan regions are not significant.

The most appropriate conclusion may be that there is little effect of the specific region on satisfaction with infrastructure features. The level of satisfaction (or dissatisfaction) is quite uniform across all regions of Minnesota.

Figure 5.1 MINNESOTA REGION AND INFRASTRUCTURE SATISFACTION



## TYPE OF NEW FIRM AND REACTIONS TO INFRASTRUCTURE

It was clear from the analysis in Chapter 3 that some new firms make substantially greater contributions (jobs, sales, exports) than others. New firms with high growth rates and an export orientation were distinctive in their contributions. For this analysis the sample has been divided into four groups: (1) export orientation and high growth; (2) export orientation and low growth; (3) local market and high growth; (4) and local market and low growth. The importance attached to these twenty infrastructure features by those starting these different types of firms is presented in Table 5.5; statistical significance is indicated in the last column.

Table 5.5. EXPORT, GROWTH STATUS, AND INFRASTRUCTURE IMPORTANCE, BY NEW FIRM TYPE

	Export		Local Market	
	High Growth	Low Growth	High Growth	Low Growth
Access to customers	1.62	1.49	1.73	1.87***
Taxes	1.59	1.51	1.73	1.59
Quality of life	1.51	1.56	1.61	1.56
Capital availability	1.60	1.32	1.48	1.48
Access to suppliers	1.40	1.38	1.45	1.56
Labor costs	1.57	1.14	1.69	1.36***
Availability of highly skilled workers	1.38	1.03	1.60	1.26**
Local government support for business	1.19	1.00	1.38	1.46**
Energy reliability	1.28	1.04	1.24	1.34
Building space expenditures (rent, etc.)	1.49	1.10	1.10	1.21*
Transportation (highways, railroads)	1.31	1.22	1.17	1.22
Energy costs	1.18	1.07	1.29	1.28
Land purchase, rental costs	1.32	0.93	1.29	1.13*
Educational and training opportunities	1.18	0.88	1.09	1.04
Local regulations	1.06	0.94	1.33	1.20*
Building space availability	1.28	0.79	1.22	1.12**
Physical infrastructure (roads, water)	1.07	1.01	1.02	1.12**
Zoning and land use	1.00	0.85	0.96	1.03
Land availability (for expansion, etc.)	1.10	0.61	0.90	0.89*
Access to research & development facilities	0.72	0.77	0.62	0.59
Average	1.29	1.09	1.30	1.27*

Note: Statistical significance: \*\*\* -  $p < 0.0000$ ;  
 \*\* -  $0.0000 < p < 0.001$ ; \* -  $0.05 > p > 0.001$ .

Statistically significant differences in the importance of the infrastructure features are presented for eight of the twenty items.<sup>2</sup> They are summarized in the accompanying tabulation.

	Consider More Important	Consider Less Important
High-growth new firms (export & local market)	Labor costs Land purchase, rental costs Building space expenditures	
Local market new firms (high and low growth)	Access to customers Local government support Local government regulations	
Exporting, low-growth new firms		Building space availability Skilled worker availability Land availability

High-growth new firms (exporting and local market) tend to place greater emphasis on labor costs, land purchase and rental costs, and building space expenditures. Those emphasizing a local market (high and low growth) have a major concern with access to customers, local government support, and local government regulations. Perhaps most distinctive are the low-growth, export-oriented new firms: they consider a number of factors less important than other types of new firms, including the availability of building space, skilled workers, and land for expansion.

Average satisfaction with these local infrastructure features for the four types of new firms is presented in Table 5.6. There are statistically significant differences for only two of the twenty features. Both provide a distinctive picture, indicating that low-growth, exporting and high-growth, local market new firms are more satisfied with access to research and development facilities and less satisfied with taxes.

<sup>2</sup> The test of significance, a one-way analysis of variance, indicates only that the differences would probably not have occurred by chance. Interpretation is required to determine the basis for the statistically significant differences.

Table 5.6. EXPORT, GROWTH STATUS, AND INFRASTRUCTURE SATISFACTION,  
BY NEW FIRM TYPE

	Export		Local Market	
	High Growth	Low Growth	High Growth	Low Growth
Quality of life	2.49	2.64	2.55	2.51
Access to customers	2.44	2.27	2.53	2.49
Energy reliability	2.32	2.36	2.29	2.37
Access to suppliers	2.22	2.26	2.38	2.35
Transportation (highways, railroads)	2.41	2.47	2.31	2.34
Physical infrastructure (roads, water)	2.33	2.25	2.32	2.32
Building space availability	2.22	2.20	2.26	2.22
Labor costs	2.21	2.14	2.16	2.24
Education and training opportunities	2.19	2.12	2.10	2.11
Availability of highly skilled workers	2.18	2.17	2.04	2.17
Land availability (for expansion, etc.)	2.11	2.29	2.22	2.07
Building space expenditures (rent, etc.)	2.06	2.03	2.07	2.07
Land purchase, rental cost	2.08	1.88	2.12	2.07
Zoning and land use	2.03	1.85	1.94	2.02
Capital availability	2.04	2.05	1.89	2.02
Local regulations	1.92	1.92	1.97	1.97
Energy costs	1.92	2.07	1.93	1.95
Access to research-development facilities	1.81	2.03	2.07	1.84*
Local government support for business	1.66	1.67	1.71	1.81
Taxes	1.38	1.27	1.28	1.46*
Average	2.11	2.09	2.11	2.12

Note: Statistical significance: \*\*\* -  $p < 0.0000$ ;  
\*\* -  $0.0000 < p < 0.001$ ; \* -  $0.05 > p > 0.001$ .

#### REACTION TO POTENTIAL GOVERNMENT SERVICES

A range of services and assistance may be provided to new firms by state, regional, and local governments. The reaction to thirty-one such services in terms of interest and value was obtained from most respondents. The average response and proportion showing a high level of interest or perceived value are presented in Table 5.7. They are rank ordered by the average response.

The range of responses is considerable, almost one in three showing a high interest in marketing skills development and working capital financing. About one in sixteen (6 percent) show a high interest in small-business incubator sites, energy development opportunities, infrastructure financing, and energy audits, conservation projects.



Table 5.7. INTEREST IN AND VALUE OF POTENTIAL GOVERNMENT SERVICES

	Percent with High Interest	Average Interest
Marketing skills development	26	1.59
General business management development	21	1.51
Working capital financing	29	1.50
Finance skill development	24	1.49
Personnel management skill development	22	1.48
Training new employees	18	1.24
Knowledge of government regulations	14	1.22
AVTI small-business programs <sup>a</sup>	16	1.19
Machinery, equipment financing	17	1.13
Small-business development centers	14	1.08
Community college small-business programs	12	1.08
Entrepreneurial training	13	1.06
Building construction financing	19	1.06
Skills in labor-management relations	10	0.95
Retraining existing employees	11	0.94
New technology for productivity gains	13	0.93
Venture, seed capital financing	16	0.92
Land acquisition financing	13	0.81
Employee ownership financing	9	0.78
New site locations within a county	8	0.71
Engineering, scientific skill development	6	0.70
New site locations within Minnesota	7	0.62
Energy audits, conservation projects	7	0.59
Applying company's research and development in new markets	8	0.57
Federal procurement assistance	9	0.57
Infrastructure financing	6	0.55
Tourism market development	10	0.54
Energy development opportunities	6	0.53
Joint research and development product development	6	0.53
Small-business incubator sites	6	0.51
Develop foreign export markets	6	0.39
Average	14	0.93

Note: Interest scale: High, 3; Moderate, 2; Low, 1; None, 0.

<sup>a</sup> AVTI refers to area vocational technical institutes, a post-high school training system in operation in Minnesota.

The large number of new firms initiated each year in Minnesota suggests that the absolute numbers of potential clients for these services may be substantial. Assuming that 10,000 new business entities are initiated annually in Minnesota, as many as 600 may be interested in even the least popular service. The more popular would attract the interest of 3,000 each year. Over a single decade, this would be a potential client base of 6,000-30,000. The more popular programs are likely to be related to financial assistance or programs to provide training and development of management, administrative, or supervisory skills.

The relative interest in these thirty-one services by the four types of new firms is presented in Table 5.8. There are statistically significant differences among types of new firms for twenty-one of the thirty-one services.

Thirteen, associated with increased interest among high-growth new firms, are summarized in the accompanying tabulation:

All High Growth (export and local market)	Exporting (high and low growth)	Local Market High Growth
Personnel management skill development	Applying company's research and de- velopment in new markets	New site locations within the county
Knowledge of government regulations	Joint research and development product development	New site locations within Minnesota
Building construction financing	Develop foreign export markets	Federal procurement assistance
Skills in labor- management relations		
Retraining existing employees		
Land acquisition financing		
Training new employees		
Engineering, scientific skill development		

This reflects a pattern of interest consistent with the distinctive problems associated with different forms of growth. For example, local markets high-growth new firms are the only ones with a special interest in site location assistance; exporting firms are interested in assistance with developing foreign export markets.

Table 5.8. EXPORT, GROWTH STATUS, AND INTEREST IN AND VALUE OF POTENTIAL GOVERNMENT SERVICES, BY NEW FIRM TYPE

	Export		Local Market	
	High Growth	Low Growth	High Growth	Low Growth
Marketing skills development	1.90	1.76	2.08	1.39***
General business management development	1.71	1.71	1.92	1.41**
Working capital financing	2.00	1.86	1.92	1.31***
Finance skill development	1.66	1.58	1.71	1.39
Personnel management skill development	1.78	1.59	1.87	1.43*
Training new employees	1.70	1.07	1.65	1.07***
Knowledge of government regulations	1.46	1.21	1.63	1.04*
AVTI <sup>a</sup> small-business programs	1.05	1.15	1.25	1.20
Machinery, equipment financing	1.34	1.48	1.27	1.07
Small-business development centers	0.84	1.03	1.12	1.12
Community college small-business programs	1.05	1.10	1.23	1.04
Entrepreneurial training	1.24	1.16	1.39	1.03
Building construction financing	1.33	0.83	1.39	0.95*
Skills in labor-management relations	1.25	0.90	1.32	0.88*
Retraining existing employees	1.31	0.89	1.55	0.78***
New technology for productivity gains	1.40	1.45	1.30	0.77***
Venture, seed capital financing	0.87	1.16	1.18	0.79*
Land acquisition financing	1.00	0.80	1.11	0.70*
Employee ownership financing	1.14	0.50	0.74	0.78*
New site locations within a county	0.43	0.40	1.19	0.59***
Engineering, scientific skill development	0.90	0.78	0.95	0.60*
New site locations within Minnesota	0.69	0.69	1.02	0.51**
Energy audits, conservation projects	0.82	0.65	0.64	0.60
Applying company's research and development in new markets	0.97	1.17	0.63	0.47***
Federal procurement assistance	0.78	0.69	0.96	0.40***
Infrastructure financing	0.83	0.57	0.71	0.50
Tourism market development	0.24	0.43	0.40	0.62*
Energy development opportunities	0.67	0.40	0.76	0.51
Joint research and development product development	0.77	0.84	0.56	0.46*
Small-business incubator sites	0.46	0.37	0.73	0.48
Develop foreign export markets	0.77	0.67	0.29	0.31**
Average	0.85	1.00	1.11	1.11**

Notes: Interest scale: High, 3; Moderate, 2; Low, 1; None, 0.

Statistical significance: \*\*\* -  $p < 0.0000$ ;

\*\* -  $0.0000 < p < 0.001$ ; \* -  $0.05 > p > 0.001$ .

<sup>a</sup> AVTI refers to area vocation technical institutes, post-high school training system in operation in Minnesota.

Two other statistically significant differences reflect high interest: a greater interest in employee ownership financing by high growth exporting new firms and a greater interest in tourism market development by low-growth local market new firms. While local market new firms show a generally greater interest in government services than export-oriented new firms, they are significantly lower on five: marketing skills development, general business management development, working capital financing, training new employees, and engineering and scientific skill development.

The interest in specific programs does not reflect the interest of individual firms. Variations among different types of new firms are presented in Table 5.9.

Table 5.9. NEW FIRM INTEREST IN GOVERNMENT SERVICES

	Average Number	Percent Interested In				
		None	1-4	5-9	10-14	15-23
All new firms	3.85	30	36	22	9	3
High start-high growth	5.52	17	37	23	12	10
Low start-high growth	4.87	16	42	28	11	3
High start-low growth	2.34	38	39	20	3	1
Low start-low growth	3.50	35	34	20	9	2
National exporter	3.41	30	39	21	8	2
Regional exporter	5.54	7	39	30	22	2
Local market	3.84	30	39	21	8	2
Exporter-high growth	4.48	19	39	26	15	--
Local market-high growth	5.67	14	40	28	9	9
Exporter-low growth	3.81	25	39	22	13	1
Local market-low growth	3.42	36	33	21	8	3
Greater Minnesota	4.45 <sup>a</sup>	25	36	25	10	4
Twin Cities metro region	3.63	30	40	20	8	2

Note: All four comparisons have a statistically significant variation,  $p$  equal to or smaller than 0.05.

<sup>a</sup> Average of the average for the twelve Greater Minnesota regions.

The typical respondent indicated a high level of interest in almost four of these services. Seven in ten indicated a high level of interest in one or more programs and services; one in eight indicated a high level of interest in ten or more.

Interest in help from government services and programs is high for all major types of new firms. There are some variations related to the growth rate of the new firms, an emphasis on regional exports, and a location outside

the Twin Cities metropolitan region. High-growth new firms indicate more interest in government services, as do firms emphasizing regional markets and new firms located outside the Twin Cities metropolitan area.

#### SUMMARY

Major findings related to the contexts in which new firms operate include the following:

- New firms are started by people that live in the area. There is absolutely no indication that people have moved to Minnesota to start new firms.
- There is a clear difference in importance assigned to different infrastructure features: access to customers dominates in importance; access to research and development facilities is considered unimportant by more than half.
- In general, there is a high level of satisfaction with infrastructure features. Satisfaction is generally the highest with regard to those features considered the most important. Satisfaction with infrastructure is relatively uniform across the thirteen regions of Minnesota.
- Taxes are a distinctive infrastructure feature. Considered of high importance, this factor is associated with the lowest level of satisfaction.
- Interest in potential government assistance varies substantially. Three in ten show high interest in management skill development; one in sixteen indicates an interest in small business incubator sites.
- Interest in government services tends to reflect the market orientation of the new firm. Local market oriented new firms show the greatest general interest in all services; exporting new firms show more interest in services related to exports and research and development; high-growth new firms reflect an interest in services related to growth.
- A typical new firm has a high interest in about four government services; seven in ten are interested in one or more.

There are several implications for economic development policies. Two major policy strategies are general attempts to improve the general business climate or programs designed to assist specific new firms.

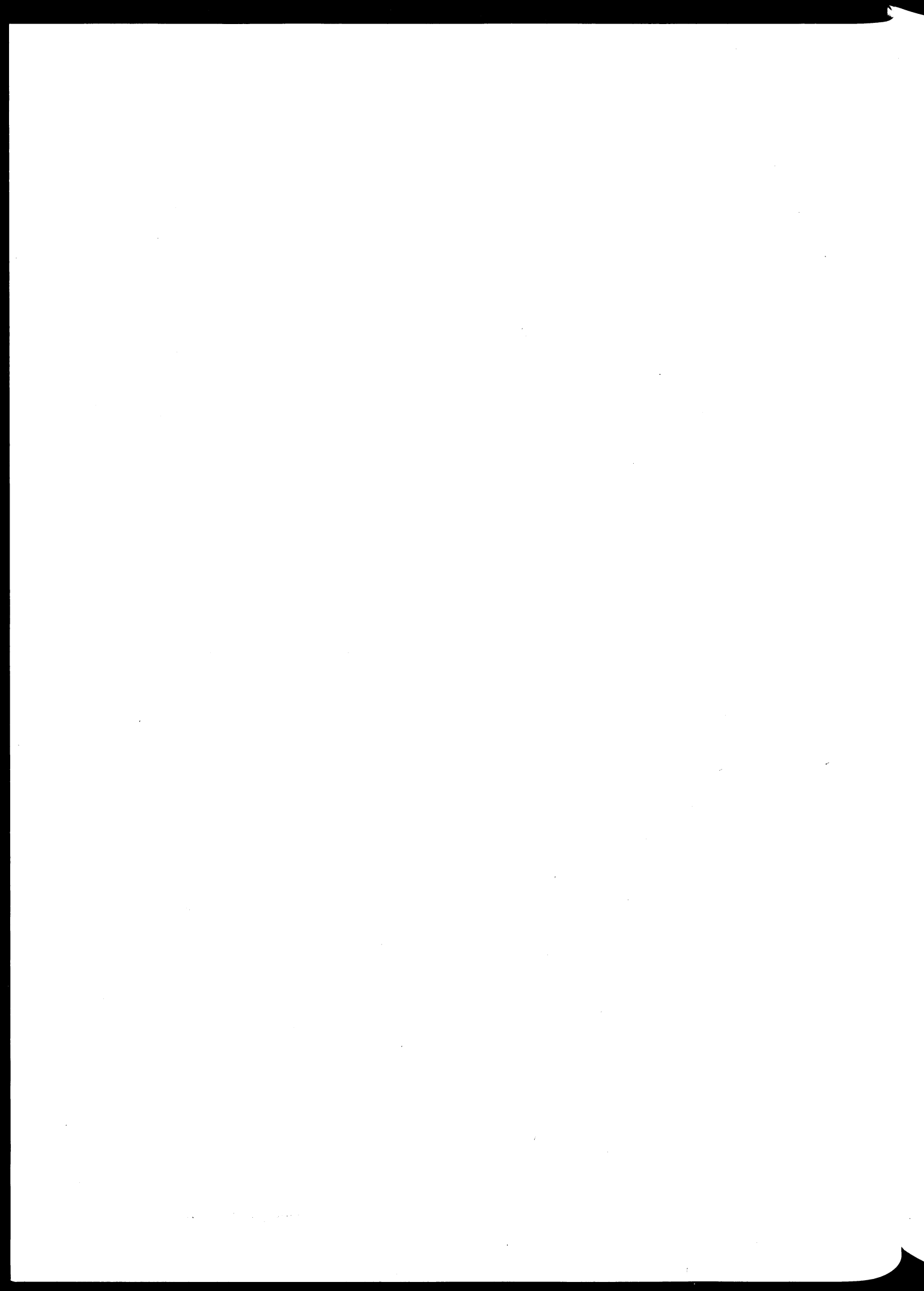
Strategies for enhancing economic development through improving the "business climate" must deal with several major issues: What should be "improved"? Can it be "improved" enough to make a difference?

Perhaps the most important finding from this research was that those starting new firms report relatively high levels of satisfaction with most

features of the infrastructure. And satisfaction is highest with those considered most important. It is not clear what might be "improved" except taxes, and it is not clear that taxes can be "improved" enough to make a major difference.

Conversely, substantial evidence suggests that programs designed to assist specific new firms may "make a difference." Most important, the analysis in Chapter 3 indicated that a small proportion of new firms (one-fourth) are responsible for the majority of the jobs, sales, and exports. The analysis in this chapter suggests that a substantial proportion of new firms were interested in government assistance. Most important, different types of firms showed an interest in different combinations of assistance.

This suggests that a policy of identifying high-potential new firms and providing services tailored to their specific needs could have a substantial payoff. The resulting contributions to jobs, sales, and exports could be more easily measured. This would allow for the modification and correction of such programs to optimize the cost/benefit ratio.





## Chapter 6

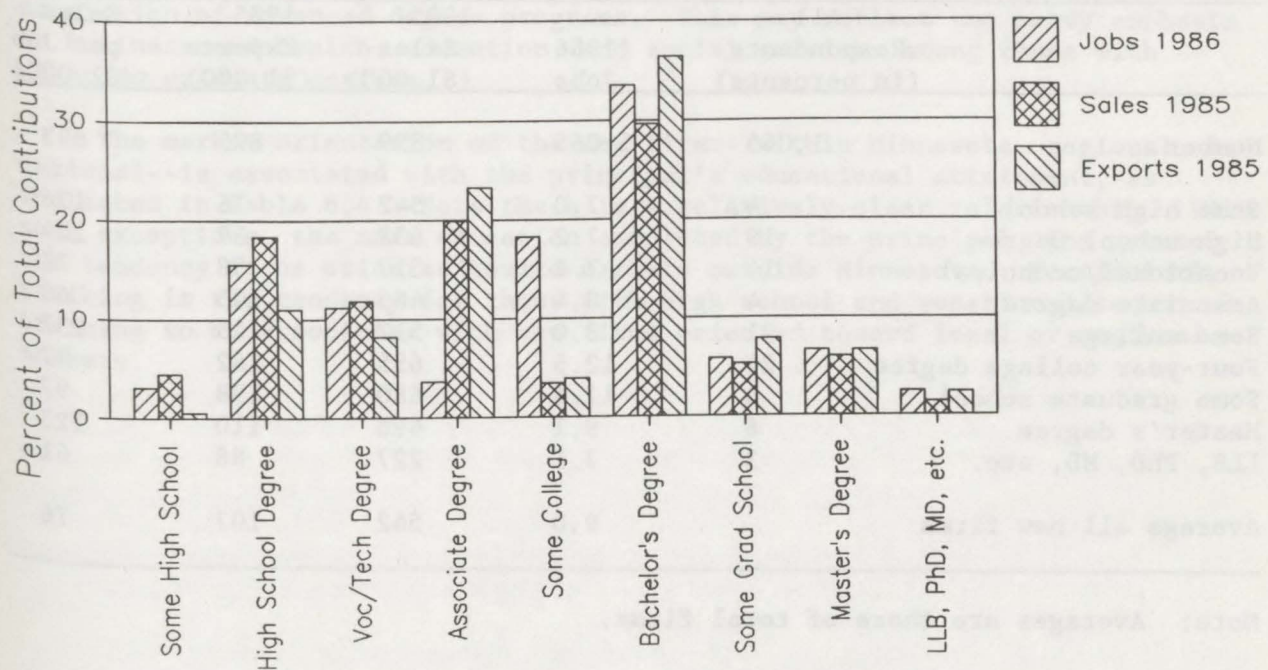
### EDUCATIONAL INSTITUTIONS AND NEW FIRMS

Educational programs and institutions in Minnesota occupy a central role in the development of new firms in two ways. They provide the education and training not only of those who initiate new firms but also of those who work in new firms, the individuals who are both the providers of jobs and a critical resource needed to develop goods and services. Both relationships will be reviewed in this chapter.

#### EDUCATIONAL ATTAINMENT OF NEW FIRM PRINCIPALS

New firms are one major source of jobs, sales, and exports for Minnesota. The individuals who start new firms have completed different amounts and types of formal education.<sup>1</sup> The relationship between the new firms, characterized by the educational attainment of the principal, and the proportion of total contributions recorded in the sample, is presented in Figure 6.1. As the sample is representative of all new firms, the patterns shown there should reflect those of all Minnesota new firms initiated between 1979 and 1984.

Figure 6.1. PRINCIPAL'S EDUCATION AND PERCENT OF TOTAL CONTRIBUTIONS



<sup>1</sup> For this analysis, the education completed by the respondent will be considered as an indicator of that of the entire start-up team, and most new firms (60 percent) are started by two or more individuals. Data on educational attainment are available for almost the entire sample.

The major results can be considered in terms of four educational attainment categories.

	Total Contributions (in percents)		
	Jobs	Sales	Exports
Up to high school degree	19	23	12
Post-high school experience	33	35	35
College (4-year) degree	34	30	36
Post-college (4-year] experience	15	12	17

About one-third of all contributions come from new firms initiated by those with four-year college degrees; about one-third from those with education beyond high school (vocational/technical training, associate degree, some college experience); roughly one-sixth are provided by those with high school experience (both with and without a degree); and approximately one-sixth by those with graduate experience (both with and without a graduate degree).

Those with all levels of educational attainment are making contributions to the state by starting new firms. Overall contributions are related to both the number of new firms and their average size, presented in Table 6.1.

Table 6.1. PRINCIPAL'S EDUCATION AND AVERAGE NEW FIRM CONTRIBUTIONS

	All Respondents (in percents)	1986 Jobs	1985 Sales (\$1,000)	1985 Exports (\$1,000)	Sales per Job (\$1,000)
Number	1,065	1,065	899	895	893
Some high school	4	7.0	542	16	136
High school degree	19	7.2	638	59	134
Vocational/technical	14	7.4	517	58	77
Associate degree	4	8.4	485	105	68
Some college	21	8.0	517	125	257
Four-year college degree	24	12.5	655	162	77
Some graduate school	4	11.6	680	198	97
Master's degree	6	9.1	496	110	123
LLB, PhD, MD, etc.	3	7.1	227	88	61
Average all new firms		9.0	542	107	76

Note: Averages are those of total firms.

Except for slightly more employees for firms started by those with college degrees or some graduate education, there is little variation in the average number of jobs. Average 1985 sales do not vary much, except for new firms started by those who have completed advanced graduate programs; they also have the lowest sales per employee. Exports vary considerably, reflecting the different types of new firms started by those with differing educational attainment.

The industry sector of the new firms is presented by principal's educational attainment in Table 6.2. It is clear that educational attainment does affect the industry in which the new firm is initiated. Those with high school and area vocational technical institute (AVTI) experience tend to start new firms oriented toward local markets--in construction, retail, and consumer services. Those with associate degrees emphasize manufacturing, distributive services, business services and retail. Those with some college, but not a four-year degree, emphasize these four industries and construction. Completion of college and graduate experience leads to a major concentration similar to those with associate degrees: manufacturing, distributive services, business services, and retail. Most distinctive are those who have completed graduate programs, with a substantial emphasis in business services and health, educational, and social services.

The sales development patterns of new firms associated with the principal's educational attainment are presented in Table 6.3. High-growth new firms are associated with all levels of educational attainment, and, ironically, the lowest proportion of high-growth new firms is associated with completion of advanced degree programs. This may reflect the heavy emphasis on business and health, education, and social services among those with advanced graduate degrees.

The market orientation of the new firms--within Minnesota, regional, or national--is associated with the principal's educational attainment, as indicated in Table 6.4. Here there is a relatively clear relationship. With some exceptions, the more education completed by the principal, the greater the tendency to be oriented toward markets outside Minnesota. Particularly striking is the tendency for those with high school and vocational/technical training to be associated with new firms oriented toward local or regional markets.

Table 6.2. PRINCIPAL'S EDUCATIONAL ATTAINMENT AND NEW FIRM INDUSTRY  
(in percents)

	Agricultural									
	:		Mining		:		Construction		:	
	:		:		:		Manufacturing		:	
	:		:		:		Distributive Services		:	
	:		:		:		Business Services		:	
	:		:		:		Retail		:	
	:		:		:		Consumer Services		:	
	:		:		:		Health,		:	
	:		:		:		Education,		:	
	:		:		:		Social		:	
	:		:		:		Services		:	
	:		:		:		:		:	
Some high school	--	--	22	8	15	9	28	20	--	102
High school degree	2	--	16	10	20	7	23	20	1	99
Vocational/technical	1	--	12	13	14	8	31	21	1	101
Associate degree	2	--	2	15	19	18	36	8	2	102
Some college	*	*	17	16	19	14	24	8	2	100
Four-year college degree	2	--	4	13	16	20	39	4	2	100
Some graduate school	2	--	--	19	22	27	19	6	5	100
Master's degree	3	1	1	13	11	36	26	--	9	100
LLB, PhD, MD, etc.	2	--	--	4	7	47	17	--	22	99
All new respondents	2	*	10	13	17	16	29	11	3	101
Some high school	--	--	8	2	3	2	4	7	--	
High school degree	29	--	30	15	23	9	16	36	5	
Vocational/technical	10	--	16	14	11	6	15	26	4	
Associate degree	4	--	1	4	4	4	5	3	3	
Some college	6	50	36	26	23	17	17	15	14	
Four-year college degree	30	--	8	24	23	30	33	10	17	
Some graduate school	4	--	--	7	6	8	3	2	9	
Master's degree	13	50	1	6	4	14	6	--	24	
LLB, PhD, MD, etc.	4	--	--	1	1	9	2	--	26	
Column totals	100	100	100	99	98	99	101	99	102	

Note: Asterisks indicate less than 0.6 percent. Both the weighted sample and rounding off of figures lead to a total not equal to 100 percent.

Table 6.3. PRINCIPAL'S EDUCATION AND NEW FIRM DEVELOPMENT (in percents)

	Low Start Low Growth	High Start Low Growth	Low Start High Growth	High Start High Growth	Total High Growth
Some high school	79	2	5	13	19
High school degree	74	9	10	8	17
Vocational/technical	74	4	16	6	22
Associate degree	77	--	19	4	23
Some college	69	4	16	10	27
Four-year college degree	55	13	21	10	22
Some graduate school	55	14	15	16	21
Master's degree	58	2	30	10	40
LLB, PhD, MD, etc.	80	4	12	5	16

Table 6.4. PRINCIPAL'S EDUCATION AND MARKET ORIENTATION (in percents)

	Within State	Regional	National	Total Exports
Some high school	94	4	2	6
High school degree	92	4	4	8
Vocational/technical	89	8	3	11
Associate degree	80	9	11	20
Some college	82	7	10	17
Four-year college degree	78	8	14	22
Some graduate school	73	10	16	26
Master's degree	80	4	16	20
LLB, PhD, MD, etc.	71	7	23	30

#### EMPLOYEE EDUCATION

Locating suitable personnel is consistently mentioned as a major start-up problem. When asked specifically about difficulty in finding appropriately trained people, one in five of all new firms reports this to be a problem (about 28 percent of new firms with employees). There is, however, no relationship between the sales development patterns or export emphasis of new firms and the tendency to report major problems with finding employees with appropriate skills and training.

The types of training and employment that are difficult to find in the current labor pool, and which the new firms provide themselves, are presented in Table 6.5. A detailed listing of the specific occupational categories is provided in the appendix (see Tables A6.1 and A6.2) to this chapter.



Table 6.5. EMPLOYEE SKILLS, TRAINING, OR EDUCATION DIFFICULT TO FIND,  
PROVIDED BY NEW FIRMS (in percents)

	Difficult to Find	Provided by New Firms
Management	2	1
Engineers, scientists	2	1
Social scientists, lawyers, education or health professionals	1	*
Therapists, health and scientific technicians	8	3
Sales, clerical, service	14	13
Mechanical, construction, precision production	13	8
Production, transportation, labor	4	5
Other: general training or not specified	56	68

Note: The asterisk indicates less than 0.6 percent.

It is clear that the major types of problems are not indicated, or are so specific to the new firm and the way it operates that standard job titles do not provide an appropriate label. Most of those that can be labeled are those requiring an intermediate level of commitment. Only a small percentage are in managerial, administrative, or professional categories. In particular, the training provided within the new firm tends to focus on those jobs most easily acquired through on-the-job experiences.

A variety of post-high school educational systems serve the state of Minnesota. The respondents were asked which types of "retraining or additional experience" each type might provide for the firm's "managers, staff, or employees." The responses are summarized in Table 6.6. The details of the occupational categories specific to each type of educational institution are given in Tables A6.3 through A6.6 following this chapter.

The results suggest a systematic conception of research universities and four-year colleges as most suited for additional training related to management, scientific, professional jobs; two-year colleges as most suited to additional training for technicians and sales, clerical, and service jobs; and vocational/technical institutions most suited to craftspersons, production, or transportation-related positions. The high number of responses related to the vocational/technical institutions (equal to the total of responses for the other three alternatives) suggests a well-defined image of the types of educational value that may be provided by such institutions.

Table 6.6. EDUCATIONAL INSTITUTIONS AND APPROPRIATE TRAINING OR RETRAINING  
(in percents)

	Research University	Four-Year College	Two-Year College	Voc/Tech Schools.
Total responses	107	131	115	350
Management	3	6	2	*
Engineers, scientists	12	4	1	2
Social scientists, lawyers, edu- cation or health professionals	2	--	1	*
Therapists, health and scientific technicians	12	5	12	11
Sales, clerical, service	18	16	24	19
Mechanical, construction, precision production	1	5	6	24
Production, transportation, labor	3	--	--	6
Other: general training or not specified	50	64	54	38
	101	100	100	100

Note: The asterisk indicates less than 0.6 percent.

#### EDUCATIONAL SERVICE USE AND CONTRIBUTIONS

New firms were asked to indicate the extent of use of services that may be available from state, regional, or government agencies or programs. Unfortunately, only a small number completed this item, at the bottom of the fifteenth page of a long questionnaire. However, the use of two educational institutions was indicated by a small number of respondents. The character of the firms they represented is presented in Table 6.7.

Table 6.7. USE OF EDUCATIONAL PROGRAMS AND NEW FIRM CONTRIBUTIONS

	Number of Firms	1986 Jobs	1985 Sales (\$1,000)	1985 Exports (\$1,000)	Percent Exporting	Percent High Growth.
AVTI	45	7.9	267	53	13	27
Community college	26	12.6	606	257	22	35
No use reported	619	8.8	549	100	18	27
Use not known	440	9.5	541	111	15	25

Although the sample of program users is small, and no information is available for 40 percent of the sample, the strong pattern related to use of community college programs deserves some comment. These are clearly new firms making major contributions; average jobs, sales, and exports are substantially greater than for the typical firm, and a greater percentage are both high growth and exporting. New firms reporting use of community college programs also report substantially greater contributions.

Unfortunately, the nature of the use of these programs is unknown. The community college programs could have been a source of training and education for the members of the start-up team or the employees; they could have been extensive formal programs or weekend workshops. But whatever the program, the community college system may be serving a group of new firms that are making substantial contributions to the economy. In contrast, the AVTI programs appear to serve a larger number of more traditional new firms. Both systems contribute to the success of new firms, but in different ways.

#### SUMMARY

It is clear that those starting new firms report varying degrees of educational attainment; it is equally clear that major contributions come from new firms associated with all levels of educational attainment. Ironically, new firms started by those completing advanced graduate programs make the most modest contributions, both individually and in the aggregate.

Locating suitably trained and experienced personnel is a major problem for new firms, and a continuing problem for growing new firms. New firm principals seem to consider that some of their needs can be met by existing educational institutions; it is clear that much training is provided by the firms themselves. Established occupational categories--which are constantly changing--do not provide adequate descriptions for the majority of the unmet training needs of the new firms. This probably reflects a lag in the revision of these categories as well as the idiosyncratic job descriptions developed within these new firms.

A tentative analysis of a small sample of new firms that reported use of the community college and AVTI systems was possible. Not many had used the community college system, but these firms were making substantial contributions to Minnesota. Almost twice as many new firms reported using the AVTI system; their contributions to Minnesota were typical of all new firms.

There are several implications from this analysis for the policies that may guide the educational systems in Minnesota. First, entrepreneurial training or programs oriented toward starting a new firm are appropriate for educational systems at all levels. Substantial contributions (jobs, sales, and exports) are made by firms initiated by those with all levels of educational attainment. However, these programs might be tailored to the type of new firm most typical of those completing different levels of education. New firms oriented toward local markets (particularly construction, retail, and consumer services) might be emphasized in high school and AVTI programs. This could be expanded to export-oriented industries at the four-year and research

university institutions.<sup>2</sup>

Second, entrepreneurial training should include a discussion not only of local, state, and federal regulations and assistance but also of current sources of government support. Confusion and complications associated with government regulations are one of the most frequent sources of dissatisfaction among those starting new firms. Stressing techniques for obtaining government assistance in meeting legal and administrative criteria would be of particular value.

Third, educational institutions providing trained, skilled employees should probably approach individual firms and discuss their specific needs. While locating suitable employees is a major problem for new firms, each firm's needs seem unique. More than half the new firms could not describe their employment needs with established job titles. Substantial job training occurs within new firms, and major educational systems might make a significant contribution by developing specialized programs tailored to the job requirements of specific firms. Such efforts may be justified only for those firms with a high potential for job growth.

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<sup>2</sup> This is, to some extent, already the case.

Table A6.1. DIFFICULT-TO-FIND EMPLOYEE SKILLS: DETAILED OCCUPATIONS

Category Label	Code	Count	Percent of Responses	Percent of Valid Cases
Management, not specified	2	1	0.2	0.3
Word processing	6	1	0.2	0.2
Problem, not specified	10	7	0.2	2.3
Product knowledge	12	4	1.1	1.5
Sales, not specified	14	28	6.8	9.3
Telephone experience	15	1	0.0	0.1
Personal qualities	20	6	1.4	1.9
Motivated workers	21	42	10.1	13.9
Willingness to learn	22	9	2.1	2.9
Flexible workers	23	5	1.2	1.7
Good social skills	26	17	4.1	5.6
Other personal qualities	29	19	4.5	6.2
Cannot afford	30	8	1.9	2.6
No one wants to work	40	1	0.2	0.2
Experienced workers, not specified	50	40	9.7	13.3
Well-rounded experience	51	2	0.6	0.8
Reading, writing, math	52	9	2.1	2.9
Experience, other	59	6	1.5	2.1
General managers, top executives	121	4	1.0	1.4
Purchasing managers	124	1	0.3	0.5
Managers: medical, health	131	1	0.2	0.2
Accountants, auditors, financial specialists	141	1	0.2	0.2
Management occupations, not elsewhere classified	149	1	0.2	0.2
Architects	161	1	0.2	0.2
Engineers	162	1	0.2	0.2
Engineers	163	5	1.1	1.6
Computer scientists	171	1	0.0	0.1
Life scientists	185	1	0.0	0.1
Social scientists	191	1	0.1	0.1
Social and recreation	203	2	0.4	0.5
Lawyers	211	1	0.2	0.2
Pre-school and kindergarten	231	1	0.2	0.3
Teachers, not elsewhere classified	239	1	0.2	0.3
Health practitioners, not elsewhere classified	289	1	0.1	0.1
Registered nurses	290	1	0.2	0.2
Pharmacists	301	6	1.4	1.9
Therapists	303	2	0.5	0.7
Designers	322	3	0.8	1.1
Visual artists	325	1	0.3	0.4
Arty types, not elsewhere classified	329	1	0.1	0.1
Editors and reporters	331	1	0.2	0.2
Clinical lab technicians	362	1	0.2	0.2
Health technicians, not elsewhere classified	369	1	0.2	0.2
Engineering technicians	371	6	1.5	2.1
Drafting occupations	372	2	0.4	0.5
Mathematical technicians	384	1	0.2	0.2
Legal technicians	396	1	0.2	0.2



Category Label	Code	Count	Percent of Responses	Percent of Valid Cases	
Programmers		397	7	1.7	2.4
Technicians, not elsewhere classified		399	1	0.0	0.1
Insurance, real estate, sales		412	2	0.6	0.8
Business service sales		415	5	1.3	1.8
Technical sales workers		423	1	0.2	0.2
Sales representatives		424	1	0.2	0.2
Salespersons, retail		434	2	0.4	0.5
Retail sales		435	3	0.6	0.9
Sales occupations, other		436	4	0.9	1.2
Computer equipment operators		461	4	1.1	1.5
Secretary and typist		462	7	1.7	2.3
Record clerks		469	1	0.0	0.1
Financial record processor		471	2	0.5	0.7
Recording, distributing clerks		475	1	0.1	0.1
Miscellaneous administrative support		479	1	0.2	0.3
Food services		521	17	4.2	5.8
Building services, not household		524	2	0.4	0.5
Personal/service occupations		525	6	1.4	1.9
Farmers--working owner		551	1	0.2	0.2
Farm occupations, except management		561	1	0.2	0.2
Related agricultural occupations		562	4	0.9	1.2
Timber cutting		573	1	0.2	0.2
Vehicle mechanics		611	14	3.5	4.7
Electrical equipment repair		615	1	0.2	0.3
Miscellaneous mechanical and repair		617	3	0.7	1.0
Carpenters and related		642	2	0.5	0.7
Paint, paper and plaster		644	1	0.2	0.3
Plumbing, pipe and steam		645	7	1.6	2.2
Other construction		646	1	0.3	0.5
Precision metal workers		681	4	0.9	1.2
Precision metal workers		682	2	0.4	0.5
Precision woodworkers		683	3	0.7	1.0
Precision printing		684	3	0.8	1.1
Precise textile workers		685	6	1.4	1.9
Precision worker, assorted		686	1	0.4	0.5
Precision food production		687	3	0.7	1.0
Metal fab setup operators		733	1	0.2	0.2
Metal and plastic setup		734	1	0.2	0.3
Metal and plastic operators		751	2	0.4	0.5
Miscellaneous metal/plastic		752	1	0.2	0.2
Metal fab machine operators		753	1	0.1	0.2
Woodworking machine operators		763	1	0.2	0.3
Printing machine operators		764	1	0.0	0.1
Textile machine operators		765	3	0.7	1.0
Welders and solderers		771	1	0.3	0.4
Motor vehicle operators		821	2	0.4	0.5
Material moving equipment		831	3	0.7	1.0
Helpers, mechanics		863	1	0.2	0.2
Cannot code		888	19	4.7	6.5
Other		900	10	2.5	3.4

Table A6.2. TRAINING OR EDUCATION PROVIDED BY NEW FIRMS:  
DETAILED OCCUPATIONS

Category Label	Code	Count	Percent of Responses	Percent of Valid Cases
Company management	2	3	0.3	0.4
Supervision, not specified	4	4	0.4	0.6
Word processing	7	1	0.1	0.1
On-the-job training	10	128	12.8	18.0
Informal training	11	82	8.3	11.6
Product/service training	12	68	6.8	9.6
Sales experience	14	118	11.8	16.6
Telephone experience	15	6	0.6	0.9
Time management	17	4	0.4	0.5
New technology	18	2	0.2	0.3
Other training	19	14	1.4	1.9
School, voc/tech, etc.	20	35	3.5	4.9
Company courses	21	23	2.3	3.2
Orientation	22	4	0.4	0.5
Apprenticeships	23	27	2.7	3.8
Internships	24	2	0.2	0.3
Seminars, inservice	25	29	2.9	4.1
Tapes, manuals	26	22	2.2	3.1
Training, not elsewhere classified	29	1	0.0	0.0
Customer service communications	30	23	2.3	3.3
Purchasing managers	124	1	0.1	0.1
Managers, medical and health	131	1	0.1	0.1
Construction managers	133	1	0.1	0.1
Managers: service organizations	135	1	0.1	0.1
Accountants, auditors, financial specialists	141	3	0.3	0.4
Management analysts	142	1	0.1	0.1
Inspection compliance officer	147	1	0.1	0.1
Management occupations, not elsewhere classified	149	3	0.3	0.4
Architects	161	1	0.1	0.1
Engineers	162	1	0.1	0.2
Engineers	163	4	0.4	0.5
Life scientists	185	1	0.1	0.1
Social scientists	191	1	0.0	0.0
Lawyers	211	1	0.1	0.1
Teachers, not elsewhere classified	239	1	0.1	0.1
Health practitioner, not elsewhere classified	289	1	0.0	0.0
Therapists	303	2	0.2	0.3
Physicians' assistants	304	1	0.2	0.2
Designers	322	3	0.3	0.4
Visual artists	325	1	0.0	0.0
Photographers	326	3	0.3	0.5
Editors and reporters	331	2	0.2	0.3
Clinical lab technicians	362	1	0.1	0.1
Radiologic technicians	365	1	0.1	0.1
Health technicians, not elsewhere classified	369	1	0.1	0.2
Engineering technicians	371	4	0.4	0.5

Category Label	Code	Count	Percent of Responses	Percent of Valid Cases
Drafting occupations	372	2	0.2	0.2
Chemical and nuclear technicians	383	3	0.3	0.4
Legal technicians	396	1	0.0	0.0
Programmers	397	7	0.7	1.0
Supervisor: retail sales	403	3	0.3	0.4
Insurance, real estate, sales	412	5	0.5	0.6
Business service sales	415	2	0.2	0.3
Retail sales	435	3	0.3	0.5
Sales occupations: other	436	9	0.9	1.3
Computer equipment operators	461	17	1.7	0.6
Secretaries and typists	462	4	0.4	0.6
General office occupations	463	3	0.3	0.4
Information clerks	464	2	0.2	0.3
Record clerks	469	1	0.1	0.1
Financial record processing	471	28	2.8	3.9
Mail and message distribution	474	1	0.1	0.1
Recording distributing clerks	475	7	0.7	0.9
Adjusters, investigators, collectors	478	1	0.0	0.1
Food service	521	34	3.5	4.9
Health service occupations	523	2	0.2	0.3
Building service, not household	524	3	0.3	0.4
Personal service occupations	525	1	0.0	0.0
Personal services	526	4	0.4	0.5
Farm occupations, except management	561	2	0.2	0.3
Related agricultural occupations	562	5	0.5	0.7
Vehicle mechanics	611	4	0.4	0.5
Industrial machine repair	613	4	0.4	0.5
Machinery repair	614	4	0.4	0.6
Electronic equip repair	615	3	0.3	0.5
Miscellaneous mechanical and repair	617	9	0.7	0.9
Brick and stone masons	641	3	0.3	0.4
Carpenters and related	642	4	0.4	0.6
Paint, paper and plaster	644	3	0.3	0.4
Plumb, pipe and steam	645	8	0.8	1.2
Other construction	646	6	0.6	0.9
Precision metal workers	681	5	0.5	0.7
Precision metal work	682	2	0.2	0.2
Precision woodworkers	683	2	0.2	0.3
Precision printing	684	8	0.8	1.1
Precise textile work	685	3	0.3	0.5
Precision workers; assorted	686	5	0.5	0.7
Precision food production	687	6	0.6	0.8
Metal and plastic setup	731	2	0.2	0.3
Metal and plastic setup	734	1	0.1	0.2
Woodworking setup	743	2	0.2	0.3
Assorted materials; setup	746	1	0.1	0.1
Metal and plastic operators	751	2	0.2	0.3
Metal fab machine operators	753	1	0.1	0.2
Metal and plastic processors	754	2	0.2	0.2

<u>Category Label</u>	<u>Code</u>	<u>Count</u>	<u>Percent of Responses</u>	<u>Percent of Valid Cases</u>
Woodworking machine operators	763	1	0.1	0.1
Printing machine operators	764	1	0.1	0.1
Textile machine operators	765	3	0.3	0.4
Welders and solderers	771	3	0.3	0.5
Assemblers	772	3	0.3	0.4
Supervisor: motor equipment operators	811	1	0.1	0.1
Motor vehicle operators	821	12	1.2	1.8
Pilots and navigators	825	1	0.1	0.1
Material moving equipment	831	7	0.7	0.9
Helpers; machine operators	861	1	0.1	0.1
Freight movers; hand	872	5	0.5	0.7
Garage and service station	873	3	0.3	0.4
Miscellaneous manual occupations	876	1	0.0	0.0
Cannot code	888	41	4.1	5.8
Other	900	21	2.1	3.0
Hire only experienced	910	25	2.5	3.6

Table A6.3. RETRAINING OR ADDITIONAL EDUCATION APPROPRIATE FOR RESEARCH  
UNIVERSITY: DETAILED OCCUPATIONS

Value Label	Code	Count	Percent of Cases	Percent of Valid Cases
Training needed, not specified	001	14	1.2	12.6
Company management	002	19	1.7	17.8
Company started class	003	1	.1	.6
Supervision, not specified	004	1	.1	.7
Reading, writing, math	005	1	.1	.9
Sales experience	012	2	.2	1.6
Telephone experience	014	1	.1	.7
Seminars, inservice	023	7	.6	6.1
Financial managers	134	1	.1	.6
Managers; marketing, advertizing and PR	135	2	.1	1.4
Managers; mining, etc.	133	1	.1	.7
Architects	161	1	.1	.8
Engineers	162	9	.8	7.8
Life scientists	185	3	.3	3.0
Social scientists	191	1	.1	.9
Lawyers	211	1	.1	.6
Health practitioners, not elsewhere classified	289	1	.1	.9
Physicians' assistants	304	1	.1	.7
Designers	322	3	.3	2.7
Visual artists	325	3	.3	2.7
Clinical lab technicians	362	1	.1	.7
Dental hygienists	363	1	.1	.7
Programmers	397	4	.4	4.0
Insurance, real estate, sales	412	1	.1	1.3
Business service sales	415	11	1.0	10.2
Sales representatives	424	1	.1	.7
Computer equipment operators	461	1	.1	1.4
Financial record processing	471	5	.4	4.3
Farm managers	501	1	.1	.7
Textile machinery operators	765	3	.3	2.7
Cannot code	888	7	.6	6.8
Other	900	2	.2	2.2
No training	000	819	73.2	Missing
No employees	777	151	13.5	Missing
Refused to answer	999	42	3.7	Missing



Table A6.4. RETRAINING OR ADDITIONAL EDUCATION APPROPRIATE FOR FOUR-YEAR COLLEGES: DETAILED OCCUPATIONS

Value Label	Code	Count	Percent of Cases	Percent of Valid Cases
Training needed, not specified	001	13	1.2	9.9
Company management	002	37	3.3	28.0
Company started class	003	0	.0	.2
Supervision, not specified	004	1	.1	.7
Word processing	011	1	.1	.5
Product/service training	012	1	.1	.6
Sales experience	014	14	1.2	10.4
Company courses	021	1	.1	.6
Apprenticeships	023	1	.1	.6
Seminars, inservice	025	7	.6	5.0
General managers and top executives	130	1	.1	.6
Managers: marketing, advertising, and PR	131	1	.1	1.1
Managers: medical and health	133	1	.1	1.0
Management analysts	134	1	.1	.6
Management occupations, not elsewhere classified	139	3	.3	2.4
Engineers	162	1	.1	1.1
Engineers	163	2	.2	1.6
Physical scientists	175	1	.1	.6
Life scientists	185	1	.1	.6
Registered nurses	290	1	.1	.6
Authors	321	1	.1	.6
Designers	322	2	.1	1.1
Editors and reporters	331	1	.1	.6
Health technicians, not elsewhere classified	362	1	.1	.6
Programmers	397	3	.2	2.0
Insurance, real estate, sales	412	2	.2	1.6
Business service sales	415	10	.9	7.5
Computer equipment operators	461	1	.1	.6
Financial record processing	471	7	.6	5.3
Personal services	525	1	.1	.5
Farmers--working owners	551	3	.3	2.2
Farm managers	552	2	.1	1.2
Farm occupations, except management	561	1	.1	.6
Other construction	646	1	.1	.5
Precision worker; assorted	686	1	.1	.6
Cannot code	888	7	.6	5.0
Other	900	3	.3	2.3
No training	000	795	71.0	Missing
No employees	777	151	13.5	Missing
Refused to answer	999	42	3.7	Missing

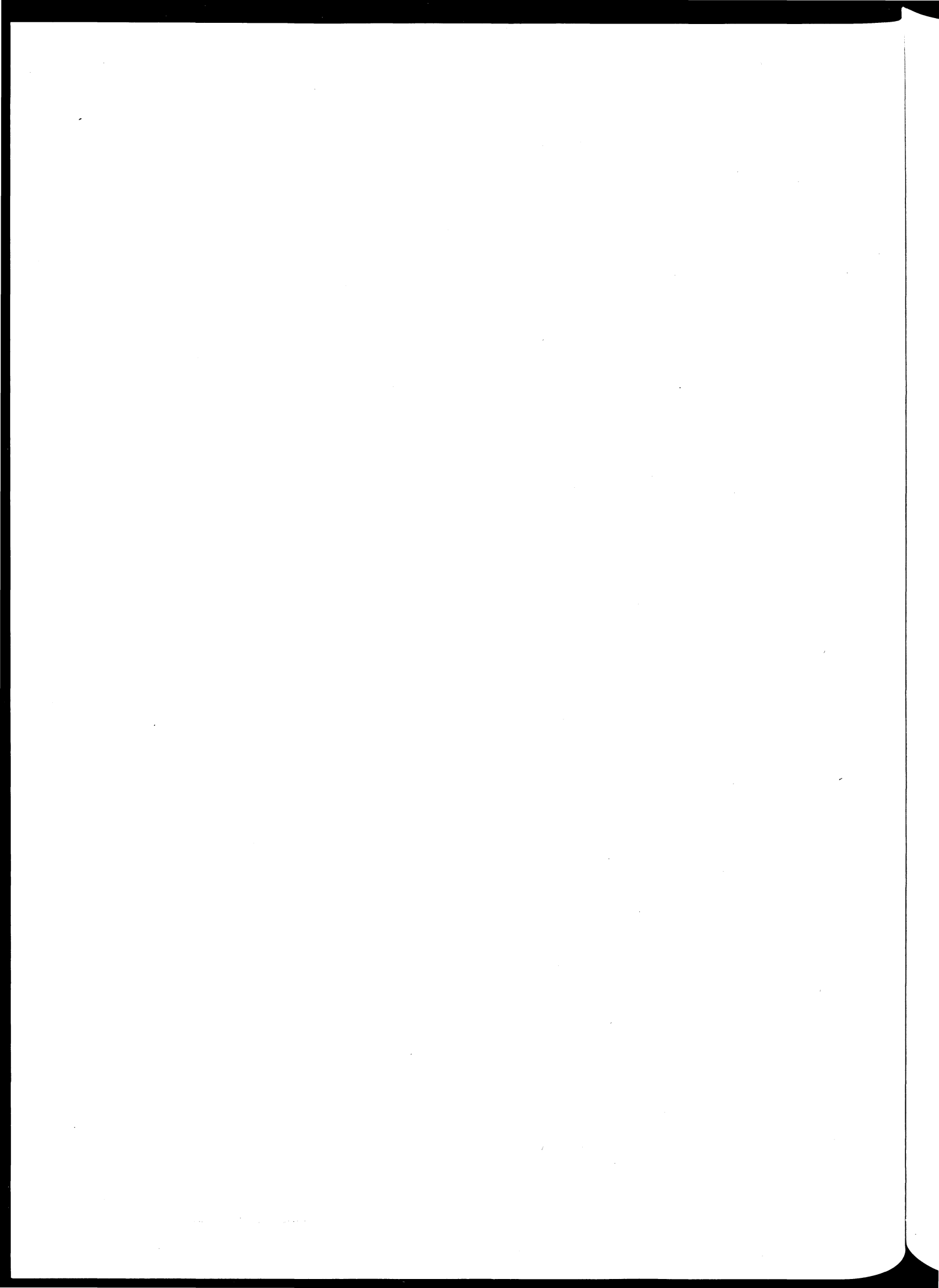
Table A6.5. RETRAINING OR ADDITIONAL EDUCATION APPROPRIATE FOR COMMUNITY COLLEGES: DETAILED OCCUPATIONS

Value Label	Code	Count	Percent of Cases	Percent of Valid Cases
Training needed, not specified	001	19	1.7	16.8
Company management	002	19	1.7	16.1
Company started class	003	1	.1	.8
Supervision, not specified	004	2	.1	1.3
Reading, writing, math	005	2	.2	1.5
On-the-job	010	1	.1	.7
Product/service training	012	3	.2	2.4
Sales experience	014	2	.2	1.5
Seminars, inservice	025	6	.5	5.0
Customer service communications	030	3	.3	2.5
General managers and top executives	031	1	.1	1.3
Accountants, auditors, financial specialists	041	1	.1	.8
Engineers	162	1	.1	.7
Life scientists	185	1	.1	.7
Pre-school and kindergarten	231	1	.1	.7
Therapists	303	1	.1	.6
Physicians assistants	304	1	.1	.7
Editors and reporters	331	1	.1	.7
Public relations specialists	333	1	.1	1.2
Licensed practical nurses	341	1	.1	.6
Health technicians	369	1	.1	.6
Engineering technicians	371	2	.2	1.5
Programmers	397	5	.5	4.4
Technicians, not elsewhere classified	399	1	.1	.6
Business service sales	415	4	.4	3.7
Sales representatives	423	1	.1	.6
Sales occupations, other	435	1	.1	.6
Computer equipment operator	461	3	.3	2.5
Secretary and typists	462	1	.1	.9
Information clerks	464	1	.1	.7
Financial record processing	471	12	1.0	10.2
Miscellaneous administrative support	479	1	.1	.9
Food service	521	1	.0	.5
Personal service occupations	525	3	.3	2.5
Personal services	529	1	.1	.6
Farm manager	560	2	.1	1.3
Related agricultural occupations	562	1	.1	.6
Brick and stone masons	461	1	.1	.8
Carpenters and related	462	3	.3	2.5
Precision metal workers	681	1	.1	.7
Cannot code	888	6	.5	4.9
Other	900	1	.1	.7
No training	000	812	72.5	Missing
No employees	777	151	13.5	Missing
Refused to answer	999	42	3.7	Missing

Table A6.6. RETRAINING OR ADDITIONAL EDUCATION APPROPRIATE FOR VOCATIONAL/  
TECHNICAL INSTITUTIONS: DETAILED OCCUPATIONS

Value Label	Code	Count	Percent of Cases	Percent of Valid Cases
Training needed, not specified	001	66	5.9	18.8
Company management	002	7	.7	2.1
Company started class	003	0	.0	.1
Supervision, not specified	004	1	.1	.2
Reading, writing, math	005	0	.0	.1
Word processing	006	1	.1	.4
On-the-job, not specified	010	1	.1	.4
Informal training	011	1	.1	.2
Travel experience	012	1	.1	.2
Sales experience	014	12	1.1	3.5
Seminars, inservice	023	4	.4	1.2
Training, not elsewhere classified	029	3	.2	.8
Customer service communication	030	1	.1	.3
Reading, writing	039	1	.1	.2
Managers, service organizations	132	1	.1	.3
Engineers	162	4	.4	1.2
Surveyors and map scientists	172	1	.1	.2
Life scientists	185	2	.2	.6
Pre-school and kindergarten	231	1	.1	.2
Physicians' assistants	281	1	.1	.2
Designers	322	2	.2	.7
Visual artists	325	2	.1	.4
Photographers	326	3	.2	.8
Public relations specialists	327	1	.1	.2
Health technicians, not elsewhere classified	369	1	.1	.2
Engineering technicians	371	10	.9	3.0
Drafting occupations	372	6	.6	1.8
Chemical and nuclear technicians	373	4	.3	1.0
Legal technicians	396	1	.1	.2
Programmers	397	8	.7	2.3
Supervision: insurance, etc.	410	1	.1	.4
Insurance, real estate, sales	412	0	.0	.1
Business service sales	415	1	.1	.2
Sales representatives	424	1	.1	.2
Retail sales	435	3	.2	.7
Sales occupations, other	436	1	.1	.2
Computer equipment operators	461	10	.9	3.0
Secretary and typist	462	7	.7	2.1
General office occupations	463	3	.3	.8
Information clerks	464	2	.1	.4
Financial record processor	471	11	1.0	3.2
Mail and message distribution	474	1	.1	.2
Recording, distribution clerks	475	1	.1	.2
Adjusters, investigators, collectors	478	0	.0	.1
Miscellaneous administrative support	479	1	.1	.3

Value Label	Code	Count	Percent of Cases	Percent of Valid Cases
Food service	521	10	.9	2.9
Health service occupations	523	2	.1	.4
Building services, not household	524	0	.0	.1
Personal service occupations	525	12	1.0	3.3
Personal services	526	1	.1	.2
Farmers--working owners	551	3	.3	.8
Farm managers	557	2	.1	.4
Farm occupations, except manangement	561	0	.0	.1
Related agricultural occupations	562	1	.1	.4
Vehicle mechanics	611	17	1.5	4.9
Industrial machine repair	613	4	.4	1.2
Electrical equipment repair	615	15	1.4	4.4
Miscellaneous mechanical and repair	617	4	.3	1.1
Carpenters and related	642	4	.4	1.3
Electricians and power trans. installers	643	3	.3	.8
Paint, paper, and plaster	644	3	.3	.8
Plumbers, pipe and steam	645	1	.1	.2
Other construction	646	4	.4	1.2
Construction trades	649	1	.1	.2
Precision metal workers	681	8	.7	2.4
Precision metal work	682	1	.1	.3
Precision woodworking	683	2	.2	.5
Precision printing	684	3	.3	1.0
Precision textile work	685	6	.5	1.6
Precision work; assorted	686	1	.1	.4
Precise food production	687	1	.1	.2
Metal and plastic setup	731	1	.1	.4
Metal and plastic setup	734	0	.0	.1
Woodworking setup	743	1	.1	.2
Metal and plastic operators	744	3	.2	.8
Miscellaneous metal and plastic	746	1	.1	.2
Metal fab machine operators	751	1	.1	.2
Printing machine operators	764	1	.1	.2
Textile machine operators	765	3	.2	.8
Operators; assorted materials	766	1	.1	.2
Welders and solderers	771	3	.3	1.0
Motor vehicle operators	821	2	.2	.7
Material moving equipment	831	3	.3	.8
Supervisors: handlers, laborers	840	0	.0	.1
Cannot code	888	24	2.2	7.0
Other	900	7	.6	2.0
No training	000	575	51.4	Missing
No employees	777	151	13.5	Missing
Refused to answer	999	42	3.7	Missing





## Chapter 7

### SUMMARY AND IMPLICATIONS

Policymakers concerned with new firms and economic development are confronted with several decisions regarding appropriate strategies. The first decision is, *Should public resources be devoted to enhancing new firms?*

If the answer is yes, three strategies are available:

- I. Improve the regional and institutional features important to new firms. An improved "business climate" will benefit all new firms and may, in turn, facilitate economic development.
- II. Provide assistance to specific high-potential new firms, those that may make the greatest contributions (direct and indirect) to economic development and regional well-being.
- III. Implement a combination of these two strategies.

This study of the new firms established in Minnesota between 1979 and 1984 and surviving into 1986 provides information relevant to these issues.

#### MAJOR FINDINGS

Analysis of the contributions of new firms suggested the following:<sup>1</sup>

1. New Minnesota firms established between 1979 and 1984 provided 6-14 percent of the 1986 jobs and 5-12 percent of the 1985 personal income. Their contributions were equal to 42-99 percent of the net growth in jobs between 1978 and 1986 and 12-29 percent of the net growth in personal income (p. 1).
2. New firms in all major industries were important sources of jobs and sales (p. 6).
3. New firms in manufacturing, distributive services (wholesale), and business services were important as sources of out-of-state exports (p. 6).
4. Most new firms' contributions occur in the Minneapolis-St. Paul region, but new firm jobs are a larger proportion of existing jobs in the Greater Minnesota regions (pp. 7-8).

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<sup>1</sup> Report page numbers are given in parentheses.

From five to ten thousand new firms are founded in Minnesota each year (p. 16). Examination of the patterns of new firm birth rates across the thirteen regions of Minnesota indicated that:

5. Birth rates of new firms in export-potential industries have a modest relationship to the birth rates of new firms in local-market industries (p. 19).
6. The founding of new firms in export-potential industries--manufacturing, distributive services, business services--tends to be highest in regions with higher proportions of college graduates, higher per capita income, and more midcareer adults (p. 20).
7. The emergence of new firms in local-market industries--agriculture, mining, construction, retail, consumer services--is not significantly related to the major region characteristics. It may be more uniform, reflecting a pervasive turnover of firms in these industries (p. 21).

Analysis of those factors related to variation in contributions (particularly jobs and sales) provided by all new firms indicated that:

8. The major factors that accounted for 55 percent of the variation in the 1986 employment of new firms were the absence of managers and professionals in the start-up year, the number of start-up problems, total informal financial resources, total employees in the first year, proportion of unskilled employees, current management focus on marketing, importance of local labor markets, sales emphasis on out-of-state exports, average sales growth in first years, and average initial working capital loan (p. 29).
9. The major factors accounting for 42 percent of the variation in 1985 sales were sales growth in the early years, number of start-up problems with employment, total informal financial resources, percentage of start-up team working forty to sixty hours per week, percentage of start-up financial problems solved, percentage of males on start-up team, percentage of costs for materials, importance of local labor markets, number of start-up problems with financing, and sales in the first year (p. 29).

New firms were classified in several different ways to determine their relative level of contributions:

10. New firms were classified into four types based on developmental patterns. Those with high annual sales growth (over \$100,000 per year) were 24 percent of the new firms and provided 60 percent of the jobs and 80 percent of both sales and exports. The low-growth firms were the dominant type in every industry sector. High-growth firms are more prevalent in urbanized regions (pp. 31-34).
11. New firms were classified in terms of their export orientation: 80 percent emphasized intrastate sales, 12 percent to adjoining states, and 8 percent national. Four of five export-oriented firms were from manufacturing, distributive services, or business services. They were 20 percent of all firms and provided 31 percent of the jobs, 45 percent of

the sales, and 96 percent of all exports. They tended to be located in major urban areas (pp. 36-38).

12. High-growth firms with an export emphasis were 13 percent of the sample and accounted for 24 percent of the jobs, 38 percent of the sales, and 81 percent of the exports provided by the sample of new firms (pp. 38-39).

Analysis of the start-up problems reported by those initiating new firms indicated that:

13. Start-up problems fell into several major categories: financial support, marketing strategy, cash management, government relations, development and implementation of planning, acquiring personnel and maintaining cohesion, site factors, access (to customers, clients, suppliers), and features of the infrastructure (p. 49).
14. There is a consistent positive relationship between the number and severity of start-up problems and contributions (jobs, sales, and exports); the greater the contributions, the more start-up problems are reported (p. 52).
15. The more start-up problems reported as solved, the greater the current contributions of the new firm (p. 53).

Consideration of the reaction of those responsible for new firms to their local context and potential government programs and services indicated that:

16. Virtually all new Minnesota firms are started by established residents. They suggest knowledge of the area and local industry and well-developed family and business relations are of major importance. No one in the sample moved to Minnesota to start a new business (p. 55).
17. The most important features of the local context are access to customers, least important was land availability and access to research and development facilities (p. 57).
18. Satisfaction with most infrastructure features tends to be high (higher for the more important features). The only major exception is taxes, considered both important and universally unsatisfactory (pp.58-59).
19. The typical firm indicated high interest in four of thirty-one services that might be provided by state, regional, or local governments. Each new firm had a distinctive set in which they were interested, and all potential services received high interest from a substantial number of new firms. Two types of services--financial support and management/entrepreneurial training--received the largest percentage of high interest (p. 66-67).

Special attention was given to the relationship between education and the initiation of new firms. The major patterns found in the analysis indicated that:

20. About one-third of all new firm contributions come from firms initiated by those with education beyond high school (vocational/technical training,

associate degrees, some college experience); about one-third by those with college degrees; one-sixth by those with high school experience (with and without degrees); and about one-sixth with graduate experience (with and without degrees) (p. 71).

21. Those responsible for new firms consider a variety of educational institutions as suitable sources of retraining or additional experience for their employees; most frequently mentioned are the AVTI schools as a source of training for craft, technical, and service skills (p. 77).
22. Those new firms reporting use of community colleges also report somewhat greater jobs, sales, and exports and are more likely to report high growth and an export emphasis (p. 77).

### IMPLICATIONS

There seems to be little doubt that new firms are one major source of jobs, sales, and exports for Minnesota. Attention to the problems and needs of new firms could provide benefits to the state.

General programs to assist all new firms may have a positive impact, but given the large number of new firms initiated annually (up to 10,000) and the multitude of factors affecting their contributions, the impact or efficiency of such programs may be difficult to determine.

A small proportion of new firms (less than one-third) account for the majority of sales and jobs. An even smaller proportion (about one-sixth) account for almost all out-of-state exports. This suggests that targeting programs to these 1,500-3,000 high-potential new firms may be a cost-effective strategy for improving new firm contributions and, in turn, Minnesota's economic development.

Almost two-thirds of new firms have a modest development profile. Starting small and staying small, they are quite numerous: as many as 7,000 a year in Minnesota. A politically potent force, they may react negatively to programs geared toward high-growth new firms.

Services and programs that might be provided by state, regional, and local governments would be likely to receive a favorable reception--if the right set of services were provided for the distinctive needs of each firm. High-growth, export-oriented new firms seem to be particularly receptive to these forms of assistance.

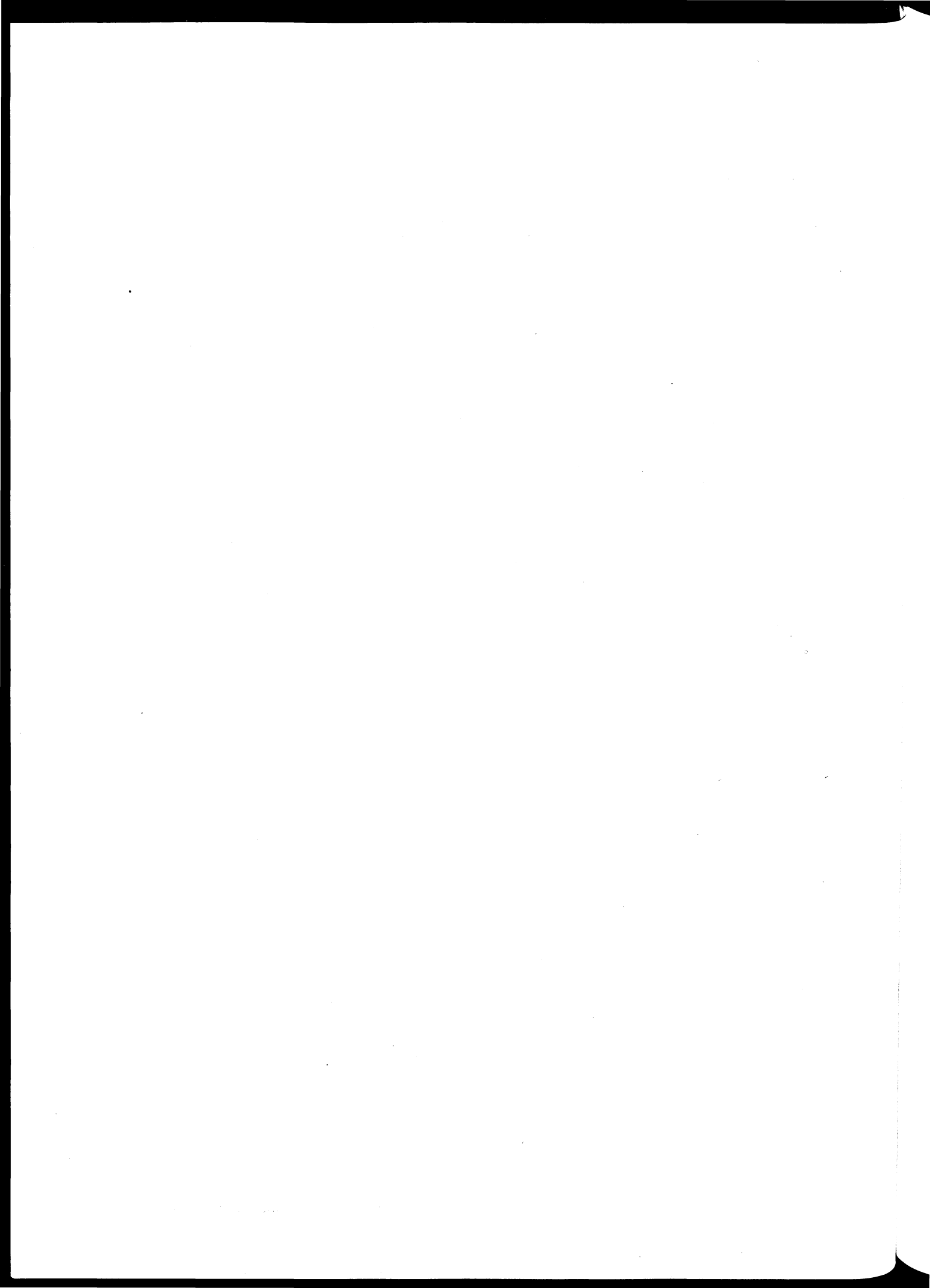
### UNRESOLVED ISSUES

In developing a full understanding of the initiation, development, and contributions of new firms, there are several unresolved issues:

- I. The ability to devise models of the initiation process in more detail, specifically the characteristics of regions that lead to variation in new firm birth rates must be developed. Such research is possible using

existing sources of data on new firm births by county, region, state, etc. Unfortunately, no data on new firm births--even for the entire United States--are available for past years.

- II. Techniques for identifying firms with high potential for growth and/or exports must be refined. Procedures that would be useful for public programs designed to locate and assist new firms with a high potential for contributions. (The success at locating them for this research project is encouraging.)
- III. This analysis has been based on data collected at one point in time, and development patterns were inferred from historical reports from the new firms. The accuracy of the predictions and the future survival of new firms can best be explored with a longitudinal study design. Perhaps involving follow-up surveys at two-year intervals.
- IV. Two special categories of new firms may bear closer examination, with detailed case studies or special additional surveys.
  - A number of high-growth and export-oriented new firms are emerging in nonmetropolitan regions. Although small in number, their contributions may be quite significant. Careful attention to these unique firms may lead to the design of strategies (for government policy or entrepreneurs) that may increase their frequency and success.
  - Firms emphasizing the use or development of new or high technology are included in the sample. Small in number, they are considered important as a source of new industries and, it is suspected, out of state exports. Careful attention to these new firms may highlight the extent of their contributions, special start-up problems, and any distinctive infrastructure (contextual) needs.





## Appendix A

### DEFINITIONS

#### ESTABLISHMENTS VS. ENTERPRISES (FIRMS)

There is great diversity in business firms, both in type and location throughout Minnesota. The description of different types of firms is complicated by a conceptual problem. In this report, a distinction has been made between:

**ESTABLISHMENT:** A single physical location where business is conducted or where services or industrial operations are performed (e.g., a drug store, manufacturing plant, or warehouse).

**ENTERPRISE (or FIRM):** A legal entity consisting of one or more establishments.

Differences between the two can be substantial. Four major manufacturing enterprises (firms) control hundreds of establishments in the production of automobiles. Thousands of individual establishments, each a separate legal entity, make up the auto repair industry.

Establishments are the major source of data on businesses. This includes the count of business entities and employment, provided as an annual census by the Bureau of the Census and published in *County Business Patterns*, as well as the listings supplied by Dun and Bradstreet in Dun's Marketing Identifier file.

For this reason, the analyses in these reports are based on establishments. This is not critical when dealing with new firms, most of which consist of a single establishment. But it can be misleading when considering existing business entities; the average enterprise (firm) consists of two establishments.

#### INDUSTRY CLASSIFICATION

The most widely used procedure for classifying business firms on the basis of economic activity is the Standard Industrial Classification (SIC) developed by the Bureau of Labor Statistics.<sup>1</sup> Unfortunately, the categories emphasized by the SIC are losing their value for describing the structure of the economy.<sup>2</sup> For example, the largest number of specific codes is found in manufacturing, a source of no more than 20 percent of all jobs. Even more

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<sup>1</sup> The basic document is the *Standard Industrial Classification Manual: 1972*, a slightly revised version of the 1965 manual. A modest set of changes was published in a 1977 supplement.

<sup>2</sup> A major revision of the SIC codes is now being implemented in all federal data-collection systems; *Federal Register*, October 1, 1986, pp. 35170-188.

problematic is that quite diverse and rapidly growing sectors of the economy are lumped under one heading. "Services" includes not only business and personal services but also health, education, and social services.

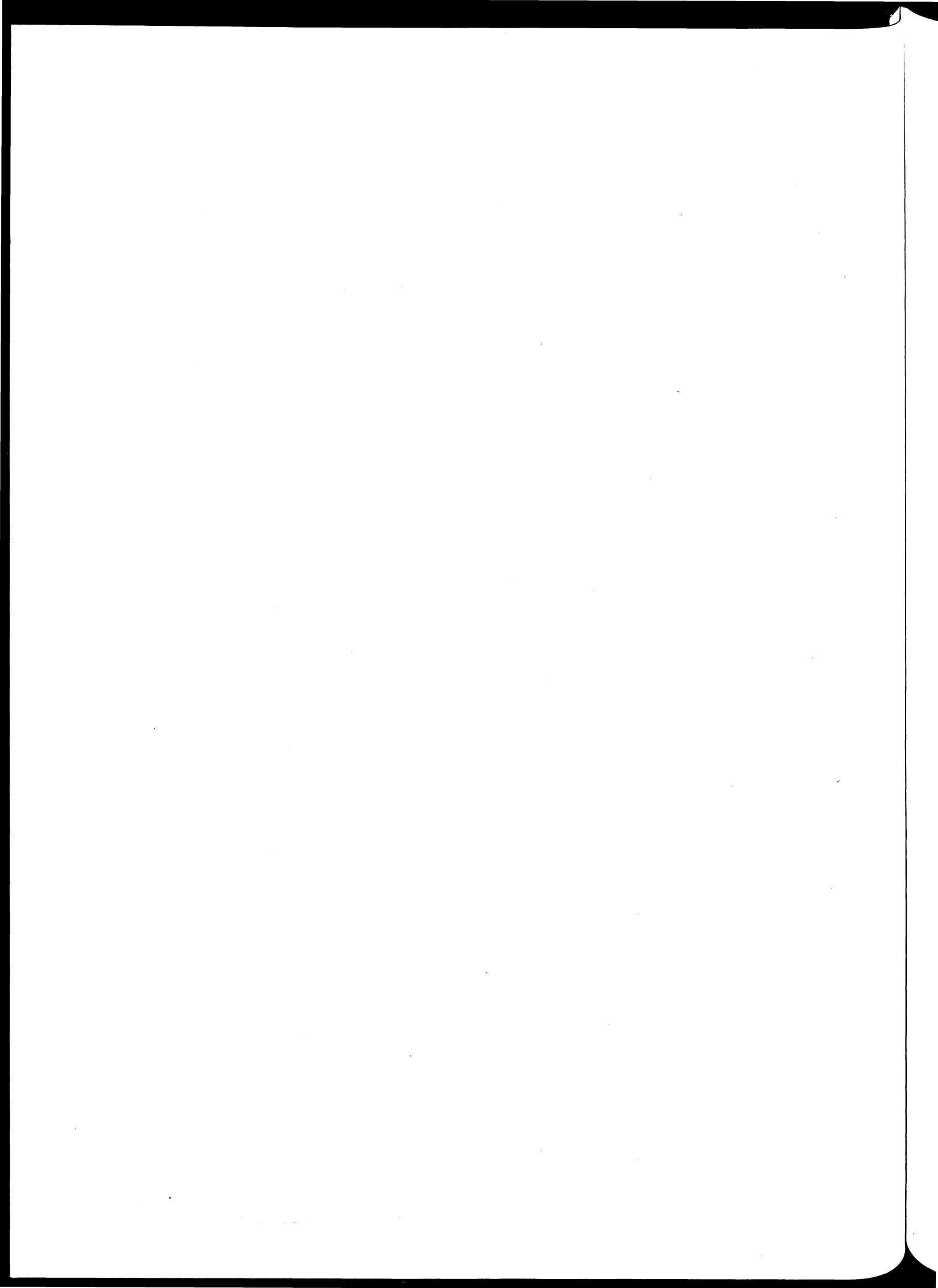
The classifications used in the analysis for this project are based on aggregations of SIC codes presented in Table A.1. Most categories--such as construction, manufacturing, and retail--are adopted without change from the most widely used descriptive schemes. Three are modified for this analysis. One is a minor consolidation. Industry sectors with a focus on distribution--of goods, people, information, energy--are classified under distributive services, combining wholesale and public utilities and transportation; wholesale establishments constitute 80 percent of this category.

The distinction between producer (or business) and consumer services is greater. The former are those industry sectors in which the major customer or client is another business--a legal person; the latter are those in which the major client is a human being--a natural person. The assignment of some specific industry sectors to producer or consumer services is a "close call." Membership organizations are placed in business services because they include professional societies and unions--but they also include churches. Hotels and lodging are placed in consumer services, but a major portion of their revenue is derived from business travelers. This also true for restaurants, which are included in the retail sector.

This is not the perfect, ultimate classification scheme, but it does provide more useful descriptions of economic activity than the categories now widely used.

Table A.1. CLASSIFICATION OF FIRM ECONOMIC EMPHASIS

Agriculture	0100-0999	Agriculture production and service, forestry, fishing
Mining	1000-1499	Mining, mining services
Construction	1500-1799	Construction of all kinds
Manufacturing	2000-3999	Manufacturing of all kinds
Distributive services	4000-4999 5000-5199	Transportation, other public utilities Wholesale of all kinds
Business services	6000-6799 7300-7399 8100-8199 8600-8699 8900-8999	Fire, insurance, and real estate Business services Legal services Membership organizations Miscellaneous professional services
Retail	5200-5999	Retail of all kinds
Consumer services	7000-7099 7200-7299 7500-7599 7600-7699 7800-7899 7900-7999 8400-8499	Hotel and lodging Personal services Auto repair, service, garages Miscellaneous repair services Motion pictures Amusement and recreation Museums, gardens, etc.
Medical, educational social services	8000-8099 8200-8299 8300-8399	Health and medical services Educational services Social services



## Appendix B

### ESTIMATING NEW FIRMS

The basic source of all estimates of new firms is the data obtained from Dun's Marketing Identifier (DMI) file provided by Dun and Bradstreet's Marketing Services. The design of the sample is presented in Table B.1. For each of six "year starts" (as indicated in the DMI file), 750 firms were selected at random from the DMI file. The sample was stratified, within each year, on two variables. For each year, 167 were to be sampled from the city of St. Paul and 583 from the rest of the state. Second, 75 percent were to be sampled from five industry sectors (either rare as a source of new firms or distinctive in their out-of-state exports) and 25 percent from three that dominate the total population of new firms. These sectors and the corresponding two-digit SIC codes are presented in Tables B.1 (Minnesota excluding St. Paul) and B.2 (St. Paul only).

Dun's Marketing Services provided a count of the total establishments listed for each "year start" for St. Paul and the rest of Minnesota, as well as for the two sample populations--twenty-four numbers in all. This is referred to as the DMI population. It is used to compute the sampling ratio: the ratio of the DMI population to the number in the sample purchased for the 1986 Minnesota new firm survey.

Table B.1 indicates the sample and sampling ratios by industry sector and DMI "year start" for Minnesota excluding St. Paul; the DMI file is estimated to have 22,692 listings that were the basis for the sample provided by Dun's Marketing Services. The same procedure, with different sampling ratios, is presented for St. Paul in Table B.2; it is estimated that 1,601 listings were in the DMI file when the sample was drawn. The total 4,497 establishment sample<sup>1</sup> is considered representative of the 24,293 establishments in the DMI population as of April 1986.

Estimates of the total number of new firms involve several changes in this basis data; they are represented in Table B.3. The first is an enhancement for the new firms not identified by the Dun and Bradstreet field staff. Estimates of the proportion of new firms missed, by age of firm and industry sector, were used to adjust for the missed new firms. These figures were derived by estimating the annual "capture" rate of new firms by the Dun and Bradstreet field staff from the rate at which new firms of different ages are

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<sup>1</sup> This was to have been 4,500, but after dividing the sample into twenty-four cells, there was some loss due to fractional numbers. Further, the population in St. Paul for some cells was less than the sample requirement. In these cells, the entire population was included in the "sample." This is reflected in the St. Paul sampling ratios that are equal to 1.00.

added to the DMI file.<sup>2</sup> It does not, unfortunately, reflect a comparison of DMI data with a complete census of business entities--such a census does not exist. These estimates appear as the "Birch correction" in each of the six years of corrections in Table B.3.

The second problem, identified in surveys of new firms, is that approximately one-half do not qualify as new firms: about 20 percent are not new firms (representing changes in ownership); about 6 percent are failed, inactive, or not businesses; about 12 percent cannot be contacted by phone after repeated attempts (more than six); about 2 percent are not businesses, duplicates, mergers; and for 6 percent no successful phone screen has been possible (refusals) (details are provided in the Methodological Appendix). Overall, it is conservative to assume that only one-half of the DMI listings are viable, autonomous, and new firms. Hence, all estimates are adjusted downward to account for this finding.

The result is the range of estimates of the number of new business entities:

	St. Paul	Rest of Minnesota	Minnesota 6-Year Total	Annual Estimates
DMI sample (April 1986)	999	3,498	4,497	750
Estimate of DMI population as of April 1986	1,601	22,692	24,293	4,048
After "Birch correction" for missed firms	--	--	56,999	9,500
After correction for DMI listings not currently viable, autonomous, and new	--	--	28,499	4,750

The most conservative estimate of new firm foundings is 4,048 per year, and the highest estimate is 9,500 per year; 4,750 per year is a reasonable modal estimate for the entire state. Systematic studies of founding rates, based on state unemployment insurance records, indicate that annual new establishment foundings of 100 per 1,000 are not unreasonable (see Chapter 2). This would be 10,000 per year for Minnesota as of 1987; the estimates above are thus conservative.

Estimates of the number of new firms in each of the thirteen regions of Minnesota follow the same procedure, with one change. Rather than compute the

<sup>2</sup> David L. Birch and Susan MacCracken, "The Small Business Share of Job Creation: Lessons Learned from the Use of a Longitudinal File" (Cambridge, Mass.: MIT Program on Neighborhood and Regional Change, mimeo., March 1983).



Birch correction, which enhances the count from the DMI file for each of six "year start dates," the average of the third- and fourth- year correction factor is used for these estimates. The small proportion of new firms in the nonmetropolitan regions of Minnesota leads to very small counts when both DMI "year start" and industry sector are being considered. The state totals resulting from the two procedures suggest a rather high level of correspondence.

	Statewide Estimate by Industry and Year Start	Regional Estimate by Industry
Minimum state total	12,140	12,059
Maximum state total	28,499	26,371

The estimates of new firm foundings in Table B.4 are used for the analysis in Chapter 1.

For the analysis in Chapter 2, estimates of new firm births for each region are based on the uncorrected estimates of the DMI population (a total of 46,400) and then divided by 6 to get an estimated annual number of new firm births. Existing establishments, used to compute new firm birth rates (births/1,000 establishments), are based on the census provided for each of Minnesota's counties in *County Business Patterns* for 1983.

Table B.1. INITIAL DMI SAMPLE AND ESTIMATES OF DMI POPULATION: MINNESOTA  
EXCLUDING ST. PAUL

DMI SAMPLE LIST	SIC Codes	Year Start in DMI File					Total	
		1979	1980	1981	1982	1983		1984
<b>SUBSET I</b>								
Agriculture	01-09							
Mining	10-14							
Manufacturing	20-39							
Distributive Services	40-51							
Business Services	60-67,73, 86,89							
H, Ed, Soc Services	80,82,83							
Total		437	437	437	437	437	437	
<b>SUBSET II</b>								
Construction	15-17							
Retail	52-59							
Consumer Services	70,72,75,76, 78,79,84							
Total		146	146	146	146	146	146	
<b>DMI POPULATION AT TIME OF SAMPLING</b>								
Subset I		1,704	1,688	1,689	1,683	1,735	1,447	9,946
Subset II		2,224	2,070	2,185	2,111	2,193	1,963	12,746
		3,928	3,758	3,874	3,794	3,928	3,410	22,692
<b>SAMPLING INTERVALS (RATIOS)</b>								
Subset I		3.90	3.86	3.86	3.85	3.97	3.31	3.79
Subset II		15.23	14.18	14.97	14.46	15.02	13.45	14.55
<b>DMI SAMPLE BY INDUSTRY</b>								
Agriculture	I	26	25	26	21	12	16	126
Mining	I	2	4	0	2	0	3	11
Construction	II	37	19	29	15	25	20	145
Manufacturing	I	111	100	92	113	118	104	638
Distributive Services	I	131	124	156	138	150	162	861
Business Services	I	152	158	143	146	134	141	874
H, Ed, Soc Services	I	15	26	20	17	23	11	112
Retail	II	77	95	90	98	100	101	561
Consumer Services	II	32	32	27	33	21	25	170
Totals		583	583	583	583	583	583	3,498
<b>TOTAL DMI POPULATION (Estimated)</b>								
Agriculture	I	101	97	100	81	48	53	480
Mining	I	8	15	0	8	0	10	41
Construction	II	564	269	434	217	376	269	2,128
Manufacturing	I	433	386	356	435	468	344	2,423
Distributive Services	I	511	479	603	531	596	536	3,256
Business Services	I	593	610	553	562	532	467	3,317
H, Ed, Soc Services	I	58	100	77	65	91	36	429
Retail	II	1,173	1,347	1,347	1,417	1,502	1,358	8,144
Consumer Services	II	487	454	404	477	315	336	2,474
Totals		3,928	3,758	3,874	3,794	3,928	3,410	22,692

Table B.2. INITIAL DMI SAMPLE AND ESTIMATES OF DMI POPULATION: ST. PAUL ONLY

DMI Sample List	SIC Codes	Year Start in DMI File					Total	
		1979	1980	1981	1982	1983		1984
<b>SUBSET I</b>								
Agriculture	01-09							
Mining	10-14							
Manufacturing	20-39							
Distributive Services	40-51							
Business Services	60-67,73,86,89							
H, Ed, Soc Services	80,82,83							
<b>Total</b>		125	123	125	125	125	124	747
<b>SUBSET II</b>								
Construction	15-17							
Retail	52-59							
Consumer Services	70,72,75,76,78,79,84							
<b>Total</b>		42	42	42	42	42	42	252
<b>DMI POPULATION AT TIME OF SAMPLING</b>								
Subset I		125	123	159	160	131	124	822
Subset II		116	113	132	132	142	144	779
		241	236	291	292	273	268	1,601
<b>SAMPLING INTERVALS (RATIOS)</b>								
Subset I		1.00	1.00	1.27	1.28	1.05	1.00	1.10
Subset II		2.76	2.69	3.14	3.14	3.38	3.43	3.09
<b>DMI SAMPLE BY INDUSTRY</b>								
Agriculture	I	3	3	3	6	0	2	17
Mining	I	0	0	0	0	1	0	1
Construction	II	8	7	5	10	14	14	58
Manufacturing	I	31	23	24	31	30	27	166
Distributive Services	I	24	40	38	33	32	36	203
Producer Services	I	61	43	47	52	52	51	306
H, Ed, Soc Services	I	6	14	13	3	10	8	54
Retail	II	23	30	29	23	20	21	146
Consumer Services	II	11	5	8	9	8	7	48
<b>Totals</b>		167	165	167	167	167	166	999
<b>TOTAL DMI POPULATION (Estimated)</b>								
Agriculture	I	3	3	4	8	0	2	19
Mining	I	0	0	0	0	1	0	1
Construction	II	22	19	16	31	47	48	183
Manufacturing	I	31	23	31	40	31	27	183
Distributive Services	I	24	40	48	42	34	36	224
Producer Services	I	61	43	60	67	54	51	336
H, Ed, Soc Services	I	6	14	17	4	10	8	59
Retail	II	64	81	91	72	68	72	447
Consumer Services	II	30	13	25	28	27	24	148
<b>Totals</b>		241	236	291	292	273	268	1,601

Table B.3. DEVELOPING ESTIMATES OF TOTAL NEW FIRM POPULATIONS

Industry Sector	Agri Serv	Mining	Const	Manufac	Dist Serv	Bus H,Ed,Soc Serv	Retail	Cons Serv	Total	
Sampling Subset	I	I	II	I	I	I	II	II		
1979										
MN, w/o St.Paul DMI	101	8	564	433	511	593	58	1,173	487	3,928
St.Paul DMI	3	0	22	31	24	61	6	64	30	241
Total DMI file	104	8	586	464	535	654	64	1,237	517	4,169
Birch correction	2.4	1.7	1.7	1.6	1.5	2.8	2.8	1.5	2.8	
Total population	250	14	996	742	803	1,831	179	1,856	1,448	8,118
1980										
MN, w/o St.Paul DMI	97	15	269	386	479	610	100	1,347	454	3,757
St.Paul DMI	3	0	19	23	40	43	14	81	13	236
Total DMI file	100	15	288	409	519	653	114	1,428	467	3,993
Birch correction	2.4	1.7	1.7	1.6	1.5	2.8	2.8	1.5	2.8	
Total population	240	26	490	654	779	1,828	319	2,142	1,308	7,785
1981										
MN, w/o St.Paul DMI	100	0	434	356	603	553	77	1,347	404	3,874
St.Paul DMI	4	0	16	31	48	60	17	91	25	292
Total DMI file	104	0	450	387	651	613	94	1,438	429	4,166
Birch correction	2.8	1.8	1.8	1.7	1.5	3.2	3.2	1.5	3.2	
Total population	292	0	810	658	977	1,962	301	2,157	1,373	8,529
1982										
MN, w/o St.Paul DMI	81	8	217	435	531	562	65	1,417	477	3,793
St.Paul DMI	8	0	31	40	42	67	4	72	28	292
Total DMI file	89	8	248	475	573	629	69	1,489	505	4,085
Birch correction	3.4	2.0	2.0	1.8	1.6	3.9	3.9	1.6	3.9	
Total population	303	16	496	855	917	2,453	269	2,382	1,970	9,661
1983										
MN, w/o St.Paul DMI	48	0	376	468	596	532	91	1,502	305	3,918
St.Paul DMI	0	1	47	31	34	54	10	68	27	272
Total DMI file	48	1	423	499	630	586	101	1,570	332	4,190
Birch correction	4.4	2.3	2.3	1.9	1.7	4.9	4.9	1.7	4.9	
Total population	211	2	973	948	1,071	2,871	495	2,669	1,627	10,868
1984										
MN, w/o St.Paul DMI	53	10	269	344	536	467	36	1,358	336	3,409
St.Paul DMI	2	0	48	27	36	51	8	72	24	268
Total DMI file	55	10	317	371	572	518	44	1,430	360	3,677
Birch correction	6.4	2.6	2.6	2.1	1.8	7.0	7.0	1.8	7.0	
Total population	352	26	824	779	1,030	3,626	308	2,574	2,520	12,039
Six Year Total										
Total DMI file	500	42	2,312	2,605	3,480	3,653	486	8,592	2,610	24,280
Population estimate	1,647	83	4,589	4,637	5,575	14,572	1,871	13,780	10,244	56,999
Six Year Total Corrected										
Correction	.5									
Total DMI file	250	21	1,156	1,303	1,740	1,827	243	4,296	1,305	12,140
Total population	824	42	2,294	2,318	2,787	7,286	936	6,890	5,122	28,499

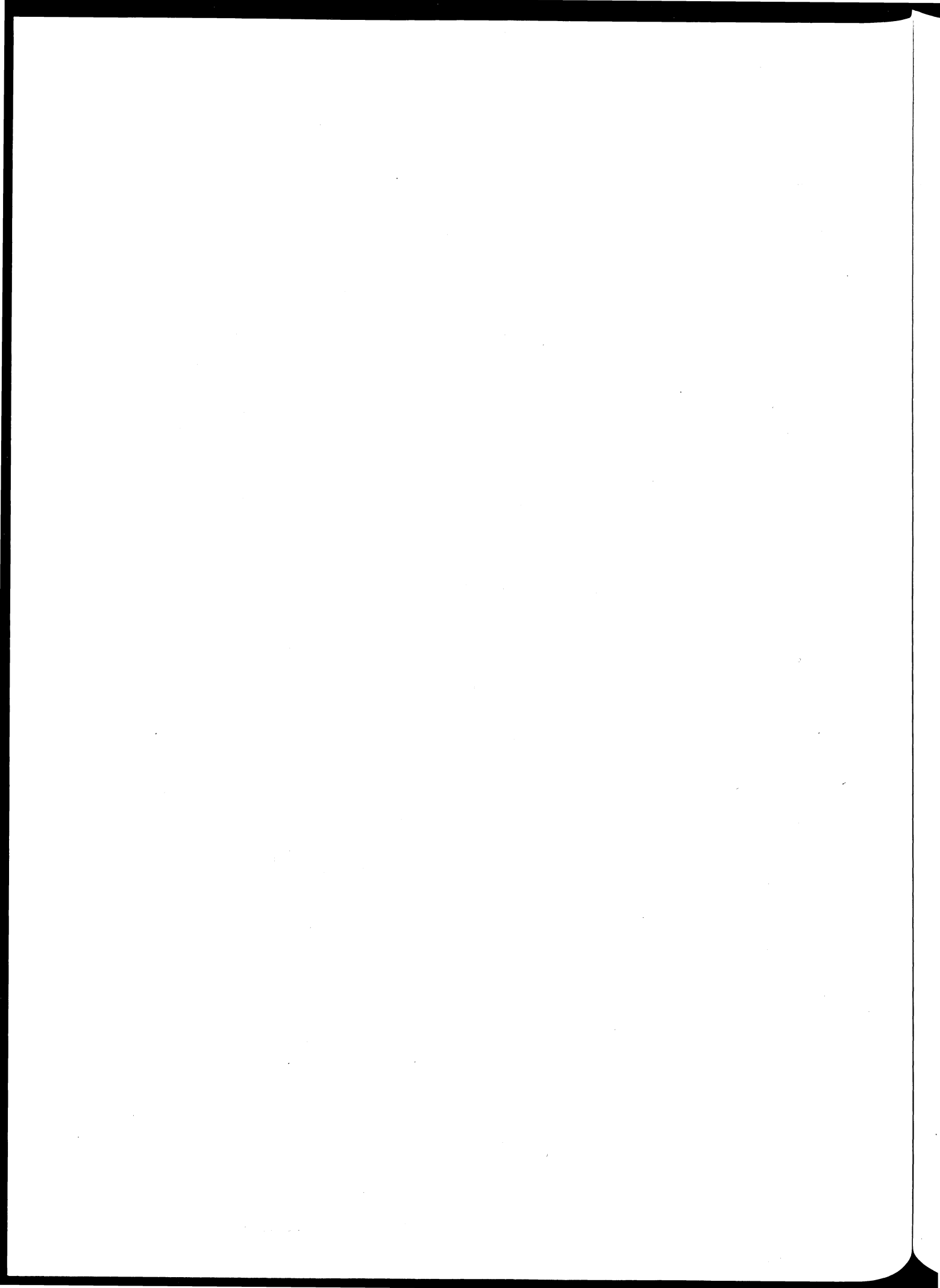
Table B.4. DEVELOPING ESTIMATES OF NEW FIRM POPULATION BY MINNESOTA REGION

Minn Region(a)	1	2	3	4	5	6W	6E	7W	7E	8	9	10	11 TC	Part	St. Paul	Total	
<b>DMI SAMPLE COUNT</b>																	
Agri Services	3	0	2	10	4	1	0	5	1	2	4	7			44	15	98
Mining	0	0	2	1	0	0	1	0	1	0	1	1			4	1	12
Construction	3	3	5	7	4	0	4	12	4	3	5	20			75	58	203
Manufacturing	11	7	38	27	24	5	17	42	12	13	31	41			370	166	804
Dist Services	22	7	46	39	25	10	19	57	9	21	44	72			490	203	1,064
Bus Services	3	6	39	7	14	3	20	28	8	6	21	53			666	306	1,180
H, Ed, Soc Serv	0	1	8	3	5	1	6	7	0	0	5	12			64	54	166
Retail	19	12	49	35	32	9	14	46	23	24	36	60			202	146	707
Consumer Serv	4	2	21	8	7	3	5	14	7	6	7	21			65	48	218
	65	38	210	137	115	32	86	211	65	75	154	287			1,980	997	4,452
<b>DMI SAMPLING RATIOS</b>																	
Agri Services	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79			3.79	1.10	
Mining	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79			3.79	1.10	
Construction	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55			14.55	3.09	
Manufacturing	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79			3.79	1.10	
Dist Services	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79			3.79	1.10	
Bus Services	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79			3.79	1.10	
H, Ed, Soc Serv	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79			3.79	1.10	
Retail	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55			14.55	3.09	
Consumer Serv	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55	14.55			14.55	3.09	
<b>TOTAL DMI FILE ESTIMATES</b>																	
Agri Services	11	0	8	38	15	4	0	19	4	8	15	27	183	167	17	331	
Mining	0	0	8	4	0	0	4	0	4	0	4	4	16	15	1	43	
Construction	44	44	73	102	58	0	58	175	58	44	73	291	1,270	1,091	179	2,289	
Manufacturing	42	27	144	102	91	19	64	159	45	49	117	155	1,585	1,402	183	2,601	
Dist Services	83	27	174	148	95	38	72	216	34	80	167	273	2,080	1,857	223	3,486	
Bus Services	11	23	148	27	53	11	76	106	30	23	80	201	2,861	2,524	337	3,649	
H, Ed, Soc Serv	0	4	30	11	19	4	23	27	0	0	19	45	302	243	59	484	
Retail	276	175	713	509	466	131	204	669	335	349	524	873	3,390	2,939	451	8,614	
Consumer Serv	58	29	306	116	102	44	73	204	102	87	102	306	1,094	946	148	2,622	
Totals	526	327	1,603	1,057	899	250	573	1,574	612	639	1,100	2,174	12,782	11,184	1,598	24,118	
<b>CORRECTION(b)</b>	.50																
Agri Services	6	0	4	19	8	2	0	9	2	4	8	13	92			166	
Mining	0	0	4	2	0	0	2	0	2	0	2	2	8			21	
Construction	22	22	36	51	29	0	29	87	29	22	36	146	635			1,144	
Manufacturing	21	13	72	51	45	9	32	80	23	25	59	78	792			1,300	
Dist Services	42	13	87	74	47	19	36	108	17	40	83	136	1,040			1,743	
Bus Services	6	11	74	13	27	6	38	53	15	11	40	100	1,430			1,825	
H, Ed, Soc Serv	0	2	15	6	9	2	11	13	0	0	9	23	151			242	
Retail	138	87	356	255	233	65	102	335	167	175	262	437	1,695			4,307	
Consumer Serv	29	15	153	58	51	22	36	102	51	44	51	153	547			1,311	
<b>LOW ESTIMATE</b>	263	163	801	529	449	125	287	787	306	320	550	1,087	6,391			12,059	
<b>BIRCH CORRECTION(c)</b>																	
Agri Services	3.10	18	0	12	59	23	6	0	29	6	12	23	41	284		513	
Mining	1.90	0	0	7	4	0	0	4	0	4	0	4	4	15		41	
Construction	1.90	41	41	69	97	55	0	55	166	55	41	69	276	1,207		2,175	
Manufacturing	1.75	36	23	126	90	80	17	56	139	40	43	103	136	1,387		2,276	
Dist Services	1.55	65	21	135	115	73	29	56	167	26	62	129	211	1,612		2,702	
Bus Services	3.55	20	40	262	47	94	20	135	188	54	40	141	357	5,078		6,477	
H, Ed, Soc Serv	3.55	0	7	54	20	34	7	40	47	0	0	34	81	536		859	
Retail	1.55	214	135	553	395	361	101	158	519	259	271	406	677	2,627		6,676	
Consumer Serv	3.55	103	52	542	207	181	77	129	362	181	155	181	542	1,942		4,654	
<b>HIGH ESTIMATE</b>	498	319	1,760	1,032	901	258	633	1,618	625	624	1,090	2,325	14,689			26,371	

(a) See Figure 1.6 for Minnesota region names.

(b) Reduced to compensate for DMI inaccuracies.

(c) Average of third and fourth year corrections of Birch and MacCracken.





## Appendix C

### RESEARCH PROCEDURE

This project is a survey of new Minnesota businesses. As with any survey, it has several important stages:

1. Definition of the total population, the universe of new firms.
2. Selection of a sample to represent the population.
3. Determination of information to be gathered on each firm.
4. Collection of information from the sample.
5. Analysis of the information in relation to the most critical issues or hypotheses.

Although the outline is simple, the execution is somewhat complex, as there are major problems with each aspect of the procedure.

#### DEFINING THE POPULATION OF NEW FIRMS

Defining when a new firm exists is the first major conceptual problem. When is the attempt to initiate an economic enterprise considered to be "more than dreams and talk"? When incorporation occurs? When business cards are printed? When loans are sought? When income is first received? When the first employee is hired? Each criterion has its own set of problems in defining a population of new firms.

Each major source of lists of new firms reflects a different perspective. Legal incorporation is recorded on a regular basis, regardless of whether any economic activities ensue. Yellow page listings are also used in some analyses. Dun and Bradstreet credit ratings, reflecting loan applications, become the Dun's Market Identifier (DMI) file promoted as an "investment" for marketing strategies. Federal and state tax records can be used to identify "business income," often by full-time employees working as consultants or single individuals with several "businesses." The filing of unemployment insurance payments is used to count establishments and employees, but this excludes firms with no employees.

All of these approaches "overlook" businesses providing illegal services (drugs, gambling, sexual services, etc.) and those in the underground economy (legitimate activities performed for cash to avoid taxes, regulations, and legal liability). Further, some of the most complete lists are treated as confidential tax records, for example, those based on unemployment insurance payments or income tax records. The specific identities of these firms are not available for research projects--regardless of the procedures, sponsors, or purpose.

Our final choice was to use a relatively complete, though biased, commercial listing and correct, as necessary, for known biases. Specifically, we used the Dun's Market Identifier file, a summary of establishment information provided for marketing purposes by Dun's Marketing Services. Most firms become part of the DMI file when they apply for credit and the lender (bank, supplier, etc.) insists on a Dun and Bradstreet credit report.

One major bias, unfortunately, is in the inclusion of new firms. The DMI file probably includes virtually all established firms, those over ten years old. Firms that require large amounts of credit, in manufacturing and wholesale, are more likely to be included in the DMI file early in their history. Further, as the file is sold on a "per listing" basis (about sixty-five cents each), there is a vested interest in maintaining a large list of firms; the deletion of inactive firms may be slow and unsystematic.<sup>1</sup>

The DMI file information on each firm includes a "year start date"; initially defined as the date of birth, it is now described as including "changes in control"--changes in firm ownership. This information is the key criterion in locating new Minnesota firms.

The DMI lists about 4,000 Minnesota establishments with a start date for each of the recent years (1979-84). As the Dun and Bradstreet procedures tend to identify firms after several years, the number of firms in the preceding twelve months is usually quite low. For this analysis, new firms were defined as those with a Dun and Bradstreet "year start" date over a six-year period, 1979 through 1984.

To restrict the focus to only those firms that were initiated by private citizens, establishments listed as subsidiaries or branches of existing firms were excluded.

Three relevant descriptions are presented in Figure C.1. One is the distributions of Minnesota establishments for 1985 from *County Business Patterns* (CBP), a complete census. The second is the distribution of establishments with year start dates of 1979-84 estimated for the DMI file (taken from Appendix B, Table B.3). The third is the distribution of new firms represented by the sample that is the basis for the analysis in this report. This last has been adjusted to reflect the different sampling ratios related to the DMI file.

The three descriptions are very similar. There are only two industry sectors with "order of magnitude" differences: manufacturing and health, education, and social services. The new firm sample has about twice the proportion of manufacturing firms as in the population CBP estimate, and about one-third the proportion of health, education, and social services new firms as in the population estimate. This may reflect differential capture rates of new firms by Dun's DMI staff; they may be more likely to include new manufacturing firms that require substantial start-up capital and less likely to include new medical care professionals (the dominant proportion of the

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<sup>1</sup> Dun's Marketing Services representatives strongly deny this.

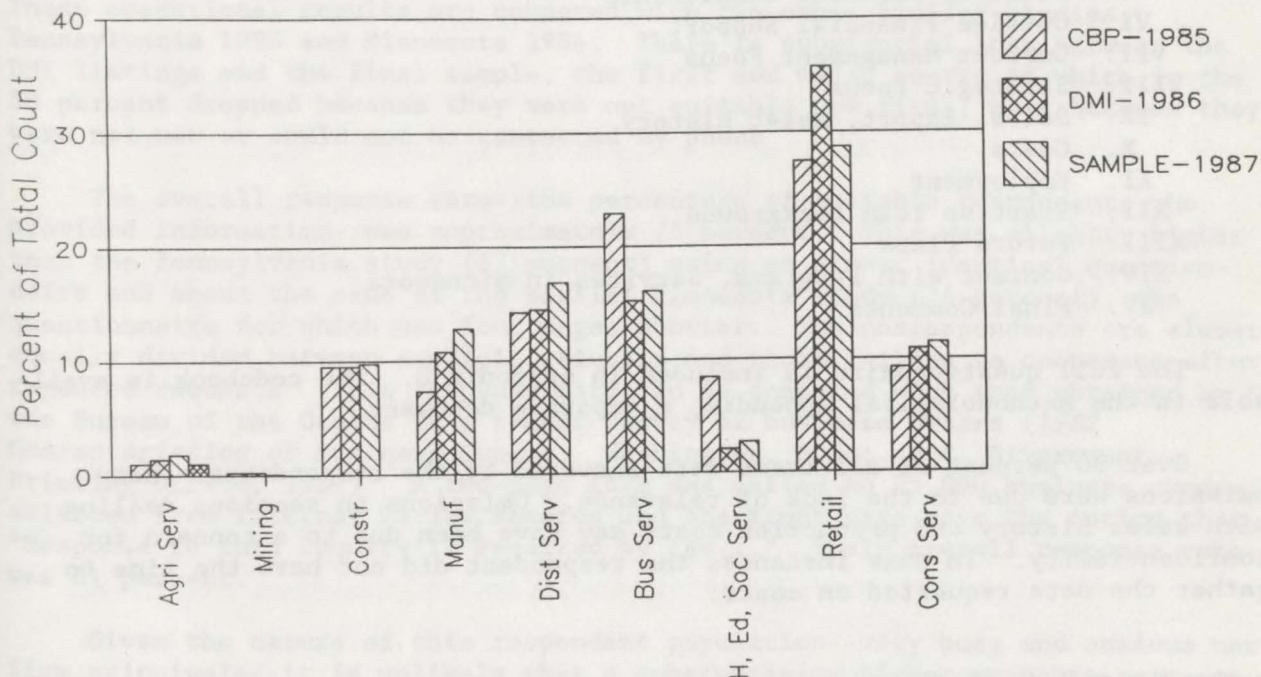
entities in the health, education, and social service sector) who may not require major funding to start a business.

These differences may also reflect the slightly lower proportion in business services. The increased DMI proportion in retail may reflect a higher founding rate; the lower sample proportion may reflect a reduced response rate for smaller retail outlets.

It is also possible that these differences may reflect real differences in new firm births, survival, and cooperation related to different industry sectors. For example, there may be a lower founding rate of new entities in health, education, and social services and a higher rate in retail. It is impossible to determine which of these is the most significant in accounting for these differences.

Fortunately, the differences are relatively small. It is appropriate to have confidence that the new firm sample, with appropriate weights, represents new firms that have emerged in Minnesota between 1979 and 1984.

Figure C.1. COUNTY BUSINESS PATTERNS (CBP) ESTABLISHMENT CENSUS, DUN'S MARKETING IDENTIFIER (DMI) FILE COUNT, AND NEW FIRM SAMPLE COMPARED, BY INDUSTRY SECTOR



#### SAMPLE: SELECTING RESPONDENTS FROM THE POPULATION

Potential respondents were identified in two steps. The first step was to select firms from the DMI file. This is described in detail in Appendix B. The second was to screen these firms in a brief phone interview and exclude those that were inappropriate.

Prior to the phone screening, the DMI listing was randomly divided into waves, each checked to ensure that all regions and industry sectors were represented. Each wave was then processed through the entire procedure. This technique allowed a complete coverage of the major factors in the event that financial resources prevented implementation of the original research design. This was the case in this project, for only 3,900 of the original 4,497 DMI listings could be processed.

#### QUESTIONNAIRE: INFORMATION OBTAINED ON EACH NEW FIRM

The questionnaire consisted of fifteen major sections:

- I. Products/Services
- II. Choice of Location
- III. Start-up Problems
- IV. Legal Form
- V. Start-up Resource Commitments
- VI. Outside Financial Support
- VII. Current Management Focus
- VIII. Strategic Focus
- IX. Sales, Export, Asset History
- X. Costs
- XI. Employment
- XII. Start-up Team Background
- XIII. Future Plans
- XIV. Contact with Programs, Services in Minnesota
- XV. Final Comments

The full questionnaire is included in Appendix D. The codebook is available in the Methodological Appendix, a separate document.

Over 90 percent of all items were answered by the respondents. Many omissions were due to the lack of relevance. Omissions in sections dealing with sales history and production costs may have been due to a concern for confidentiality. In some instances the respondent did not have the time to gather the data requested on costs.

#### GATHERING DATA: PROCEDURE FOR DATA COLLECTION

The procedure for data collection had three major stages and a fourth, minor, one. The major stages were as follows:

1. All DMI listings were screened to identify those firms that were autonomous, new starts, in a business, and still viable. This phone contact

was used to identify a suitable respondent--the person who had helped start the business and was still active in the management--as well as his or her correct mailing address.

2. Questionnaires were mailed to the respondent: an initial mailing; a follow-up postcard; a second mailing; and, if necessary, a third mailing by certified mail.
3. After the three mailings, phone interviews were attempted with firms that had not responded. One-third of the material was deleted for these interviews (sections III, V, VII, and parts of XII). Attempts were made to complete phone interviews until the overall response rate was considered acceptable; some firms were contacted more than ten times by phone.
4. After questionnaires were received in the mail or interviews completed over the phone, those editing and coding the questionnaires in preparation for data entry made additional calls to the respondents to obtain critical "missing data," defined as related to sales, exports, or employment.

#### RESULTS: SAMPLE SELECTION AND RESPONSE RATES

The results of the data collection procedures are summarized in Table C.1. These operational results are compared with two other similar studies, Pennsylvania 1986 and Minnesota 1984. There is substantial loss between the DMI listings and the final sample, the first and major source of which is the 50 percent dropped because they were not suitable new firms, most because they were not new or could not be contacted by phone.

The overall response rate--the percentage of suitable respondents who provided information--was approximately 75 percent. This was slightly higher than the Pennsylvania study (67 percent) using an almost identical questionnaire and about the same as the earlier Minnesota study (76 percent), the questionnaire for which was four pages shorter. The nonrespondents are almost equally divided between explicit refusals and those failing to cooperate after repeated requests. This response rate can be compared with that obtained by the Bureau of the Census in a recent survey of business owners (1982 *Characteristics of Business Owners*. Washington, D.C.: U.S. Government Printing Office, 1987). A two-page form was mailed to 25,000 business owners selected from Internal Review Records and the front page bore the notice that "Response to this inquiry is required by law..." Their overall response rate was 81 percent.

Given the nature of this respondent population--very busy and anxious new firm principals--it is unlikely that a substantially higher response rate can be achieved unless there is a legal obligation to provide information or interviewers make personal visits to each respondent, which would be considerably more expensive.

Only because the interviewing staff was conscientious, gracious, and tenacious was such a high level of response achieved.

Table C.1. SUMMARY OF RESULTS OF DATA COLLECTION PROCEDURE

	Minnesota (Summer/ Fall 1986)	Pennsylvania (Winter/ Spring 1986)	Pilot Study (Summer 1984)
Random sample of firms from files of Dun's Marketing Services	3,000	4,600	1,245
Dropped if unable to verify in phone interview as new, autonomous, viable, or a firm	1,516 (51%)	2,289 (50%)	521 (42%)
Received three mailings of self-completion questionnaire and return envelope	1,484	2,311	724
Returned self-completed questionnaire	665 (45%)	825 (36%)	398 (55%)
Failed to return questionnaire; approached for phone interview	819	1,486	326
Completed phone interview	454 (55%)	724 (49%)	153 (47%)
<u>Summary of Results</u>			
Total completed interviews	1,119 (75%)	1,549 (67%)	551 (76%)
Total not completed	365 (25%)	762 (33%)	173 (24%)
Total initial sample	1,484 (100%)	2,311 (100%)	724 (100%)

#### FINAL COMMENTS

It is possible to have high confidence that the sample represents new firms initiated by individuals (alone or as a group) in Minnesota between 1979 and 1984. This confidence is justified by the close match of the sample with a recent census of Minnesota establishments, the careful screening used to exclude ineligible firms (out of business, not new, or not a business), and the relatively high response rate.

Other research may provide different descriptions of the Minnesota economy, but it is unlikely that more representative data could be obtained on a voluntary basis from those initiating new firms.



Appendix D  
Questionnaire

1986  
Minnesota New Firm Study



University of Minnesota

This should be completed by a person that:

- Is active in the management of the firm AND
- Had a major responsibility for starting the firm.

This questionnaire is designed for a wide variety of firms.  
Please answer as many items as you can, skip the others.

**CONFIDENTIALITY AND ANONYMITY**

- All information specific to individual firms will be kept confidential.
- The identify of all firms involved in the survey will remain anonymous.

Entry No: \_\_\_\_\_

ID No: \_\_\_\_\_

\_\_\_\_\_

## I — Products/Services

A. What is the major product or service provided by your firm?

\_\_\_\_\_

B. What is special about your products or services that provides an advantage over your competitors?

\_\_\_\_\_

C. In terms of current business, what is the mix of sales among principal products, product lines, or services?

	PRODUCT OR PRODUCT LINE	Percentage of Firm Income
1)	_____	_____ %
2)	_____	_____ %
	All other products	_____ %
	<b>SERVICE(S)</b>	
4)	_____	_____ %
5)	_____	_____ %
6)	All other service(s)	_____ %
	TOTAL should equal	100 %

## II — Choice of Location

A. What were the most important reasons for starting this firm in this city? county?

B. What were the most important reasons for choosing this specific site(s) for the firm?

C. A number of factors are required to produce goods and services. Please evaluate each of the following, as they currently exist, in relation to satisfaction with and importance to your firm.

CIRCLE TWO NUMBERS FOR EACH FACTOR.	SATISFIED			IMPORTANT		
	Very	Somewhat	Not	Very	Somewhat	Not
	:	:	:	:	:	:
	:	:	:	:	:	:
	:	:	:	:	:	:
1) Labor costs	3	2	1	2	1	0
2) Availability of highly skilled workers	3	2	1	2	1	0
3) Education and training opportunities	3	2	1	2	1	0
4) Access to research and development facilities	3	2	1	2	1	0
5) Quality of life	3	2	1	2	1	0
6) Access to customers	3	2	1	2	1	0
7) Access to suppliers	3	2	1	2	1	0
8) Capital availability	3	2	1	2	1	0
9) Infrastructure (roads, water, sewers)	3	2	1	2	1	0
10) Transportation (highways, railroads)	3	2	1	2	1	0
11) Energy costs	3	2	1	2	1	0
12) Energy reliability	3	2	1	2	1	0
13) Taxes	3	2	1	2	1	0
14) Zoning and land use	3	2	1	2	1	0
15) Land availability (for expansion, etc)	3	2	1	2	1	0
16) Land purchase / rental cost	3	2	1	2	1	0
17) Building space availability	3	2	1	2	1	0
18) Building space expenditures (rent, etc)	3	2	1	2	1	0
19) Local regulations	3	2	1	2	1	0
20) Local government support for business	3	2	1	2	1	0
21) Other: _____	3	2	1	2	1	0



(Please circle the correct responses.)

**INITIAL SEVERITY**

(Status as the firm was, or is, being established.)

Did Not Apply

: Never  
: Occurred  
: : Minor  
: : Problem  
: : Major  
: : Prob

**CURRENT STATUS**

(Current situation with regards to this problem.)

Fully Solved

: Partially  
: Solved  
: Not  
: Sol-  
: ved  
: :  
: :

**C. MANAGEMENT/ORGANIZATIONAL**

1) Coping with government regulations	0	1	2	3	FS	PS	NS
2) Developing good relationship with union(s)	0	1	2	3	FS	PS	NS
3) Selecting a lawyer or accountant	0	1	2	3	FS	PS	NS
4) Motivating/compensating personnel	0	1	2	3	FS	PS	NS
5) Coordinating tasks among personnel/units	0	1	2	3	FS	PS	NS
6) Preparing a business plan	0	1	2	3	FS	PS	NS
7) Using/updating a business plan	0	1	2	3	FS	PS	NS
8) Setting goals/priorities for personnel	0	1	2	3	FS	PS	NS
9) Measuring performance against plans	0	1	2	3	FS	PS	NS
10) Clarifying goals/objectives	0	1	2	3	FS	PS	NS
11) Implementing plans, strategy	0	1	2	3	FS	PS	NS
12) Finding qualified managers, executives	0	1	2	3	FS	PS	NS
13) Finding qualified technical or professional staff	0	1	2	3	FS	PS	NS
14) Finding qualified employees	0	1	2	3	FS	PS	NS
15) Minimizing startup team conflict	0	1	2	3	FS	PS	NS

**D. SELECTING/DEVELOPING A LOCATION**

1) Identifying/selecting suitable site	0	1	2	3	FS	PS	NS
2) Locating suitable rental space	0	1	2	3	FS	PS	NS
3) Appropriate transportation structure (e.g., rail, highway, public transportation)	0	1	2	3	FS	PS	NS
4) Appropriate infrastructure (e.g. sewer, energy sources, water, roads, etc.)	0	1	2	3	FS	PS	NS
5) Access to customers, clients	0	1	2	3	FS	PS	NS
6) Access to suppliers, vendors	0	1	2	3	FS	PS	NS
7) Access to employees	0	1	2	3	FS	PS	NS

## IV — Legal Form

A. What was the initial and is the current legal form of this new firm?

	INITIALLY (circle one)	NOW (Sum 86) (circle one)
Sole proprietorship	01	01
Partnership	02	02
Limited partnership	03	03
Subchapter S Corporation	04	04
Corporation	05	05
Franchise	06	06
Other	07	07
Don't know	08	08
Confidential	09	09

## V — Startup Resource Commitments

A. When did members of the startup team first begin to make major investments — personal time, personal resources — in the new firm?      Month \_\_\_\_\_ Year \_\_\_\_\_

B. BEFORE formal outside financing (any bank loans, stock placements, venture capital support, etc.) was obtained, how much financial support came from each of the following sources:

	(Round to nearest \$1,000)
1) Personal savings	\$ _____,000
2) Spouse or other members of immediate family	\$ _____,000
3) Relatives and other kin (parents, siblings)	\$ _____,000
4) Friends or Business Associates (Informally)	\$ _____,000
5) Salaries foregone by startup team members	\$ _____,000
6) Salaries foregone by employees	\$ _____,000
7) Credit from suppliers	\$ _____,000
8) Other (please list):	
	\$ _____,000
<b>TOTAL</b>	<b>\$ _____,000</b>



## VI — Outside Financial Support

A. When was the first outside financial support obtained?    None: \_\_\_\_\_    Month: \_\_\_\_\_    Year: \_\_\_\_\_

B. Please estimate the total financial support from each source twice:  
a) when the first outside support was received and b) now.

(Amounts in \$1,000s)

**VERY FIRST      NOW**  
**OUTSIDE SUPPORT (Sum 86)**

- |   |              |              |
|---|--------------|--------------|
| 1) OUTSIDE Loans of any type: (From banks, savings and loans, other regulated financial institutions) |              |              |
| Working Capital or line of credit   | \$ _____,000 | \$ _____,000 |
| Term loans: Machinery & Equipment   | \$ _____,000 | \$ _____,000 |
| Term loans: Inventory   | \$ _____,000 | \$ _____,000 |
| Term loans: Real estate loans   | \$ _____,000 | \$ _____,000 |
| Other: _____  | \$ _____,000 | \$ _____,000 |
| 2) EXTERNAL Equity Investments:   |              |              |
| Private Stock Placement   | \$ _____,000 | \$ _____,000 |
| Public Stock Offering   | \$ _____,000 | \$ _____,000 |
| Venture Capital Firm(s)   | \$ _____,000 | \$ _____,000 |
| Other Equity Sources (specify): _____   | \$ _____,000 | \$ _____,000 |
| 3) Loans provided by state or local governments?  |              |              |
| (Specify) _____   | \$ _____,000 | \$ _____,000 |
| 4) Employment, tax or other subsidies provided by the state or local governments                      |              |              |
| (Specify) _____   | \$ _____,000 | \$ _____,000 |
| 5) Federal government assistance?   |              |              |
| SBA Loan or Loan Guarantee  | \$ _____,000 | \$ _____,000 |
| Other (specify): _____  | \$ _____,000 | \$ _____,000 |
| 6) Percentage of control/ownership retained by original founders of the firm?                         |              |              |
|   | _____ %      | _____ %      |
| C. What have been the major problems in obtaining financial support?                                  |              |              |

## VII — Current Management Focus

Circle One Number for Each Item

A. AT THE PRESENT TIME, TO WHAT DEGREE DO COMPANY MANAGEMENT, YOU AND OTHER TOP EXECUTIVES...	VERY MUCH	QUITE A BIT	A MODERATE AMOUNT	LITTLE	NONE	CAN NOT EVALUATE
1) Clearly know your industry and market?	1	2	3	4	5	0
2) Have technical experience in key areas?	1	2	3	4	5	0
3) Have sufficiently well-rounded business experience?	1	2	3	4	5	0
4) Have willingness to take necessary risks?	1	2	3	4	5	0
5) Display high levels of energy and motivation?	1	2	3	4	5	0
6) Have close customer contacts?	1	2	3	4	5	0
7) Have formal written business and marketing plans?	1	2	3	4	5	0
8) Regularly use, modify, and update plans?	1	2	3	4	5	0
9) Set goals, priorities, and follow up to ensure they are attained?	1	2	3	4	5	0
10) Accurately forecast operational results?	1	2	3	4	5	0
11) Communicate goals and priorities to all company personnel?	1	2	3	4	5	0
12) Work together as a cohesive team?	1	2	3	4	5	0
B. IN TERMS OF FINANCE AND BUDGETS, HOW MUCH DOES YOUR COMPANY...	1	2	3	4	5	0
1) Have a sound financial control system?	1	2	3	4	5	0
2) Generate adequate cash flows from sales?	1	2	3	4	5	0
3) Accurately forecast cash flow requirements?	1	2	3	4	5	0
4) Have a sound cash flow position?	1	2	3	4	5	0
5) Have strong support from the financial community of investors?	1	2	3	4	5	0
6) Face the next few years with high certainty about its ability to survive?	1	2	3	4	5	0

Circle One Number for Each Item

VERY MUCH  
 : QUITE A BIT  
 : A MODERATE AMOUNT  
 : LITTLE  
 : NONE  
 : CAN NOT  
 : EVALUATE

**C. IN TERMS OF PRODUCTS AND MARKETING,  
 HOW MUCH DOES YOUR COMPANY...**

1) Have a clear market niche for its products and services?	1	2	3	4	5	0
2) Provide quality products and services?	1	2	3	4	5	0
3) Demonstrate ability to reach markets through its marketing/advertising activities?	1	2	3	4	5	0
4) Aggressively sell its products and services?	1	2	3	4	5	0
5) Have products or services that have a clear competitive advantage?	1	2	3	4	5	0
6) Produce its products/services on time and within budget?	1	2	3	4	5	0
7) Have an active program of new product development?	1	2	3	4	5	0

**VIII — Strategic Focus**

Please indicate the most important aspects of your competitive strategy.

(Circle the best response for each.)

CRITICAL  
 : IMPORTANT  
 : MARGINAL  
 : INSIGNIFICANT

1. Lower prices	1	2	3	4
2. Better service	1	2	3	4
3. Quality products/services	1	2	3	4
4. More choices	1	2	3	4
5. Customize product/service to clients	1	2	3	4
6. More effective marketing/advertising	1	2	3	4
7. Fast response to changes in markets	1	2	3	4
8. Serve those missed by others	1	2	3	4
9. Superior location/customer convenience	1	2	3	4
10. Distinctive goods/services	1	2	3	4
11. Better, more attractive facilities	1	2	3	4
12. More contemporary, attractive products	1	2	3	4
13. Utilize new/advanced technology	1	2	3	4
14. Develop new/advanced technology	1	2	3	4

## IX — Sales, Export, Asset History

- A. When did the firm receive its first sales income/revenue? Mth \_\_\_\_\_ Yr \_\_\_\_\_
- B. Please provide a history of sales/revenue and assets — estimates are acceptable.

	TOTAL REVENUE (Gross Income)  (in \$1,000s)	PERCENTAGE SOLD				YEAR-END TOTAL NET ASSET VALUE (in \$1,000s)
		Within Minn- esota	Adjacent States (IA,ND,SD,WI)	To Rest of U.S.	Outside the U.S.	
1985	\$ _____,000	_____%	_____%	_____%	_____%	\$ _____,000
1984	\$ _____,000	_____%	_____%	_____%	_____%	\$ _____,000
1983	\$ _____,000	_____%	_____%	_____%	_____%	\$ _____,000
1982	\$ _____,000	_____%	_____%	_____%	_____%	\$ _____,000
1981	\$ _____,000	_____%	_____%	_____%	_____%	\$ _____,000
1980	\$ _____,000	_____%	_____%	_____%	_____%	\$ _____,000
1979	\$ _____,000	_____%	_____%	_____%	_____%	\$ _____,000
Pre- 1979 (Average)	_____ ,000	_____%	_____%	_____%	_____%	\$ _____,000

## X — Costs

Please estimate the amount spent for each expense in 1985. (in \$1,000)

**(ALLOCATE EACH EXPENSE TO ONLY ONE CATEGORY.)**

• PURCHASES OF GOODS OR SERVICES:	
ALL MATERIAL COSTS: Raw Material, Parts, Subassemblies, Sub-Contracts, Supplies, Bulk Purchases, . . .	\$ _____,000
PHYSICAL ASSETS COSTS: Payments for lease or purchase of physical assets: Building, Machines, Equipment . . .	\$ _____,000
ANY BUSINESS OR PROFESSIONAL SERVICES: Marketing, Legal, Accounting, Consulting . . .	\$ _____,000
• DEPRECIATION OF CAPITAL INVESTMENTS:	\$ _____,000
• SALARIES AND WAGES (RELATED TO)	
TRAINING EXPENSES	\$ _____,000
RESEARCH AND DEVELOPMENT	\$ _____,000
ALL OTHER COMPENSATION: Salaries, Wages, Bonuses, Fringe Benefits	\$ _____,000
• COST OF SALES: Commissions, Distribution, Advertising, Promotions	\$ _____,000
• INTEREST	\$ _____,000
• TAXES	\$ _____,000

## XI — Employment

A. When did the firm first hire anybody  
 — full or part time?      None yet: \_\_\_\_\_ Month: \_\_\_\_\_ Year: \_\_\_\_\_

B. Has locating and hiring individuals with critical skills  
 or training been a major problem for the firm?      NO: \_\_\_\_\_ YES: \_\_\_\_\_

If yes, what types of skills or training or education, critical to the firm, are the most difficult to find?

1. \_\_\_\_\_ : : : : :

2. \_\_\_\_\_ : : : : :

3. \_\_\_\_\_ : : : : :

C. What kinds of on-the-job or formal training has THIS FIRM been providing new employees?

1. \_\_\_\_\_ : : : : :

2. \_\_\_\_\_ : : : : :

3. \_\_\_\_\_ : : : : :

D. For each of the following types of educational institutions, please indicate the most important type of RETRAINING or ADDITIONAL EDUCATION it can provide for your firm's managers, staff, or employees.

• Research Universities  
 (e.g. U of Minn): \_\_\_\_\_ : : : : :

• Four Year Colleges  
 (e.g. State U's, private): \_\_\_\_\_ : : : : :

• Two Year Colleges  
 (e.g. Community Colleges): \_\_\_\_\_ : : : : :

• Vocational/Technical Schools  
 (e.g. AVTIs, private): \_\_\_\_\_ : : : : :

• Other Sources of Training/  
 Education: (Please list)

1. \_\_\_\_\_ : : : : :

2. \_\_\_\_\_ : : : : :

E. List training needed, but not available.

1. \_\_\_\_\_ : : : : :

2. \_\_\_\_\_ : : : : :

E. For each job category, please indicate:

- The total involved during the first year of operation.
- The total number involved during Summer 1986.
- The major source of training, education for the typical employee.

Include all those receiving any cash or in-kind benefits from the company, INCLUDING YOURSELF, OTHER PRINCIPLES, and part time or temporary workers.

Please include each employee in only one category.

	NUMBER EMPLOYED		SOURCE OF TRAINING, EXPERIENCE		
	1st Yr	NOW Sum 86	External to Your Firm	Internal to Your Firm	External and Internal
1.	_____	_____	Executives, administrators, and managers sharing profit & loss responsibilities	E	E/I I
2.	_____	_____	Managers, supervisors without Profit and Loss responsibilities	E	E/I I
3.	_____	_____	Operating Staff professionals (engineers, accountants, lawyers, programmers, etc.)	E	E/I I
4.	_____	_____	Research and Development Professionals (Scientists, development engineers, lab technicians, analysts, etc.)	E	E/I I
5.	_____	_____	Sales/Marketing Representatives	E	E/I I
SKILLED CATEGORIES SHOULD INCLUDE ONLY THOSE WITH A FORMAL APPRENTICESHIP, TRAINING, OR CERTIFICATION.					
6.	_____	_____	Skilled Office Workers (Word processing operators, account clerks, paralegals, . . .)	E	E/I I
7.	_____	_____	Skilled Service Workers (Hairdresser, chef)	E	E/I I
8.	_____	_____	Skilled Craftsperson (Lathe operators, welders, etc.)	E	E/I I
9.	_____	_____	Operatives (Truck drivers, fry cook, etc.)	E	E/I I
UNSKILLED					
10.	_____	_____	Sales Clerks	E	E/I I
11.	_____	_____	Unskilled Office Workers (File clerk, etc.)	E	E/I I
12.	_____	_____	Unskilled Service Workers (Waiter/waitress, cleaner, bellhop, etc.)	E	E/I I
13.	_____	_____	Unskilled blue collar (Laborer, freight handler, baggers, etc.)	E	E/I I
14.	_____	_____	Other: _____	E	E/I I
	_____	_____	<b>TOTAL EMPLOYEES</b>		

## XII. Startup Team Background

A. When the first major effort was made to get this firm started, how many people made major commitments and expected to become part of the new firm's management team? \_\_\_\_\_

Please select up to three others, in addition to yourself, for the following questions. If more than three others helped start the firm, select those most involved. Identify them by their initials.

(Use code numbers when appropriate.)                      1) You    2) \_\_\_\_\_ 3) \_\_\_\_\_ 4) \_\_\_\_\_

B. Gender: Male            [01] \_\_\_\_\_  
                   Female        [02] \_\_\_\_\_

C. Indicate any minority group with which this person might identify:

Blacks	[01]			
Hispanic	[02]			
American Indian	[03]			
Southeast Asian	[04]			
Other Asian	[05]			
Other minority	[06]			
None	[07]			

D. Age when major commitment first made to new firm: \_\_\_\_\_

E. Education completed when major commitment first made to new firm:

Some Hi Sch [01]	College:BA,BS [06]		
High School [02]	Some Grad [07]		
Tech, Vocat'l [03]	Masters Deg [08]		
Some College [04]	LLB, PhD, MD [09]		
Assoc. Deg. [05]	Don't know [88]		

F. Years of work between finishing school and starting this firm: \_\_\_\_\_

G. Number of positions held before starting this firm: \_\_\_\_\_

H. Number of years of work in industries similar to that of new firm: \_\_\_\_\_

I. How many other new firms has this person helped start: \_\_\_\_\_

J. How many hours per week does each devote to the firm? \_\_\_\_\_



K. How would you describe the career shift of each person to the new firm? 1) You 2) \_\_\_\_\_ 3) \_\_\_\_\_ 4) \_\_\_\_\_

School to New firm [01]  
 Established organization to New Firm [02]  
 One New Firm to another New Firm [03]  
 Unemployment to New Firm [04]  
 Retirement to New Firm [05]  
 Other [06] \_\_\_\_\_

L. Using the code letters from the list below, indicate the major reasons each member of the team got involved:

Most important reason \_\_\_\_\_  
 Second most important \_\_\_\_\_  
 Third most important \_\_\_\_\_  
 Fourth most important \_\_\_\_\_

- |                               |                               |
|-------------------------------|-------------------------------|
| [A] The Challenge             | [G] Meet other's expectations |
| [B] To pursue an idea         | [H] Utilize skills, abilities |
| [C] Respect, Recognition      | [I] No better alternatives    |
| [D] Build estate for family   | [J] To live in the area       |
| [E] Income, wealth            | [K] Build an organization     |
| [F] Self employment, autonomy | [L] Contribute to society     |

[M] Other (1): \_\_\_\_\_  
 [N] Other (2): \_\_\_\_\_

### XIII — Future Plans

M. What are your business plans for the next 2-3 years? (CHECK ALL THAT APPLY)

\_\_\_ 1) Get out of the business.  
 \_\_\_ 2) Change mix of products or services.  
 \_\_\_ 3) Significant INCREASE in employees.  
 \_\_\_ 4) Significant DECREASE in employees.  
 \_\_\_ 5) Expansion of the firm. TO - City: \_\_\_\_\_ State: \_\_\_\_\_  
 \_\_\_ 6) Relocation of the firm. TO - City: \_\_\_\_\_ State: \_\_\_\_\_  
 \_\_\_ 7) Sell the firm.  
 \_\_\_ 8) No major changes.

## XIV — Contact with Programs, Services in Minnesota

Please evaluate the interest in, or value of, the following existing and proposed services for your firm or business.

(Please circle your response.)

	INTEREST IN/VALUE OF THE SERVICE			
	High	Moderate	Low	None
1. Federal procurement assistance	3	2	1	0
2. Developing foreign export markets	3	2	1	0
3. Tourism market development	3	2	1	0
4. Energy development opportunities	3	2	1	0
5. New site locations within a county	3	2	1	0
6. New site locations within Minnesota	3	2	1	0
7. Small business incubator sites	3	2	1	0
8. Retraining of existing employees	3	2	1	0
9. Training new employees	3	2	1	0
10. Land acquisition financing	3	2	1	0
11. Building construction financing	3	2	1	0
12. Infrastructure (e.g. water, sewer, road) financing	3	2	1	0
13. Employee ownership financing	3	2	1	0
14. Machinery, equipment financing	3	2	1	0
15. Working capital financing	3	2	1	0
16. Venture, seed capital financing	3	2	1	0
17. Joint R&D project development	3	2	1	0
18. Applying company R&D in new markets	3	2	1	0
19. New technology for productivity gain	3	2	1	0
20. Energy audits/conservation projects	3	2	1	0
21. Entrepreneurial training	3	2	1	0
22. General business management development	3	2	1	0
23. Marketing skills development	3	2	1	0
24. Engineering, scientific skill development	3	2	1	0
25. Finance skill development	3	2	1	0
26. Personnel management skill development	3	2	1	0
27. Knowledge of government regulations	3	2	1	0
28. Skills in labor-management relations	3	2	1	0
29. Small Business Development Centers	3	2	1	0
30. AVTI Small Business Programs	3	2	1	0
31. Community College Small Business Programs	3	2	1	0

B. PLEASE INDICATE, BY NUMBER, THOSE SERVICES YOUR FIRM HAS USED:

a) \_\_\_\_\_ b) \_\_\_\_\_ c) \_\_\_\_\_ d) \_\_\_\_\_

## **XV — FINAL COMMENTS**

Do you have any comments, suggestions, or questions regarding the research project or Minnesota programs and services that assist business?

**THANK YOU VERY MUCH FOR YOUR HELP!!!**

If the prepaid, addressed envelope is misplaced, please return to:

Minnesota New Firm Survey; Center for Urban and Regional Affairs (CURA);  
330 Hubert H. Humphrey Center; University of Minnesota;  
301 - 19th Avenue South; Minneapolis, MN 55455.

## Appendix E

### GENERAL DIMENSIONS OF NEW FIRMS STUDY: CONSTITUENT ITEMS

Among the data collected from those initiating new firms were five inventories related to an evaluation of or emphasis on different topics or issues.

Included were:

• Infrastructure importance	20 items
• Start-up problems	43 items
• Current management focus	25 items
• Competitive strategy	14 items
• Existing, and proposed government services	31 items

It may be that the responses to such inventories reflect a smaller number of more general dimensions. If so, multiple-item indicators may be constructed to represent these dimensions.

A smaller set of more general dimensions not only facilitates analysis, by reducing the number of things for consideration, but may lead to more reliable indicators; more reliable indicators are those for which the same result occurs upon repeated measurements.

Factor analysis is a technique designed to assess the extent to which the same pattern of responses is reflected in two or more items. It is used to determine both the number of general dimensions and the items to be included within each dimension.

The results of the factor analysis for these five inventories are reproduced in Tables E.1-E.5. The general dimensions are ranked (from left to right) by the average value of the constituent items. Standard deviations (dispersion) are provided, as well as are estimated reliabilities; the latter cannot be computed for single-item dimensions, however.

All factor analyses and reliability estimates were computed using the appropriate programs from the SPSS-X omnibus statistical package. (See *SPSS-X User's Guide*, 2nd ed. [New York: McGraw-Hill, 1986].)

Table E.1. INFRASTRUCTURE IMPORTANCE DIMENSIONS

	LAND AND SPACE						
	: INFRASTRUCTURE						
	: : LOCAL GOVERNMENT						
	: : : LABOR						
	: : : : ACCESS						
	: : : : : R&D, TRAINING						
	: : : : : AND EDUCATION						
	: : : : : TAXES						
	: : : : :						
Land availability	X						
Land purchase/rental cost	X						
Building space availability	X						
Building space expenditures	X						
Infrastructure		X					
Transportation		X					
Energy costs		X					
Energy reliability		X					
Zoning and land use			X				
Local regulations			X				
Local govt. support for business			X				
Labor costs				X			
Availability of skilled workers				X			
Access to customers					X		
Access to suppliers					X		
Capital availability					X		
Educ. and training opportunities						X	
Access to R & D facilities						X	
Taxes							X
Number of items	4	4	3	2	3	2	1
Standard deviation	.64	.60	.62	.66	.46	.67	.64
Mean importance (very = 2)	1.07	1.20	1.17	1.37	1.58	.85	1.59
Reliability	.78	.80	.64	.55	.46	.67	---

Table E.2. START-UP PROBLEM DIMENSIONS

	PRODUCTS AND MARKETS									
	: EMPLOYEES									
	: : PLANNING									
	: : : FINANCING									
	: : : : ACCOUNTING									
	: : : : : ACCESS									
	: : : : : : INFRASTRUCTURE									
	: : : : : : : SITE									
	: : : : : : : : GOVT									
	: : : : : : : : :									
Understand industry trends	X									
Analyze competition	X									
Find competitive advantages	X									
Develop follow-on product/service	X									
Provide after-sale follow-up	X									
Assess customer needs	X									
Effective selling techniques	X									
Write ad copy, select media	X									
Provide customer service	X									
Pricing products/services	X									
Deliver on time/within budget	X									
Motivate/compensate personnel		X								
Coordinating tasks among units		X								
Finding qualified executives		X								
Finding qualified technical staff		X								
Finding qualified employees		X								
Minimizing start-up team conflict		X								
Preparing a business plan			X							
Using/updating a business plan			X							
Set goals/priorities for personnel			X							
Measuring performance against plans			X							
Clarifying goals			X							
Implementing plans/strategy			X							
Obtaining equity financing				X						
Obtaining debt financing				X						
Establishing a banking relationship				X						
Secure financing to operate new firm				X						
Develop accounting/control system					X					
Managing capital					X					
Managing cash flow					X					
Collecting accounts receivable					X					
Selecting an accountant or lawyer					X					
Access to customers/clients						X				
Access to suppliers/vendors						X				
Access to employees						X				
Appropriate transportation structure							X			
Appropriate infrastructure							X			
Identifying/selecting a site								X		
Locate suitable rental space								X		
Obtaining liability insurance									X	
Coping with regulations										X
Number of items	11	6	6	4	5	3	2	2	2	
Average severity (major = 3)	2.00	1.93	1.91	2.03	2.00	1.65	1.50	1.85	1.97	
Standard deviation	.38	.53	.47	.64	.46	.52	.57	.64	.56	
Reliability	.77	.82	.92	.83	.74	.83	.85	.96	.57	





Table E.4. COMPETITIVE STRATEGY DIMENSIONS

	Technology			
	Products		Marketing	Service
More contemporary, attractive products	X			
Utilize new/advanced technology	X			
Develop new/advanced technology	X			
Better service		X		
Quality products/services		X		
Customize product/service to clients		X		
Lower prices			X	
More effective marketing/advertising			X	
Fast response to changes in markets			X	
Serve those missed by others			X	
Superior location/customer convenience				X
Better, more attractive facilities				X
Number of variables	3	3	4	2
Average emphasis (high = 4)	2.69	1.63	2.36	2.58
Standard deviation	.83	.61	.64	.91
Reliability	.68	.64	.56	.72

Table E.5. EXISTING AND PROPOSED GOVERNMENT SERVICES DIMENSIONS

	TRAINING AND EDUCATION						
	:	TECHNOLOGY AND GROWTH					
	:	:	BUSINESS DEVELOPMENT				
	:	:	:	CAPITAL FINANCING			
	:	:	:	:	SITE LOCATIONS		
	:	:	:	:	:	ENERGY	
	:	:	:	:	:	:	
	:	:	:	:	:	:	
Retraining of existing employees	X						
Training new employees	X						
Entrepreneurial training	X						
General business management development	X						
Marketing skills development	X						
Finance skill development	X						
Personnel management skill development	X						
Knowledge of government regulations	X						
Skills in labor-management relations	X						
Federal procurement assistance		X					
Developing foreign export markets		X					
Working capital financing		X					
Venture, seed capital financing		X					
Joint R&D project development		X					
Applying company R&D in new markets		X					
New technology for productivity gain		X					
Engineering, scientific skill development		X					
Small-business development centers			X				
AVTI small-business programs			X				
Community College Small Business Programs			X				
Land acquisition financing				X			
Building construction financing				X			
Infrastructure financing				X			
Machinery, equipment financing				X			
Tourism market development					X		
New site locations within a county					X		
New site locations within Minnesota					X		
Small business incubator sites					X		
Energy development opportunities						X	
Energy audits/conservation projects							X
Number of variables	9	8	3	4	4	2	
Average interest (high = 2)	1.27	.77	1.12	.89	.59	.56	
Standard deviation	.83	.70	.98	.85	.67	.83	
Reliability	.90	.84	.89	.77	.63	.75	

## Appendix F

### NEW FIRM CONTRIBUTIONS: ASSOCIATIONS WITH SELECTED FACTORS

The first stage of the analysis of factors associated with and, perhaps, preceding new firm contributions (jobs, sales, and out-of-state exports) was to consider the relationship of potential independent variables and new firm contributions. A total of 157 such variables were identified for preliminary analysis, the relationships are presented in the following two tables.

Two types of association are reported. If the potential independent variable was a nominal category (e.g., eight types of industry sectors, initial legal form), the differences in average contributions for different firms are reported in Table F.1. At the top of the table the characteristics of the frequency distributions of jobs, sales, and exports are described. It is clear they are all highly skewed distributions with a very substantial proportion of low values.

If the potential independent variable was interval or ratio, simple Pearson product moment correlations were computed. However, because the distribution of contributions (jobs, sales, and exports) was highly skewed toward the low end, the log transform was computed. The top of Table F.2 presents the characteristics of the frequency distributions of the transformed measures of contributions. As both kurtosis (peakedness) and skewness (asymmetry) for all three variables are close to zero, it is assumed the transformed frequencies are normally distributed. The number of new firms included in the 1985 export distributions is substantially reduced, to 377, because those with no exports were not included in the transformed distribution.

All correlations in Table F.2 utilize the log transform of the contributions. The statistical significance of measures of association is indicated as follows:

- \*\*\* -  $p < 0.000$
- \*\* -  $0.000 < p < 0.01$
- \* -  $0.01 < p < 0.05$

All analysis was done with a weighted sample to ensure the sample was representative of the population of new firms in Minnesota (as reflected in Dun's Market Identifier files). Hence, the number of new firms in the "number of cases" column represent this weighted value. When less than 1,119, it indicates an absence of data on the variables, usually the independent variable. Those cases with a dramatic drop in sample size usually reflect that portion of the questionnaire not completed in the phone interview, the source of data for about one-third of the unweighted sample or about one-half of the weighted sample.

The "variable names" are the identifiers used in the computer files and are included for the convenience of the authors.

Table F.1. NEW FIRM CHARACTERISTICS AND AVERAGE CONTRIBUTIONS

TYPE OF CONTRIBUTION		1986	1985	1985	
		Jobs	Sales	Exports	
			(\$1,000)	(\$1,000)	
Units of Measure					
Mean (Average)		9.13	\$450	\$106	
Standard Deviation		13.95	1,353	541	
Minimum		.00	\$0	\$0	
Maximum		303.00	\$25,000	\$12,000	
Kurtosis (Peakedness)		105.25	130.25	147.17	
Skewness (Asymmetry)		8.14	9.59	10.53	
Valid Observations		1,102	921	936	
Missing Observations		17	198	183	
NEW FIRM CHARACTERISTICS		Variable	1986	1985	1985
[Average Contributions]		Labels	Jobs	Sales	Exports
INDUSTRY SECTOR		DUNSI2			
Agriculture		18	3.70	87	2
Mining		1	2.00	65	22
Construction		109	8.60	445	24
Manufacturing		141	12.30	703	254
Distributive Services		185	7.80	1,055	259
Business Services		176	9.80	467	121
Retail		321	9.00	419	15
Consumer Services		125	6.90	193	6
Health, Education, Social Services		30	14.70	339	46
LEGAL FORM, INITIAL		IVA			
Sole Proprietor		429	4.70	224	22
Partnership		150	7.80	294	26
Limited Partnership		18	15.10	225	57
Subchapter S Corporation		168	13.80	764	146
Corporation		317	12.80	976	258
Franchise		1	60.00	--	--
Other		3	9.00	8,704	0
LEGAL FORM, 1986		IVB			
Sole Proprietor		368	4.10	180	15
Partnership		104	8.20	269	19
Limited Partnership		12	21.30	265	88
Subchapter S Corporation		155	13.60	484	76
Corporation		440	18.10	904	216
Franchise		4	22.80	120	0
Other		6	9.70	3,351	0
SALES DEVELOPMENT PROFILE		SDEVTYP			
Low Start, Low Growth		447	5.30	150	17
High Start, Low Growth		50	17.80	637	44
Low Start, High Growth		117	14.50	1,145	238
High Start, High Growth		64	21.20	2,507	716
EXPORT ORIENTATION		EXPSTAT			
State Based		763	7.60	361	13
Regional Exporter		60	13.90	1,463	320
National Exporter		90	14.50	1,452	1,502

Table F.2. CORRELATIONS BASED ON TRANSFORMED CONTRIBUTIONS

	1986	1985	1985
	Jobs	Sales	Exports
VARIABLES TRANSFORMED TO LOG (BASE 10)			
Variable Names	EMPLOG	SALLOG	OUTLOG
Mean (Average)	.707	2.290	1.730
Standard Deviation	.454	.619	.890
Minimum	.000	.000	.000
Maximum	2.480	4.450	4.080
Kurtosis (Peakedness)	-.214	.575	-.648
Skewness (Asymmetry)	.354	-.149	-.053
Valid Observations	1,094	919	377
Missing Observations	25	200	742

CORRELATIONS WITH CONTRIBUTION					
Variable	Number	1986	1985	1985	
Label	of Cases	JOBS	SALES	EXPORTS	
INFORMAL FINANCIAL RESOURCES					
Personal savings	VB1	607	.26***	.23***	.23**
Spouse/immediate family	VB2	609	.10**	.06	.07
Relatives or other kin	VB3	609	.04	.06	-.06
Friends/business associates	VB4	609	.11**	.09*	.16**
Start team salaries foregone	VB5	604	.17***	.11*	.15*
Employee salary foregone	VB6	609	.04	.03	.11
Credit from suppliers	VB7	608	.13***	.14**	.16*
Other Informal Support	VB8	609	.09	.10	.12
Total informal	VB9	608	.32***	.30***	.30***
START-UP PROBLEMS					
Products and markets	SUP1	550	.15***	.07	.04
Employees	SUP2	412	.21***	.15***	.27**
Planning	SUP3	497	.14***	.11*	.13
Financing	SUP4	511	.19***	.17***	.29***
Accounting	SUP5	559	.14***	.14***	-.07
Access	SUP6	434	.09***	.03	.13
Infrastructure	SUP7	312	.16**	.15**	.20*
Site	SUP8	429	.07	.08	.21**
Local government	SUP9	449	.23***	.20***	.34***
INFRASTRUCTURE IMPORTANCE					
Land and space	IMP1	1,061	.17***	.12***	.08
Infrastructure	IMP2	1,062	.10**	.04	-.03
Local government importance	IMP3	1,053	.14***	.06*	.00
Labor importance	IMP4	1,055	.32	.21***	.02
Access importance	IMP5	1,073	.04	-.01	-.10
R&D, quality of life	IMP6	1,066	.08**	.06*	.00
EMPLOYMENT, 1ST YEAR	IIF15	1,086	.33***	.30***	.28***

Table F.2./continued

Variable Label	Number of Cases	CORRELATIONS WITH CONTRIBUTION			
		1986 JOBS	1985 SALES	1985 EXPORTS	
<b>EMPLOYMENT</b>					
Professional & administrative	PROFFP	1,101	.11***	.01	.07
Skilled percent, initial	SKILLFP	1,101	.11***	.01	.07
Unskilled percent, initial	NOSKLP	1,101	.11***	.01	.07
Professional & administrative, percent 1986	PROFGP	1,101	.04	.04	.06
Skilled percent, 1986	SKILLGP	1,101	.05	.01	.07
Unskilled percent, 1986	NOSKLG	1,101	.11***	.04	.07
<b>SALES GROWTH</b>					
Years since 1st sales	SALAGE	1,029	.06*	.12***	.02
Average sales growth, all years	ASALGRT	673	.30***	.47***	.45***
Average sales growth, year 1	ASALGR1	664	.23***	.39***	.41***
Average sales growth, year 2	ASALGR2	536	.38***	.54***	.47***
Average sales growth, year 3	ASALGR3	394	.41***	.54***	.48***
Average sales growth, year 4	ASALGR4	287	.40***	.53***	.48***
Average sales growth, year 5	ASALGR5	175	.39***	.55***	.43***
Sales, 1st operational year	YR1R	858	.20***	.24	.08
Sales, 1st operational year	YR4R	497	.45***	.60***	.50***
<b>SALES</b>					
Sales within MN, 1985	MNANT	854	.34***	.50***	.23***
Sales adjoining MN, 1985	NERANT	894	.23***	.33***	.47***
Sales rest of U.S., 1985	USANT	900	.20***	.30***	.50***
Sales abroad, 1985	WLDANT	908	.10**	.11***	.19***
Sales, percent in MN	P1	912	-.13***	-.19***	-.66***
Sales, percent in near states	P2	912	.10**	.12***	.31***
Sales, percent in rest of U.S.	P3	910	.10**	.16***	.50***
Sales, percent abroad	P4	910	-.02	.03	.12*
<b>MANAGEMENT FOCUS</b>					
Planning	MF1	596	-.21***	-.18***	-.21**
Financial control	MF2	614	-.14***	-.13**	-.24**
Marketing	MF3	596	-.15***	-.17***	-.24**
Principal involvement/commitment	MF4	612	-.09*	-.12**	.20**
Product/service	MF5	599	.02	.03	.20**
Experience	MF6	612	-.06	-.15***	-.19**
<b>STRATEGIC FOCUS</b>					
Technology	SF1	1,072	.12***	.12***	-.07
Products	SF2	1,081	-.00	.05	-.09
Marketing	SF3	1,077	-.06	-.07*	-.07
Service	SF4	1,077	-.13***	-.04	.21***
<b>RESPONDENTS MAJOR MOTIVES</b>					
Challenge	GOAL1P	1,041	.07*	.03	.09
Income, wealth	GOAL5P	1,040	.10**	.06*	.13*
Autonomy	GOAL6P	1,038	-.12***	-.06*	.07
No alternatives	GOAL9P	1,041	-.09**	-.06*	-.01
Build an organization	GOAL11P	1,041	.14***	.12***	.15**

Table F.2./continued

Variable Label	Number of Cases	CORRELATIONS WITH CONTRIBUTION			
		1986 JOBS	1985 SALES	1985 EXPORTS	
<b>START-UP TEAM CHARACTERISTICS</b>					
Size of start team	XIIA	1,060	.27***	.21***	.15**
Average age	AGEMEAN	1,046	-.08**	.01	.11**
Average years between school and work	AVWORK	1,050	-.09**	.01	.08
Average number of previous positions	AVPOS	1,038	.14**	.07*	.04
Average years in industry	AVININD	1,058	.00	.14***	.13*
Average number of firms started	AVSTART	1,047	.14**	.09**	.17**
Average number of hours per week	AVHOUR	1,052	.09**	.21***	.04
Age range of principals	AGEGAP	1,045	.16***	.21***	.16***
Percent of males on start team	BOYPC	1,060	.08**	.21***	.23***
Percent with high school education	EDHSPC	1,061	-.14**	-.07*	-.11*
Percent with VoTech education	EDVOPC	1,061	-.03	-.03	-.07
Percent with 4-year degree	EDCOGPC	1,061	.16***	.11***	.14**
Percent going from school to new firm	SCHNPPC	987	-.05	-.08**	-.01
Percent established firm to new firm	ORGNPPC	987	.06	.17***	.09
Percent unemployment to new firm	UNEPPC	987	-.07*	-.08**	-.12*
Percent other to new firm	OTHNPPC	987	-.09**	-.17***	.01
Percent working 50+ hours/week	HARDWK	1,052	.09**	.24***	.08
Percent working 60+ hours/week	OVERWK	1,052	.07*	.14***	.03
Percent 10+ years work experience	WKEXHI	1,050	-.06*	.06	.11*
Percent 10+ years experience in same industry	WKEX1H1	1,058	.00	.09**	.07
<b>FORMAL FINANCIAL SUPPORT, INITIAL</b>					
Working capital/line of credit	VIF1	1,005	.17***	.18***	.17**
Term loans: machinery and equipment	VIF2	1,005	.15***	.17***	.15**
Term loans: inventory	VIF3	1,006	.12***	.20***	.14*
Term loans: real estate	VIF4	1,010	.02	.07*	.06
Private stock placement	VIF6	1,008	.12***	.09**	.10
Public stock offering	VIF7	1,010	.03	.01	.02
Venture capital sources	VIF8	1,010	.02	.02	.07
Other equity sources	VIF9	1,010	.08**	.01	.03
State/local government loans	VIF10	1,010	.04	.05	.01
Government subsidies	VIF11	1,007	.00	-.00	.01
Federal government assistance	VIF12	1,009	.03	.10**	.07
<b>FORMAL FINANCIAL SUPPORT, 1986</b>					
Working capital/line of credit	VIN1	1,010	.25***	.26***	.26***
Term loans: machine and equipment	VIN2	1,013	.03	.10**	.11*
Term loans: inventory	VIN3	1,014	.15***	.19***	.18**
Term loans: real estate	VIN4	1,014	.05***	.07*	.10*
Private stock placement	VIN6	1,012	.11***	.08*	.10*
Public stock offering	VIN7	1,015	.07*	.02	.06
Venture capital sources	VIN8	1,015	.04	.02	.07
Other equity sources	VIN9	1,015	.05*	.01	.07
State/local government loans	VIN10	1,015	.07*	.07*	.07
Government subsidies	VIN11	1,015	.04	.01	.04
Federal government assistance	VIN12	1,015	.03	.07*	.08
Percent control retained, initial	VIP1	961	-.12***	-.03	.03
Percent control retained, 1986	VIP2	971	-.03	-.06*	.02



Table F.2./continued

Variable Label	CORRELATIONS WITH CONTRIBUTION				
	Number of Cases	1986 JOBS	1985 SALES	1985 EXPORTS	
<b>INITIAL START-UP PROBLEMS, COUNT</b>					
Products and markets	ISUP1	587	.19***	.17***	.13*
Employees	ISUP2	508	.37***	.32***	.37***
Planning	ISUP3	537	.22***	.10*	.11*
Financing	ISUP4	551	.22***	.24***	.27***
Accounting	ISUP5	582	.14***	.16***	-.06
Access	ISUP6	484	.11***	.06	.16*
Infrastructure	ISUP7	312	.15***	.16**	.21*
Site	ISUP8	429	.05	.20*	.15*
Government	ISUP9	550	.26***	.23***	.28***
Total	ISUPT	611	.35***	.33***	.30***
<b>% START-UP PROBLEMS, FULLY SOLVED</b>					
Products and markets	PFS1	547	-.10*	.01	-.10
Employees	PFS2	432	-.10	.01	-.10
Planning	PFS3	471	.04	.02	.00
Financing	PFS4	456	.06	.16***	.08
Accounting	PFS5	536	-.02	.02	.04
Access	PFS6	349	.11*	.14**	.10
Infrastructure	PFS7	147	.06	.20*	.06
Site	PFS8	306	.08	.01	.02
Government	PFS9	459	-.02	-.02	-.02
Total	PFS7	371	-.03	.06	.08
<b>FULLY SOLVED START-UP PROBLEMS, COUNT</b>					
Products and markets	FSSUP1	567	.03	.05	.07
Employees	FSSUP2	446	.00	.09*	.09
Planning	FSSUP3	489	.03	.05	.06
Financing	FSSUP4	478	.12**	.21***	.05
Accounting	FSSUP5	562	.00	.01	-.02
Access	FSSUP6	364	.13**	.16**	.09
Infrastructure	FSSUP7	157	.08	.15*	.07
Site	FSSUP8	320	.09	.04	-.09
Government	FSSUP9	477	.07	.05	.04
Total	FSSUPT	597	.12**	.16***	.14*
<b>INTEREST IN GOVERNMENT PROGRAMS</b>					
Training and education	GP1	655	.31***	.18***	.12*
Technology and growth	GP2	655	.24***	.19***	.31***
Business development	GP3	654	.07	-.03	-.03
Capital financing	GP4	655	.22***	.18***	.19**
Site locations	GP5	655	.13***	.08*	.05
Energy	GP6	655	.13***	.06	.02
<b>COSTS, PERCENT OF TOTAL</b>					
Materials	PCMAT	588	-.09*	.16***	.06
Physical assets	PCPHY	583	-.04	-.16***	.02
Professional services	PCPROF	580	-.05	-.14**	.00
Training	PCTRAIN	589	.06	-.04	.18**
Research and development	PCRAD	596	.02	-.05	.07
Compensation	PCCOMP	570	.15***	-.01	-.13*
Sales	PCSALE	582	.07	.09	.01
Interest	PCINT	573	-.10**	-.12**	-.19**
Taxes	PCTAX	549	-.15***	-.21***	-.12*

**CURA**

**CENTER FOR URBAN AND REGIONAL AFFAIRS**

330 Hubert H. Humphrey Center

301 19th Avenue South

Minneapolis, Minnesota 55455