

# **Economic Conditions and Participation in Minnesota Post-Secondary Education, 1990–1996**



Prepared by Staff of the  
Minnesota Higher Education Services Office

**June 2000**

Minnesota Higher Education Services Office

1450 Energy Park Drive, Suite 350  
Saint Paul, MN 55108-5227

Telephone                    651 642-0533  
                                      800 657-3866

FAX                            651 642-0675  
E-Mail                        [info@heso.state.mn.us](mailto:info@heso.state.mn.us)  
World Wide Web            <http://www.mheso.state.mn.us>

For the hearing impaired:  
TTY Relay                    800 627-3529

This document can be made available in an  
alternative format by calling 651 642-0533

## Executive Summary

---

For many years, Minnesota educators have assumed that economic conditions affect participation in post-secondary education. Analysis conducted by the Higher Education Services Office provides statistical evidence that these relationships exist in Minnesota.

In December 1998, the Minnesota House Research Department released the report, *Participation of New High School Graduates in Higher Education*, which documented declining participation rates in most areas of the state.<sup>1</sup> The Services Office study agrees with the following statements made in the House Research report:

- The participation rate declined steadily in the 1990s.
- It is more pronounced in Greater Minnesota.
- The decline is not due to an increase in students enrolling in out-of-state institutions.
- The increase in average freshman ACT scores may indicate that the decline in participation is a result of fewer students with lower test scores choosing to go on to college.
- MnSCU institutions have experienced the largest declines in participation rates.

One of the conclusions of the House Research report is that there is no single cause of declining post-secondary participation in Minnesota institutions. A strong economy is cited as one potential factor because high school graduates can easily find jobs without pursuing additional education.

To further explore possible causes for participation rate decline, an analysis of new high school graduate participation rates, focusing on empirical relationships with economic variables, was conducted using county-level data from fall 1990 to fall 1996. Unemployment rates, average wage levels, and per capita incomes were all related statistically to differences between county participation rates and to changes in participation rates during this period.

- ***The level of unemployment*** is related positively and significantly to post-secondary participation, especially at two-year institutions. The higher the unemployment rate in a county, the higher the participation rate. **Unemployment had the strongest relationship to overall participation among the three economic variables.**

Average county unemployment in Minnesota fell from 6.2 percent in 1990 to 5.6 percent in 1996. This finding supports the impression by many two-year campuses that low unemployment reduced post-secondary participation during this period as more new high school graduates chose jobs over further education.

---

<sup>1</sup>A participation rate is defined as the percentage of new high school graduates in a given year that enroll in a Minnesota post-secondary institution the fall term immediately following their high school graduation. Data on the number of new high school graduates are drawn from the Department of Children, Families, and Learning. Data on post-secondary enrollment are derived from a database maintained by the Higher Education Services Office.

Service jobs and retail trade employment constitute the vast majority of new jobs produced in the state during these years. These jobs are staffed disproportionately by young adults in the prime college-going ages.

- **The average wage level** in a county is related negatively to post-secondary participation at public and private four-year institutions. The higher the average wage level, the lower the participation rate. This relationship is strongest for MnSCU four-year institutions. The average county wage grew from \$17,080 in 1990 to \$21,059 in 1996, an increase of 23 percent.
- **The level of per capita income** is related negatively to participation at MnSCU institutions but related positively to participation at private colleges and universities and the University of Minnesota. As per capita income goes up, students attend more expensive institutions. This variable may affect *where* new high school graduates attend more than *if* they attend any post-secondary institution. The average county per capita income level grew from \$15,767 in 1990 to \$20,737 in 1996, an increase of 23 percent.

Overall, the empirical model is strongest with regard to explaining participation rate changes at the MnSCU universities over this period.

**Counties evidencing the greatest decline in participation had larger reductions in unemployment and greater percentage increases in the number of wage and salary jobs compared to other counties.** These counties also tended to have increases in the number of students graduating from high school but decreases in the percentage of graduates taking the ACT exam. This finding indicates that students in communities with improving job markets may decide that they will not attend college (and therefore do not need to take the ACT exam) while still in high school.

The analysis provides further insight into student characteristics that may be associated with a decision to pursue employment over further education immediately after high school:

- Demographically, having a higher ratio of annual high school graduates relative to the 18 to 24 year old population is related negatively to participation, especially at MnSCU institutions. One interpretation of this result is that contemporary increases in the proportion of young people who graduate from high school tend to come from students who are comparatively less academically successful or interested in schooling. Even if schools are able to see these at risk students through to graduation, their achievement and attitudes lead them to consider employment more attractive than post-secondary education, especially when jobs for people with a high school diploma are plentiful. The House Research report drew a similar finding, based on increases in average ACT scores of entering freshmen.
- The percentage of persons of color within a county is related negatively to participation in post-secondary education, confirming other data on attendance patterns by students from minority racial/ethnic groups. Since most of the growth in the numbers of new high school graduates in Minnesota in the next 10 years will come from these populations, participation

rates are likely to continue to decline unless steps are taken to insure that post-secondary institutions are open and supportive.

A vibrant economy can offer decent jobs to all willing workers without the need for further formal education after high school. The 1990s were good times for most Minnesotans. The highest paying jobs, however, are still likely to be held by people with post-secondary education. In an economic downturn, if past trends repeat, people with limited education will be the most vulnerable. Minnesota needs to be sure that people of color do not disproportionately miss out on the long term benefits of higher education.

Confirmation of the economy's influence on the decision to attend post-secondary education immediately after high school is tentative since the analysis is based on only six years of data, and not all possible causes were included. Clearly, multiple factors are at work. This report, however, does suggest that overall participation and attendance at certain institutions may have declined throughout the 1990s, in part, because of the strong economy.

## Introduction

---

While students may begin post-secondary education at any age, public attention often focuses on new high school graduates, the traditional source of post-secondary enrollments. One reason for looking at decisions made immediately after high school is the belief students are most likely to complete a post-secondary education program if they attend before family and other adult responsibilities compete for their time and attention.

Without individual student data on attitudes and other factors which affect decisions to attend college, it is not possible to speak definitively about the causes of changes in participation. Analysis of changing participation within different geographic areas, namely Minnesota counties, however, can lead to tentative inferences about individual decision making. Students go to high school, work, make post-secondary plans, and their families are taxed and spend money at a local level. County level data capture these dynamics better than planning regions or development districts, which are too large, and census tracts, which are too small.

Traditionally, Minnesota has been proud of its high rates of college attendance. Recent evidence, however, indicates a decline in the proportion of Minnesota new high school graduates who enter post-secondary education immediately following high school.

A House Research Department report describes the decreases in Minnesota participation rates between 1987 and 1996 as follows:

- Do not appear to be made up within a year or two after graduation.
- Do not appear to be a national trend since other states have not experienced the same changes.
- Are found in all size districts and parts of the state.
- Are greater among young women than young men.
- Are greater among Asian and white students more than other racial/ethnic groups (but these groups are still lower in participation).<sup>2</sup>

One possible cause of declining participation is the strong economy. Students may be deciding to enter the labor market directly after high school rather than enroll in further education as they did in the competitive job market of the 1980s. This paper examines evidence for this hypothesis using county data.

---

<sup>2</sup>*Participation of New High School Graduates in Higher Education*, Research Department, Minnesota House of Representatives (December 1998).

## Sources of Data

---

This analysis is based on changing participation rates among new high school graduates from 1990 to 1996, by county. Enrollment data used in this report are from the Student Enrollment Record Data Base collected and maintained by the Higher Education Services Office (MHESO) and from high school graduate data collected by the Department of Children, Families and Learning.

Participation rates in this paper refer to the *percentages* of high school graduates enrolled in a Minnesota post-secondary institution the fall immediately after high school graduation.

County economic and demographic data come from the Bureau of Labor Statistics and the U.S. Census Bureau. Average county American College Test (ACT) Comprehensive scores and the number of students in a county taking the ACT in a given year were supplied by the ACT Research Division.

Approximately 40 percent of the public two-year college enrollments are missing data on the year of high school graduation. Participation rates for two subsets of the community and technical colleges (each progressively more stringent with regard to data viability) were calculated and regression models evaluated. The results show that the trend lines over time for these subsets as well as the interpretations of their regression coefficients are virtually the same as when all enrollments are included. This check lends support to the assertion that decreases in participation rates in this sector are not a result of missing information. Empirical findings for the two-year sector are therefore included.<sup>3</sup>

The report is divided into three sections:

- **Overview:** A look at higher education enrollment and statewide economic trends from 1990 until 1996.
- **Method of Analysis:** What variables were chosen and why and the statistical results.
- **Findings:** How do economic changes relate to participation?

---

<sup>3</sup>The remaining institutional sector, private two-year institutions, is not included in this analysis, because many of these schools fail to report their data every year.

## Overview

---

Participation in Minnesota post-secondary institutions has been declining since the mid 1980s. Table 1 details the change in participation rates by type of institution from Fall 1990 through Fall 1996.<sup>4</sup> All sectors evidenced a decline from their rate at the start of the decade except private colleges and universities, which by 1996 were approximately where they started in 1990. State university participation rates declined by 2 percent from 1990-96, followed by public two-year colleges which declined by 1 percent, and the University of Minnesota which declined by 0.8 percent.

**Table 1: Participation Rates for Minnesota High School Graduates Graduating Within the Last Year and Enrolling As New Entering Students at Minnesota Institutions the Following Fall Term**

	1990	1991	1992	1993	1994	1995	1996
University of Minnesota	8.0%	7.6%	7.3%	7.1%	6.7%	6.9%	7.2%
MnSCU Four Year Universities	11.0%	10.6%	9.4%	9.1%	8.9%	8.8%	9.0%
MnSCU Two Year Colleges	14.4%	15.1%	16.6%	15.4%	13.2%	14.4%	13.4%
Private Four Year Colleges	7.4%	8.2%	10.3%	9.4%	8.5%	8.0%	7.5%
All Minnesota Institutions	40.8%	41.5%	43.6%	41.0%	37.3%	38.1%	37.1%

*Source: Minnesota Higher Education Services Office*

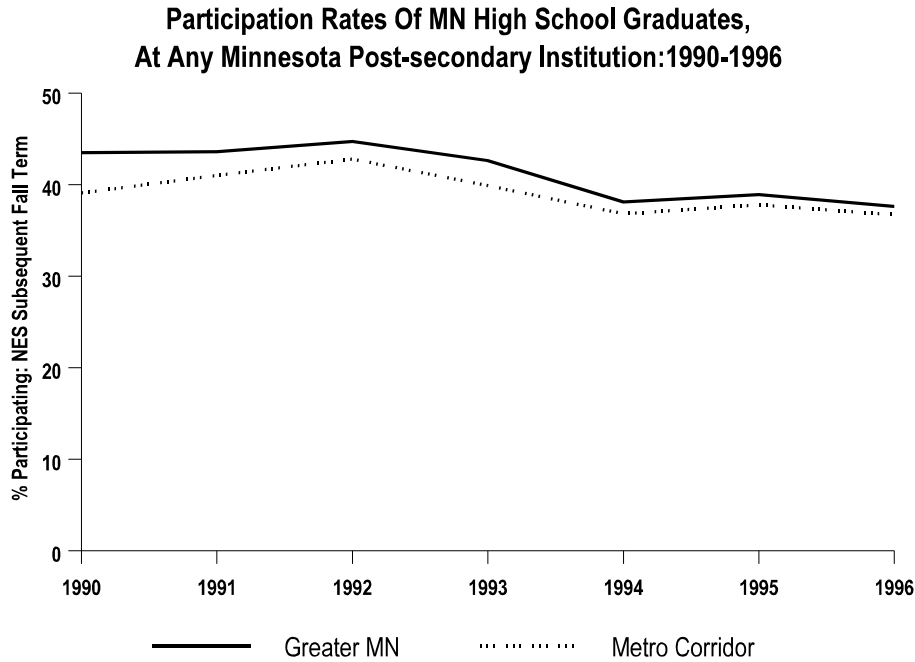
Do these rates vary across Minnesota? Figure 1 presents post-secondary participation rates for Greater Minnesota high school graduates (regional development districts 1 to 6, 8 to 9) compared with Metropolitan Corridor high school graduates (districts 7, 10, 11).

---

<sup>4</sup> Participation rates calculated for this report differ from calculations made by House Research, but the trends are the same.



Figure 1



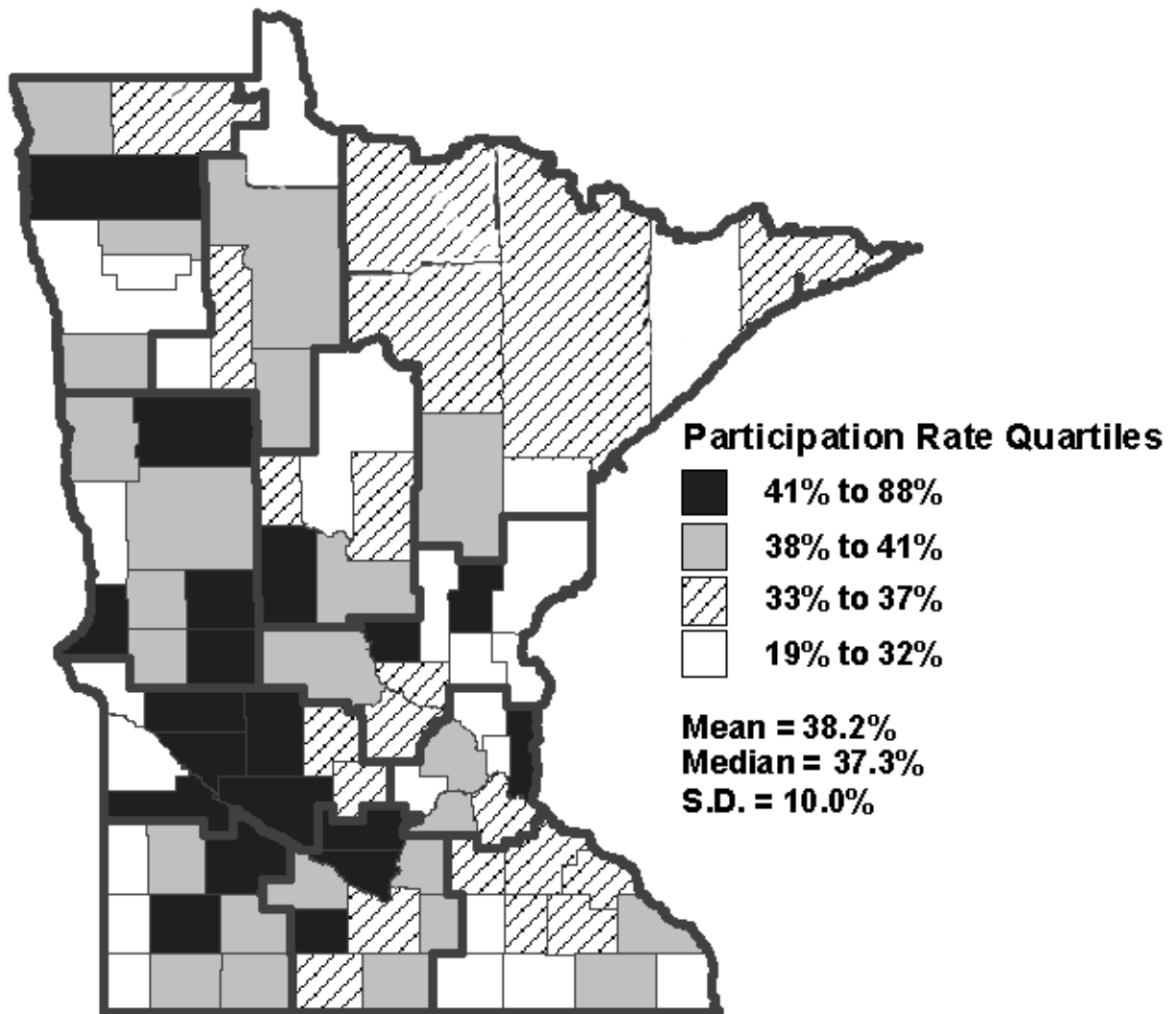
The University of Minnesota and private colleges and universities enroll larger shares of Metropolitan Corridor graduates than their shares of Greater Minnesota graduates. For MnSCU institutions, the reverse is true; both MnSCU two-year and four-year institutions attract a larger share of Greater Minnesota graduates than graduates from the Metropolitan Corridor. These differences are almost certainly due to geographic location. The University of Minnesota-Twin Cities and most private institutions are located in the Metropolitan Corridor while most MnSCU institutions are located in Greater Minnesota.

It is clear, however, that declining trends were similar in the Metropolitan Corridor and in Greater Minnesota. How did participation vary by county? The maps on the next two pages present participation rate data for Minnesota's 87 counties. Figure 2 shows rates by county for fall 1996 while Figure 3 shows which counties had the greatest change in participation from 1990 to 1996. Figure 3 reinforces the observation that the participation rate decline was felt in all parts of Minnesota. However, declines were generally more dramatic in Greater Minnesota, specifically in some counties in the western half of the state.

What might underlie the participation rate decline from 1990 to 1996?

Figure 2

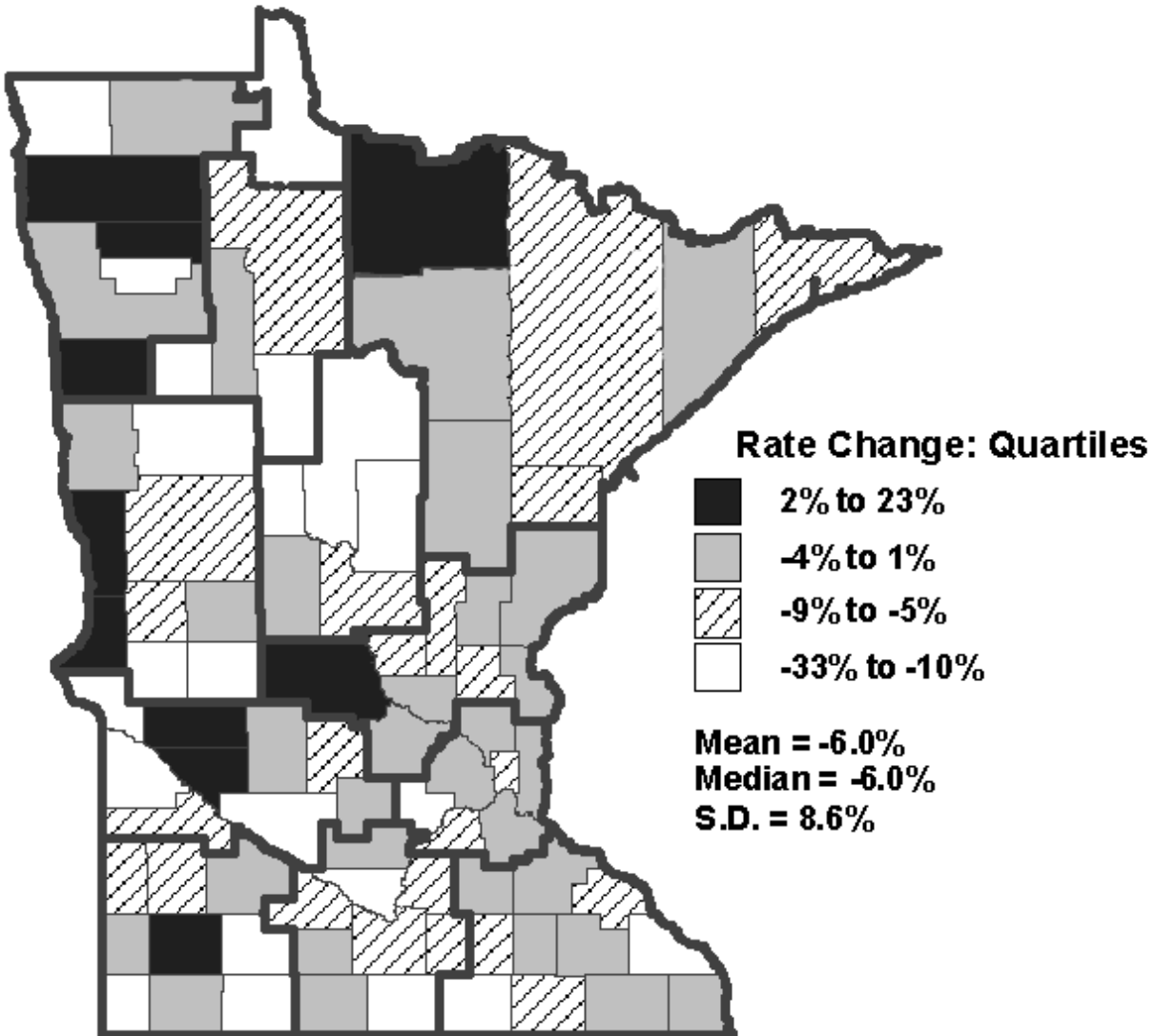
Participation Rate of New Minnesota High School Graduates  
Enrolling at Any Minnesota Post-Secondary Institution, Fall 1996



Source: Minnesota Higher Education Services Office

Figure 3

Change in the Participation Rate of New Minnesota High School Graduates  
Enrolling at Any Minnesota Post-Secondary Institution, 1990 to 1996

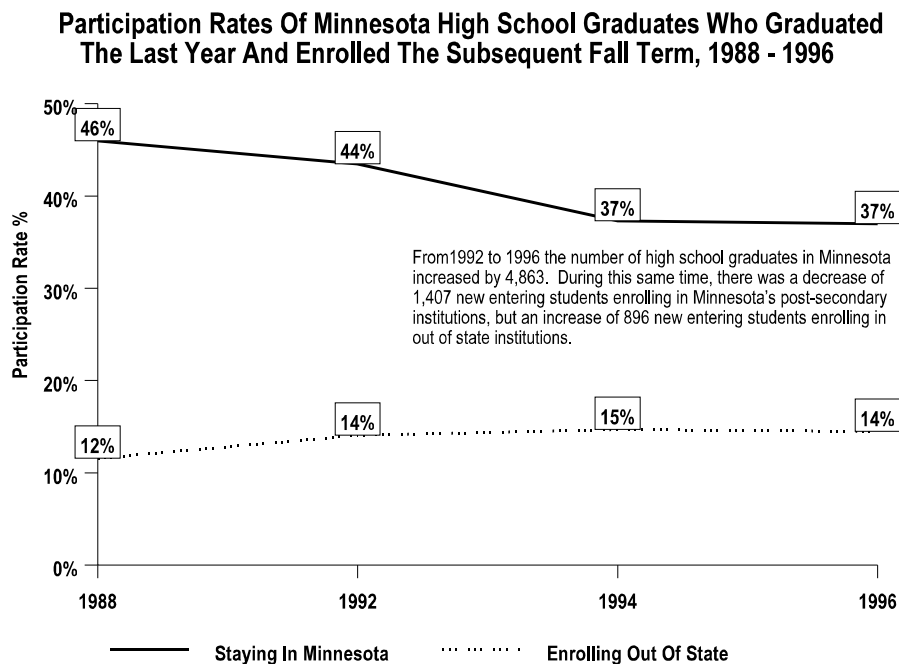


Source: Minnesota Higher Education Services Office

## Out-of-State Enrollments

The most obvious explanation to consider is whether more Minnesota new high school graduates were enrolling in out-of-state institutions. It is possible that overall post-secondary participation of new Minnesota high school graduates did not decline, but where students enrolled may have changed. Figure 4 reveals that while the percentage of Minnesota high school graduates going out of state increased between 1988 and 1992, from 1992 to 1996, this percentage was relatively stable.

Figure 4



Sources: Minnesota Higher Education Services Office; National Center For Educational Statistics; *Digest of Education Statistics*

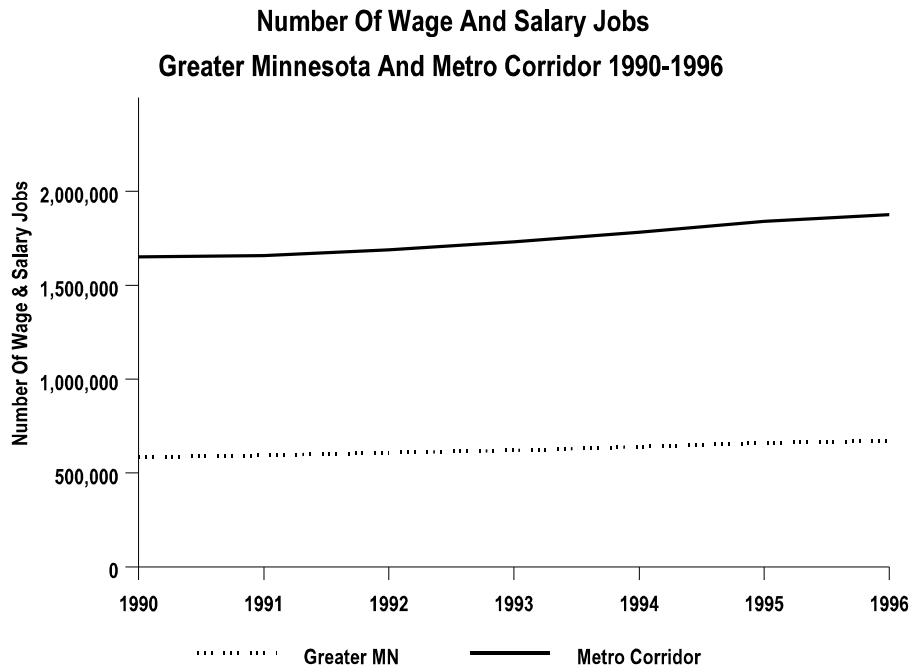
## Economic Changes in Minnesota 1990–96

Many observers have identified the economy as a factor in statewide decline in higher education participation. What have the economic trends been in this period?

Economically, the 1990s were prosperous for Minnesota. Figures 5 to 8 show trends in economic indicators for Greater Minnesota and the Metropolitan Corridor. The number of jobs and average annual wage levels increased, while unemployment dropped sharply in the last three years of this time frame. Per capita income increased statewide. New jobs were especially plentiful in the Metropolitan Corridor.

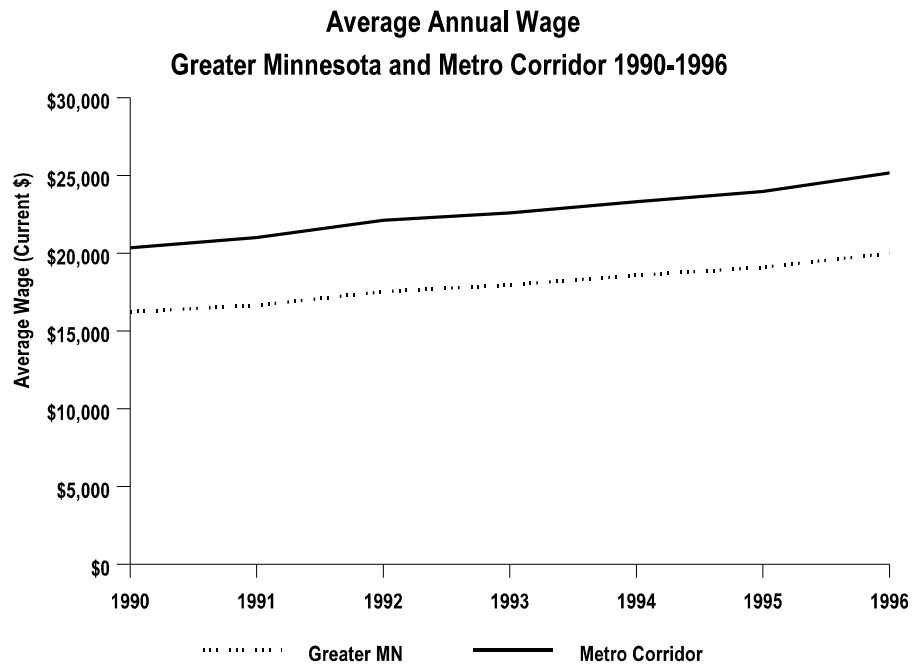
Were these broader economic changes related empirically to participation among Minnesota's new high school graduates?

Figure 5



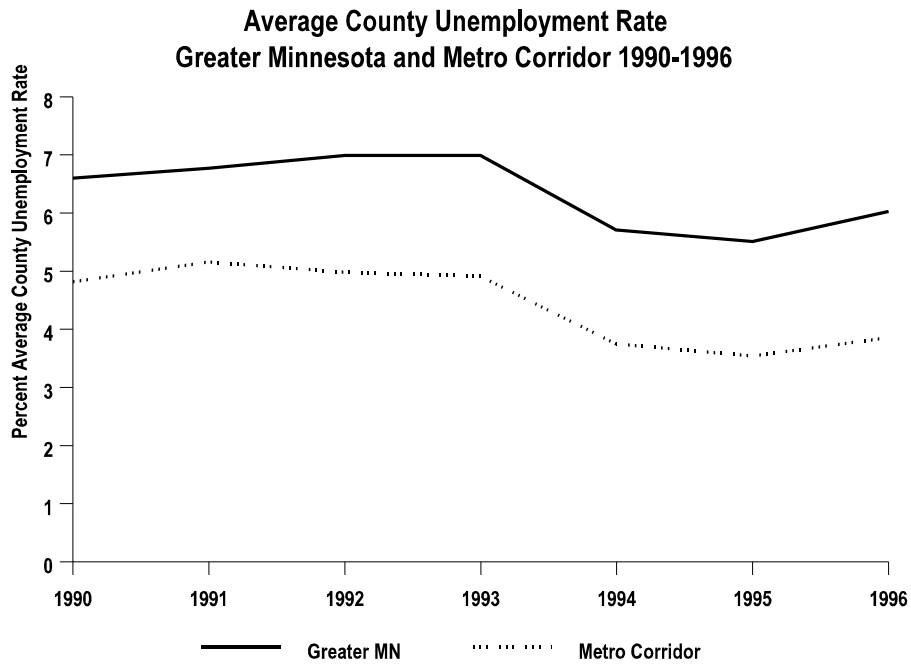
Sources: Minnesota Higher Education Services Office; Bureau of Labor Statistics.

Figure 6



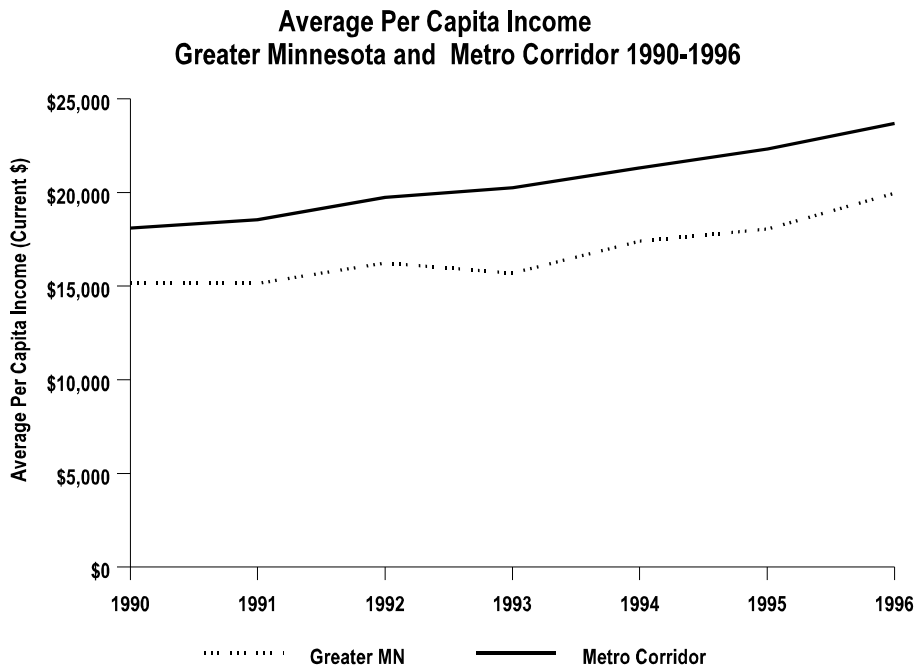
Sources: Minnesota Higher Education Services Office; Bureau of Labor Statistics

Figure 7



Sources: Minnesota Higher Education Services Office; Bureau of Labor Statistics

Figure 8



Sources: Minnesota Higher Education Services Office; Bureau of Labor Statistics

## Method of Analysis

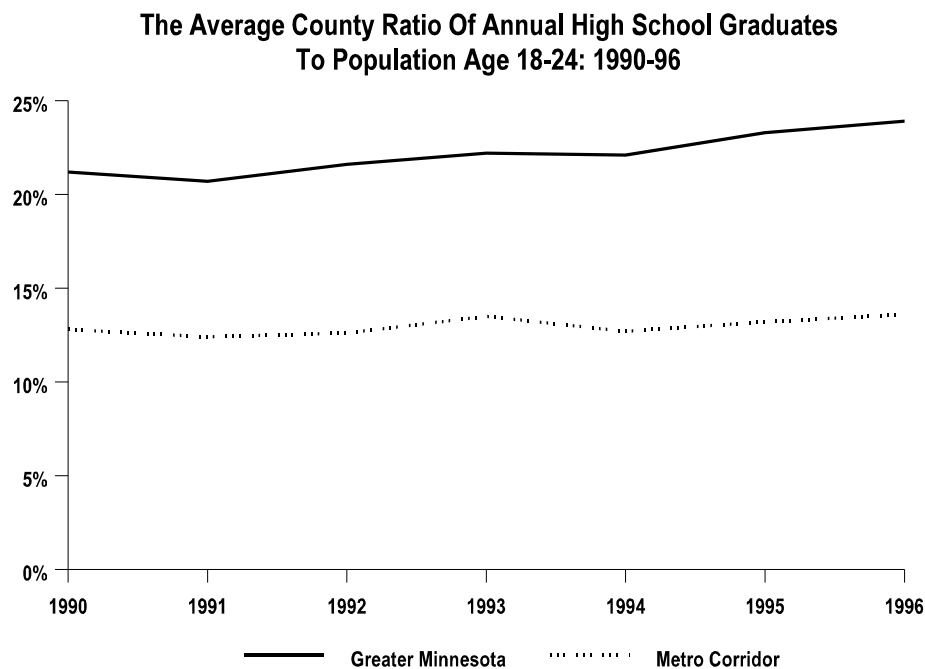
---

Using the Minnesota county as the unit of analysis, participation rates were statistically linked to these economic measures and other relevant control variables<sup>5</sup>. A county-level statistical analysis was performed. Results follow after a brief review of the control variables included in the model.

### Control Variables<sup>6</sup>

#### 1. Average County Ratio of HS Graduates to Population Age 18-24

Figure 9



---

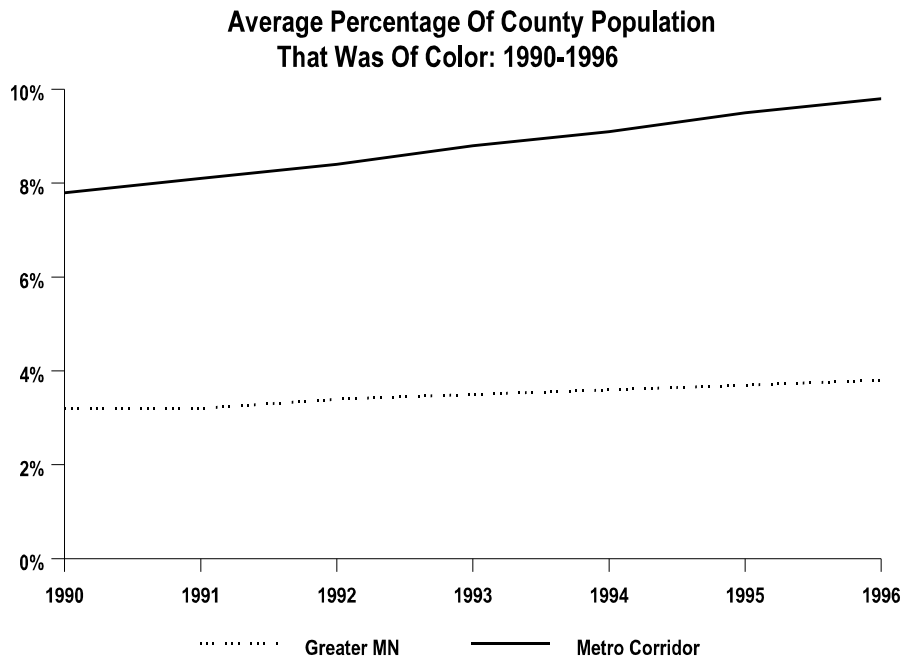
<sup>5</sup>The number of wage and salary jobs in a county was not included in the model because this variable is highly correlated with unemployment rate.

<sup>6</sup>Control variables are county variables which are theoretically relevant and which need to be included in the model so that their influence can be statistically controlled, decreasing the chance that any apparent relationships between the economic variables and participation rate are false.

**Rationale:** The proportion of high school graduates in the population aged 18 to 24 is a proxy for graduation rates at the county level. In counties where more youths have high school diplomas, a larger proportion of potential recruits are exposed to pro-college messages from the committed college-goers. A working hypothesis was that the more high school graduates in the college-age population, the greater the chance that more students will be oriented to post-secondary education and will participate. The average ratio has been increasing in greater Minnesota while it has remained relatively stable in the Metropolitan Corridor.

## 2. Average Percentage of County Population That Was of Color

Figure 10



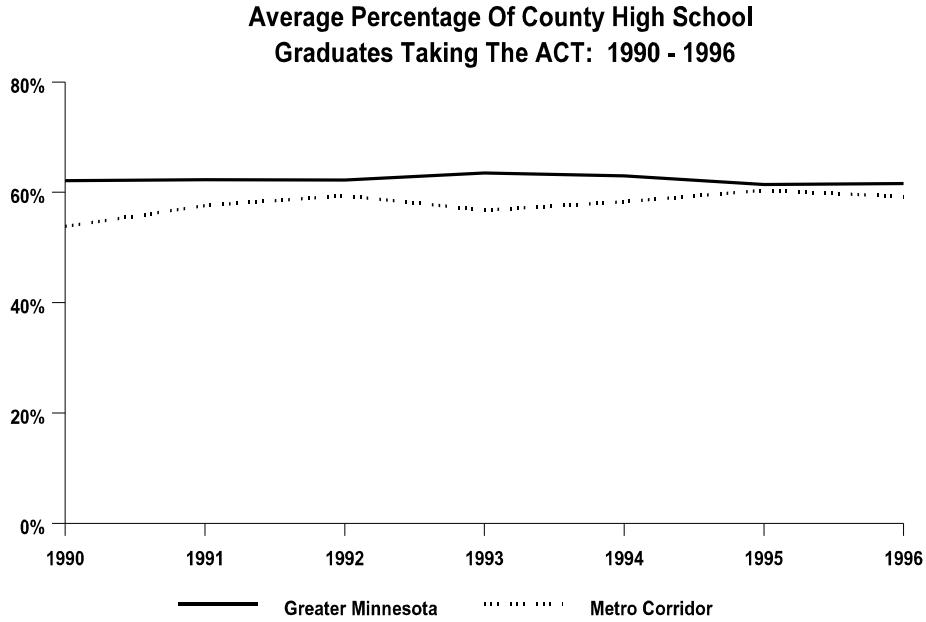
Sources: Minnesota Higher Education Services Office; U.S. Census Bureau

**Rationale:** High school graduates of color have historically participated in post-secondary education at lower levels than the white population. An increasing proportion of new high school graduates from minority racial/ethnic groups could therefore be associated with changes in participation rates.



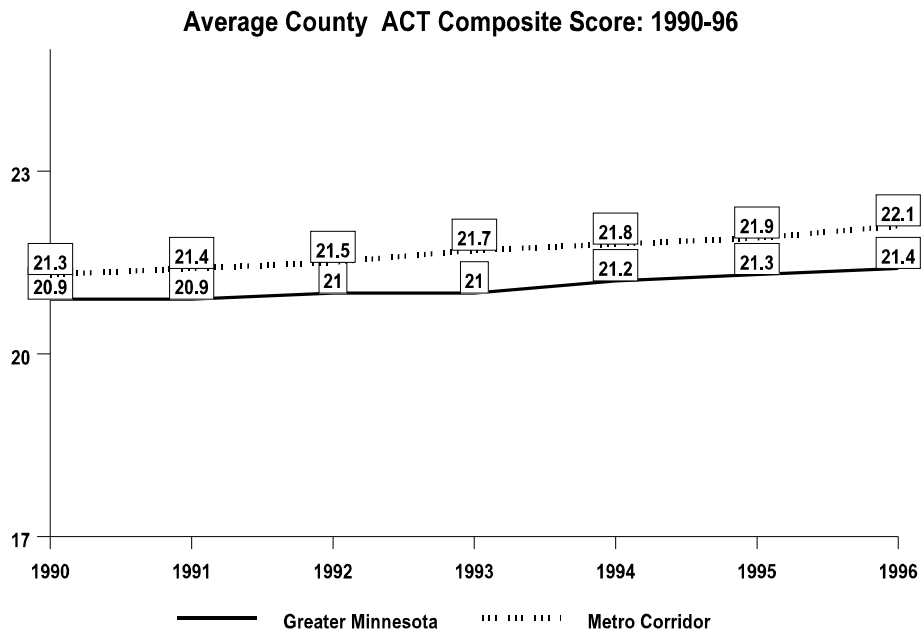
### 3. Average Percentage of County HS Graduates Taking the ACT Test

Figure 11



### 4. Average County ACT Composite Score

Figure 12



**Rationale:** The ACT or SAT is required for admission at all in-state baccalaureate institutions. The ACT is taken by most college-bound high school students in Minnesota. If the percentage of a county’s high school graduates taking this test or the performance of a county’s pool of high school graduates has declined, the county participation rate might be affected because fewer students would be eligible to attend four-year institutions. Grade point average or other performance data are not available at the county level.

### “Dummy” Control Variables

To control for geographic variation in participation, dummy variables for Regional Development Districts 1-10 were included (Region 11-Twin Cities is used as the baseline/comparison district). Figure 13 shows Minnesota’s 11 Regional Development Districts. Regions were chosen because there are distinct regional socioeconomic cultures in Minnesota (agriculture in the western Red River Valley, mining in the northeastern Iron Range) which span a number of counties.

Using the control variables along with economic measures, a multiple regression model was estimated for county participation rates in each Minnesota post-secondary sector and for the whole post-secondary system. The variable labels, definitions, and the statistical results follow.

#### Independent Variable Labels

**Economic Measures:**

Average Annual Wage: County Average Annual Wage Level (Bureau of Labor Statistics)  
 Unemployment Rate: County Unemployment Rate (Bureau of Labor Statistics)  
 Per Capita Income: County Average Per Capita Income (Bureau of Labor Statistics)

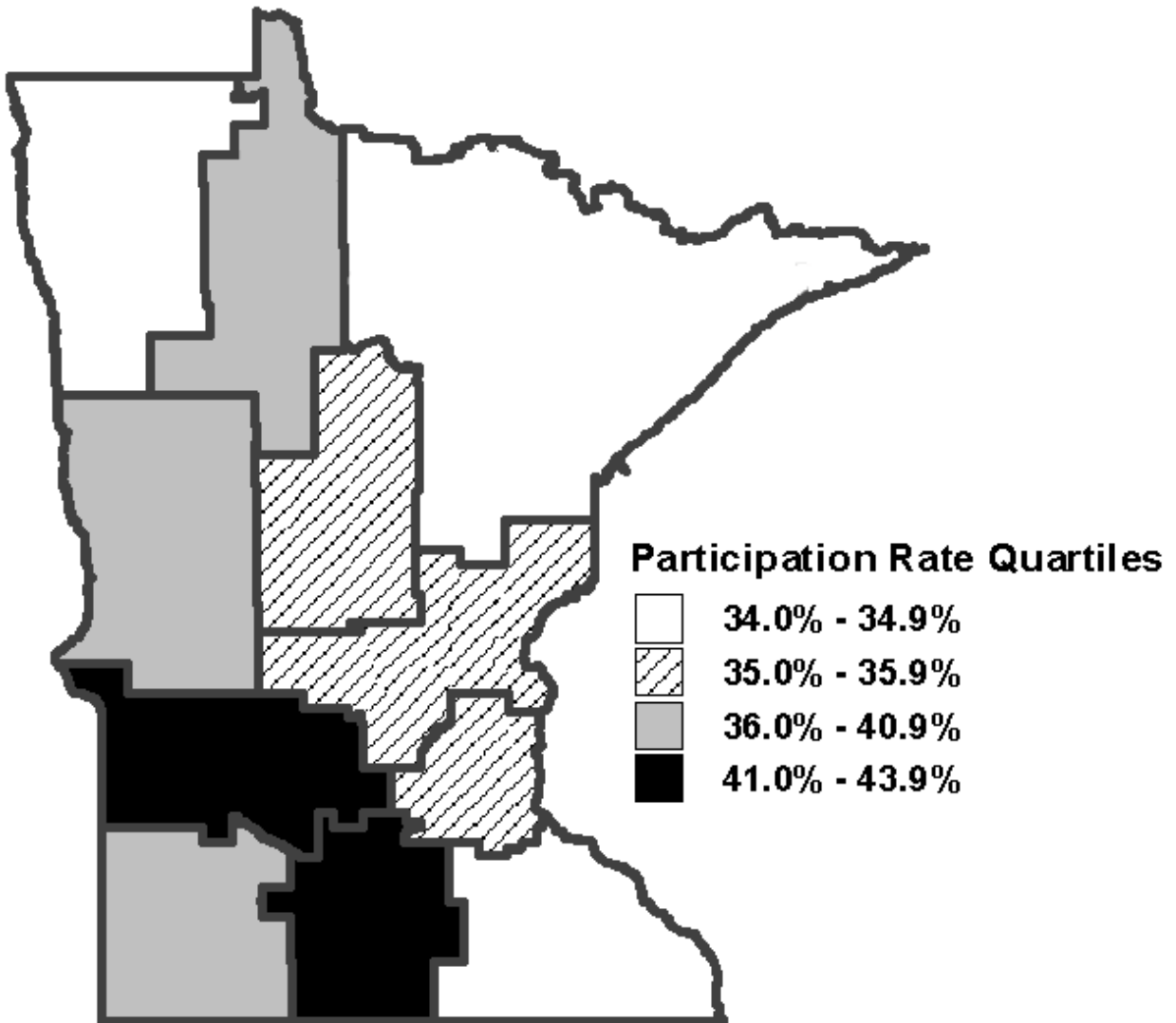
**Controls:**

% HS Grads/Pop 18-24: % County # of HS Graduates/Population 18-24 (U.S. Census Bureau)  
 % Minority Pop: % County Population Not “White, Non-Hispanic” (U. S. Census Bureau)  
 Avg. ACT Composite: County Average ACT Composite Score (ACT Research Division)  
 % HS Grads Taking ACT: County % of HS Graduates Taking ACT (ACT Research Division)

REGION\*: County Regional Development District Location (1=yes; 0=no)

Figure 13

Participation Rate of New Minnesota High School Graduates, Fall 1996  
by Minnesota's Regional Development Districts



Source: Minnesota Higher Education Services Office

**Table 2: Minnesota County-Level Post-Secondary Institution Participation Rates 1990-1996, Regressed (Unstandardized Coefficients) On County Economic & Control Variables, and Regional District Dummies<sup>a</sup>, By Institutional Sector**

Indicator	University of Minnesota	MnSCU Four Year Universities	MnSCU Two Year Colleges	Private Four Year Colleges	All Institutions
Constant	7.307	29.295***	43.463***	1.900	80.492***
<b>Economic Measures</b>					
Average Annual Wage <sup>b</sup>	-.196**	-.303*	.117	-.338**	-.719**
Unemployment Rate	-.177**	.121	.863***	.132	.949***
Per Capita Income <sup>b</sup>	.056	-.291*	-.074	.402	.106
<b>Control Variables</b>					
% HS Grads/Pop 18-24	-5.399***	-30.730***	-22.472***	-13.786***	-70.763***
% Minority Pop	-.065	-.002	-.278***	-.096	-.440***
Avg. ACT Composite	.088	-.551	-1.354**	.269	-1.498*
% HS Grads Taking ACT	.084***	.156***	-.022	.049*	.263***
<b>State Planning Region</b>					
REGION 1	-1.700*	-0.517	-1.657	-2.970**	-6.928**
REGION 2	-1.450	4.255**	-2.061	-2.115	-1.439
REGION 3	-0.088	-5.088***	2.500	0.538	-2.231
REGION 4	-4.344***	0.882	3.131*	-0.464	-0.774
REGION 5	-3.352***	-0.668	5.154**	-1.486	0.896
REGION 6	-4.854***	3.847***	8.949***	-0.254	7.601***
REGION 7	-3.582***	1.233	-2.974*	0.303	-4.993*
REGION 8	-6.638***	2.849*	6.369***	-4.000***	-1.475
REGION 9	-4.543***	7.955***	-1.340	1.454	2.956
REGION 10	-5.060***	-0.221	2.262	-2.166*	-5.154*
<hr/>					
N=609					
Adjusted R <sup>2</sup>	.268***	.484***	.272***	.206***	.354***

\* p<.05; \*\*p<.01; \*\*\*p<.001; (significance levels <.10)

a: Region 11 (Twin Cities) is used as the comparison, or baseline region.

b: The metric for Average Annual Wage and Per Capita Income is thousands of dollars.

## Findings

---

While the estimated models range from weak to moderate, they provide insights into what might be behind the drop in participation rates as well as confirming that there are regional variations. Table 2 points to relationships between the chosen economic variables and participation by institutional sector.

**1. Changes in unemployment rates are positively and significantly related to participation at two year public colleges, empirically supporting anecdotal reports. Unemployment rates, however, were negatively related to participation at the University of Minnesota.**

This finding provides evidence that when jobs are relatively scarce, more new high school graduates will choose to enroll in post-secondary education and that the additional enrollments are most likely to occur in public two year colleges. Conversely, when jobs are plentiful, fewer students are likely to enroll.<sup>7</sup> Average county unemployment fell from 6.2 percent in 1990 to 5.6 percent in 1996, and Minnesota's falling participation rates may be partially due to this trend.

If there is a link between employment opportunity and higher education participation, what kinds of jobs might be attracting new high school graduates, pulling them away from post-secondary education?

As shown in Table 3 below, employment in the services and retail trade industries rose throughout the 1990s, providing 1.4 million jobs in 1994, nearly half (46 percent) of all jobs in the state. Moreover, in the seven-county Twin Cities metro area, which produced close to 50 percent of the new entering students in Fall 1996, two-thirds of the new jobs in the services and retail trade industries generated in the state since 1989 were located in this same seven-county region. In sum, the growth in service and retail jobs statewide may have claimed a number of potential higher education participants, but more research and investigation are needed to understand this relationship.

---

<sup>7</sup>National studies have also associated higher levels of unemployment with increases in higher education enrollments. Kroncke, Jr., and Ressler (1993) found a similar relationship between higher unemployment and increased enrollment in public post-secondary education. Both Heller (1999) and Kane (1999) found significant relationships between state unemployment rates and enrollments in community colleges but only weak relationships with enrollments in public four year institutions. Dayhoff (1991) provides empirical evidence for a relationship between higher levels of job displacement and increased college freshmen enrollments.

**Table 3: Gains in MN Employment by Type and Industry 1989-1994 (Number of Jobs in 1994)**

---

Agricultural services, forestry, fisheries and other	31.6%	(25,510)
Services	23.9%	(839,156)
Retail Trade	13.5%	(500,147)
Transportation and public utilities	13.4%	(134,832)
Wholesale trade	12.3%	(150,034)
Government and government enterprises	10.3%	(373,135)
Construction	8.6%	(125,956)
Finance, insurance, and real estate	8.6%	(214,769)
Manufacturing	6.8%	(432,418)
Mining	4.7%	(9,345)
Farm	-10.6%	(109,438)
<b>Total Minnesota Employment</b>	<b>13.0%</b>	<b>(2,914,740)</b>

---

Source: MN Planning: *Population Notes*: "Minnesota Jobs Grew Vigorously From 1988 To 1994." June 1996.

**2. Although the relationships are weak, changes in per capita income are negatively related to participation at MnSCU two- and four-year institutions and positively related to participation at private colleges and the University of Minnesota.**

Per capita income is positively related to participation at any Minnesota institution. Stafford, Lundstedt, and Lynn, Jr. (1984) obtain a similar result at the state level, where personal income is a positive predictor of the percentage of population participating in higher education. However, the sectoral results in Table 2 provide evidence that as family incomes improve, students are more likely to attend more expensive institutions. Conversely, enrollments in less expensive and more affordable institutions are likely to increase when family incomes fall. Per capita income increases during the 1990s may therefore have contributed to reduced participation rates at MnSCU institutions. The average county per capita income level grew from \$15,767 in 1990 to \$20,737 in 1996, an increase of 32 percent.

**3. Increases in average annual wage levels in a county are associated with significant decreases in participation in private colleges, state universities, and the University of Minnesota. There was no statistically significant relationship between changes in county average annual wage levels and enrollment at two-year public institutions.**

This finding suggests that when jobs are relatively well paying and plentiful, relatively more high school graduates will opt for employment rather than post-secondary education. Neumark and Wascher (1995) find that increases in the minimum wage reduced the likelihood that teenagers would be enrolled in either secondary or post-secondary education. Increases in wages between 1990 and 1996 may have led more students to work after graduation, lowering the state's participation rates. The average county wage level grew from \$17,080 in 1990 to \$21,059 in 1996, an increase of 23 percent. Wage increases were especially prevalent in retail positions which are often held by young workers.

- 4. Changes in the percentage of high school students taking the ACT are positively related to changes in enrollments in public and private baccalaureate institutions but negatively related to enrollments in public two-year institutions. In addition, increases in counties' average ACT Comprehensive scores are negatively related to participation rates at MnSCU institutions but positively related to participation rates at private colleges and the University of Minnesota.**

Nearly all Minnesota baccalaureate institutions require the ACT as part of their admissions process. Counties with higher percentages of high school graduates taking the ACT should see higher participation rates at four-year institutions. Moreover, those with higher scores should have higher participation rates at the state's more academically selective institutions. Thirty-seven of 87 Minnesota counties posted an actual decrease in the percentage of high school graduates taking the ACT between 1990 and 1996.

- 5. Increases in high school graduation rates may be associated with reductions in the post-secondary participation rates. Post-secondary participation rates are lower in counties that have a relatively high annual ratio of the number of high school graduates compared to the 18 to 24 year-old population.**

This finding is the opposite of what was hypothesized. Success in raising the percentages of students who graduate from high school may mean that students who are less academically inclined or socially integrated are supported through to graduation. Although these students do graduate, they could be less interested in continuing immediately in post-secondary education than students who graduate with less intervention.

Table 4 below lends credence to this inference. Counties that experienced the greatest declines in post-secondary participation had increases in the annual ratio of high school graduates to the 18 to 24 year-old population. These counties also showed decreases in the percentage of high school students taking the ACT, an early indicator of the intent to enroll in post-secondary education. Counties with the greatest declines in participation also had reduced unemployment rates, providing readily available jobs to high school graduates with limited interest in post-secondary education. In addition, when the percentage of high school graduates taking the ACT was used as the dependent variable in the regression model instead of a participation rate, its relationship with average annual wages was negative and statistically significant (findings available upon request). This means that the higher the annual average wage in a county the lower the percentage of high school graduates taking the ACT, controlling for all other variables in the model.

**Table 4: Mean Variable Levels for Counties in Lowest/Highest Quartiles of Participation**

Variable	% Change in Participation Rate: 1990-1996	
	Worst	Best
% Change in Average Wage 1990-1996	24.67%	26.78%
<b>% Change in Number of Jobs 1990-1996</b>	<b>19.80%</b>	<b>15.24%</b>
% Change in Per Capita Income 1990-1996	29.58%	32.48%
% Change in Population Age 18 to 24 1990-96	-.80%	-.78%
Change in Unemployment Rate 1990-1996	-.93	-.54
% Change in Population of Color 1990-1996	.54%	.50%
Change in ACT Composite Score 1990-1996	.60	.53
<b>% Change in Grads Taking the ACT, 1990-96</b>	<b>-2.98%</b>	<b>2.78%</b> <sup>(.100)</sup>
<b>% Change in Number of HS Grads 1990-9</b>	<b>14.16%</b>	<b>-7.50%</b> <sup>(.001)</sup>
		(Statistically significant)

**6. Increases in the percentage of counties' populations of color are negatively related to participation rates, especially at public two-year colleges.**

A majority of the projected growth in new high school graduates in the next 10 years will occur among students of color. Minnesota's participation rates could continue to fall unless steps are taken to encourage their enrollment in post-secondary education.

**7. The magnitudes of the relationships between participation rates and average wage, annual ratios of high school graduates to the 18 to 24 year old population, and per capita incomes are highest for the state university sector.**

The explanatory power of these variables is strongest with regard to Minnesota state universities. The results provide empirical support for the House Research speculation that Minnesota high school students who are academically and economically "marginal" are most likely to choose immediate employment over post-secondary education when economic conditions are good. MnSCU campuses are most affected because historically they have served these populations.

The following scenario is plausible with regard to the economic relationships: a) when few jobs are available, a high proportion of new high school graduates goes on to post-secondary education; b) when jobs become more available, students who might have attended two-year institutions begin to chose employment over post-secondary education; and c) as wages increase, students who might have attended four-year state universities begin to be attracted away from college attendance as well.



## Conclusion

---

This analysis empirically examined the relationship between economic change and participation rate decline in Minnesota from 1990 to 1996, using county-level data. Findings suggest that good economic conditions had an impact on the participation rates of new high school graduates throughout the state.

Confirmation of the economy's influence on the decision to attend post-secondary education immediately after high school is tentative since the analysis is based on only six years of data, and not all possible causes were included. During the time period in question, Minnesota experienced changes in tuition and fee charges and admissions policies. Clearly, multiple factors are at work, and further research is needed to understand the complex dynamics of individual decision-making.

Starting with the Class of 1999, the Minnesota Department of Children, Families & Learning will be able to share information from its High School Follow-Up Survey with the Higher Education Services Office. In the Follow-Up Survey, a representative sample of Minnesota high school graduates answers a comprehensive array of questions about their high school experiences and educational/employment plans after graduation. Information about a student's family structure, socioeconomic status, and family involvement in post-secondary education planning is included in a matched parent/guardian survey.

The Services Office will be able to link this information to its Student Enrollment Record Data Base and identify which students actually enroll or do not enroll in a Minnesota post-secondary institution the fall term after high school graduation. This linkage will allow further research into the multiple factors affecting the decision to attend post-secondary education immediately following high school.

## References

---

Dayhoff, Debra A. 1991. "High School and College Freshmen Enrollments: The Role of Job Displacement." *Quarterly Review of Economics and Business* 31(1): 91-103.

Heller, Donald E. 1999. "The Effects of Tuition and State Financial Aid on Public College Enrollment." *The Review of Higher Education* 23(1): 65-89.

Kane, Thomas J. 1999. *The Price of Admission*. Brookings Institution Press.

Kroncke, Jr., Charles O. and Rand W. Ressler. 1993. "The Alchian-Allen Effect in Higher Education: Public Versus Private Enrollment." *Economics of Education Review* 12(4): 345-349.

Neumark, David and William Wascher. 1995. "Minimum Wage Effects on Employment and School Enrollment." *Journal of Business and Economic Statistics* 13(2): 199-206.

Stafford, Kathy L., Lundstedt, Sven B. and Arthur D. Lynn, Jr. 1984. "Social and Economic Factors Affecting Participation in Higher Education." *Journal of Higher Education* 55(5): 590-608.