

**Draining Away: Who's Leaving the State and  
Where are They Going?**

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## Executive Summary

As Wisconsin attempts to transform its economy away from its traditional manufacturing base and towards a more service-oriented, high-tech model, preoccupation with the state's so-called brain drain has grown significantly. This study represents an attempt to determine precisely who amongst our college-educated work force are leaving the state, and where they are going.

To that end, we worked with the Office of Alumni Affairs at the University of Wisconsin Oshkosh to obtain data on every one of the 2043 students that graduated from the institution in the years 1980 and 1990, and supplemented this data with a survey sent out to graduates in each year asking them questions about their family and labor market status. We found that 25% of the 1980 alumni and 18% of the 1990 alumni in our sample were no longer residing in the state. Since a greater proportion of the older alumni than the younger alumni have left the state, our results are not consistent with the idea that any brain drain is merely the result of our college graduates spending a few years experiencing the rest of the country before returning to the state to work and raise a family.

What makes what brain drain we do observe problematic for Wisconsin is that the alumni who are no longer in Wisconsin appear to be those that would be especially beneficial for a modern economy. Alumni with Ph.D.'s or law degrees are much more likely to live in another state, as are those who studied science, math, or any medical-related fields. The alumni who left the state also demonstrate a greater allegiance to the work force than those who remain in the state.

But most importantly, we find that the average graduate living outside of Wisconsin earns significantly more than his Wisconsin contemporary. For the full-time workers in our survey, the wage difference between in-state and out-of-state residents is \$7,200, and the difference for 1980 graduates is even greater, at \$10,700.

Using two graduating classes from only one University of Wisconsin Institution is by no means a representative or complete sample, but nevertheless the data in this report provide a good snapshot of what is happening to the state's college graduates. No matter how this data is interpreted it is not good for the state: Either our most talented workers are leaving to earn more money in other states, or else the opportunities for the college graduates are much greater elsewhere.

Wisconsin's politicians have indicated a desire to change the focus of their job recruitment strategies and to put more emphasis on luring high-tech or biotech companies and industries. We feel that in order for this strategy to be successful, it is important that the state keep their best graduates in the state. It is our hope that this study helps our politicians and policymakers understand who is leaving the state and why they are leaving.

## Introduction

After a decade of solid employment growth, the Wisconsin economy has been languishing lately, with several factors contributing to this malaise. First, the state's industrial policy has focused almost exclusively on attracting and maintaining manufacturing jobs through tax breaks and direct subsidies. While manufacturing jobs typically pay above-average wages, the manufacturing sector of the economy is notoriously cyclical, and its overall share in the Wisconsin (and U.S.) economy has continued to shrink. Because of our heavy reliance on manufacturing, Wisconsin's unemployment rate rose above the national unemployment rate for the first time in over a decade, chiefly due to layoffs in the manufacturing sector during the recent economic downturn.

Secondly, at the same time that the manufacturing sector has shrunk, state income growth has slowed. Our nonmanufacturing employment growth has been concentrated in lower paying industries, rather than the higher paying jobs we would have hoped for. According to the Bureau of Economic Analysis, Wisconsin's annual per-capital income is roughly \$28,000, \$4,000 (i.e. 12.5%) below Minnesota and Illinois.

One explanation for this pattern may be the "brain drain": that a large number of highly skilled Wisconsin natives are leaving the state to pursue careers elsewhere in the country. Such an exodus would imply that, although our state educational institutions are succeeding in creating an educated work force, some (perhaps policy) barriers must exist, that deter modern, high-tech companies from coming to Wisconsin to take advantage of those skills, education, and training. The purpose of this research report is to explore the state's so-called "brain drain", and to determine exactly who is leaving, where they are going, and what factors might be influencing their departure. To that end, we gathered data on the 1980 and 1990 graduating classes of the University of Wisconsin Oshkosh, conducting an in-depth survey of a substantial fraction of the two cohorts. Our intention is to go beyond anecdotal analysis, to quantify the extent of any brain drain among UWO college graduates, as well as to identify any significant differences between those alumni who remain in the state and those who left Wisconsin behind.

The state spends a large amount of money on the University of Wisconsin system, currently more than \$1 billion *per annum*. With such a large expenditure, the state would presumably like some kind of a return on its investment, and the exodus of talented college graduates reduces its return as well as the popular support for a quality university system.

We are reluctant to declare precisely what is causing the brain drain in Wisconsin. A realistic explanation, we feel, is that the state's moribund industrial policy, its reputation as a high tax state, its slow growth in personal income, and the departure of its talented workers are all interconnected. By examining the factors connected with the brain drain, we hope to be able to shed some light on some of the other factors of the Wisconsin economy as well.

## The Survey

To analyze Wisconsin's brain drain, we surveyed two graduating classes from the University of Wisconsin Oshkosh, where we both are professors. While we recognize the problems with generalizing our findings to other population groups -- we are only looking at college graduates, from only one regional institution -- the broad patterns of behavior that we view, and their policy implications, may reasonably approximate those of the entire population of UW system alumni of the same graduation years.

Our survey contains data on the 2,043 people who graduated from the University of Wisconsin Oshkosh in the years 1980 or 1990. Two separate classes were chosen in order to give us a sufficiently large data set. We used graduating classes a decade apart to explore how the passage of time affects the picture we observe. In short, we are trying to take two different snapshots at one point in time of two different graduating classes.

The 1980 and 1990 graduates are at very different steps on the career ladder. Given that the typical graduate is 22-25 years old at graduation, the 1980 graduate has long completed any postgraduate education, has probably begun (or even almost finished) raising a family, and has likely been at one job for a relatively long period of time. The 1990 graduate, on the other hand, is in his early to mid 30's, and may still be taking graduate classes or else has just completed a postgraduate degree. We deliberately chose graduating classes that had been out of school for at least a decade to obtain more appropriate estimates of post-graduation income from the sample. A class that had recently graduated would include a substantial number of students in graduate school or in jobs unrelated to their eventual careers, and thus would give an artificially low average wage.

Our initial goal was to take one graduating class and examine their labor market situation at different stages, but we discovered that asking people to reconstruct their career and salary history is simply not feasible. Using students from the same university who are a number of years apart allows us to reasonably approximate the typical career and employment history.

The extent to which a college education plays in one's lifetime success is, of course, debatable. While it is true that college graduates make considerably more money than high school graduates over their lifetimes, much of it is simply due to the fact that those with more skills go off to college in the first place. For our purposes, however, we don't really care: we are only concerned with selecting a sample of current and former Wisconsin residents who have a modicum of labor market skills, using cohorts of college graduates is as good a way of any to find such people. Comparing the two classes and their situation in the spring of 2001 gives us a clue as to what happens to UWO graduates over two decades of post-college employment.

Appendix One contains the survey sent out to the alumni via mail in March 2001. They were asked questions about their family and marital situation, their postgraduate education, current employment status, occupation, and income, the number of jobs they have held in the past and how long they have been at their current job, and hours worked in a typical week. In order to encourage participation, the alumni were allowed to access a Web Site to more easily answer the questions, and all those who responded were entered into a raffle for 2 \$250 gift certificates.

We obtained the names and addresses of alumni from the UW Oshkosh Office of Alumni Affairs. Shortly before our survey the office hired an outside firm to update their addresses, and no questionnaires were returned to us as undeliverable. Thus, we believe that we had reliable locational data on every single graduate of the two cohorts.

## Who Responded?

Nearly 700 people responded to the questionnaire, although not all of those people answered all questions, for a response rate of roughly 30%. As surveys go, this is a relatively high response, which we in part attribute to our raffle. However, a question that invariably arises when any survey is done is whether there is any response bias; that is, are the people who responded any different than the general population of people surveyed?

The general practice is often to simply ignore the question if the results support the hypothesis of the researcher, and to select the sample to give the best possible results. In order to determine whether selection bias hampers our survey, we use the information we have on all graduates to determine whether the respondents differ significantly from the general population. We were able to examine whether the geographic distribution of those who responded differs from those who did not respond. The difference is negligible; 79.3% of our respondents report living in Wisconsin, versus 80.0% of the overall graduating classes. Broken down within the state, we find that 30% of the entire graduating class live in the area with a zip code beginning with a “53”, and 50% live in a zip code beginning with “54”. These proportions are within 1% of the same breakdown for those who responded to the questionnaire, and none of the differences are statistically significant.<sup>1</sup>

The University of Wisconsin Oshkosh is not necessarily a campus with students representative of the rest of the UW System; we chose it instead of other campuses mainly for convenience. There are, of course, some differences in average ability among students in the UW system; for instance, UW Madison students generally have higher ACT scores and higher high school GPAs. However, among the regional UW system schools UW Oshkosh is safely ensconced in the middle of the pack. Although extrapolating our results to the entire UW system may be unsound, we do not see any significant differences between the regional campuses that would suggest that their alumni behave on average any differently from ours.

The University of Wisconsin Madison certainly gets the bulk of the top students that go to public universities in the state, but overall only about 25% of all UW system graduates are at Madison, according to the UW System Office of Policy Analysis and Research. Thus, it may be safe to say that our results are representative of the 75% or so of the UW graduates that don't attend Madison.

## Is there a Brain Drain?

Our data set of the 2,043 graduates shows that about 20% of each class is no longer in the state. Figure One shows the regional breakdown of the 2,043 graduates of the two classes, broken down by state and, within Wisconsin, by region of the state.

Roughly 45% of our population remained in northeast Wisconsin, which includes the Fox Cities, Door County, and outlying areas. Another 35% of the graduating class lives in the rest of the state, mainly in Madison, Milwaukee, and the southern one-third of the state.

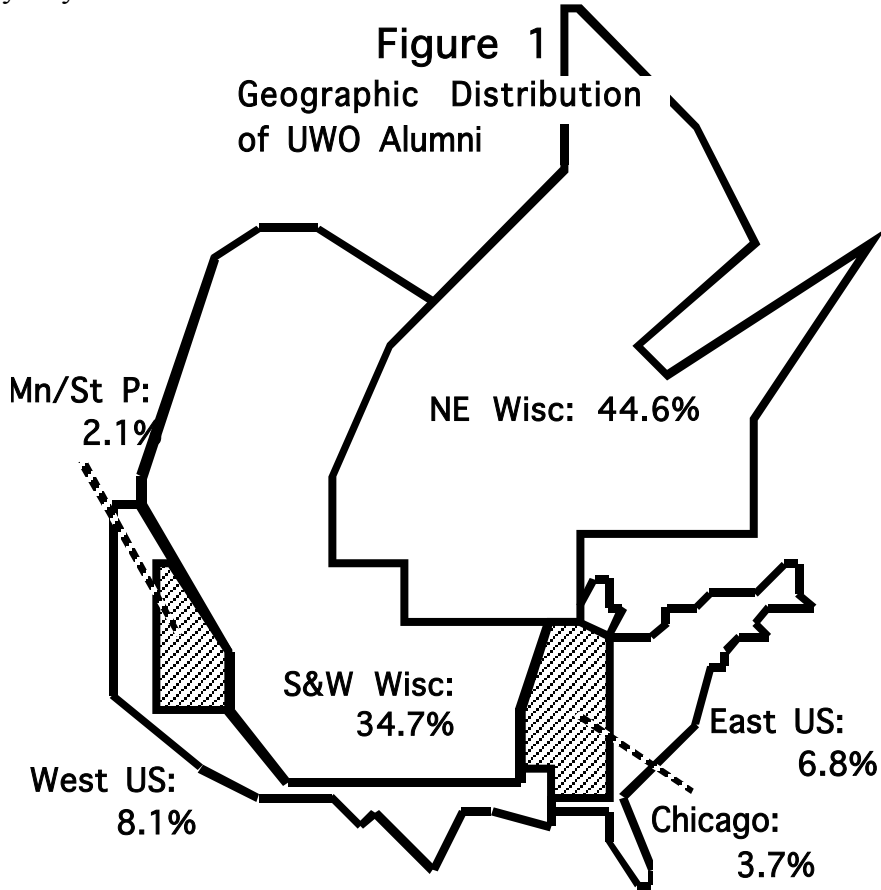
Those that left the state had two principal destinations, namely the Sun Belt or Chicago. 80 graduates live in the Chicago metro area, or 20% of the group that left the state, and

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<sup>1</sup> The Chi-Square tests used to determine whether these populations were statistically different have a P-value of .41 and .36. As a reference, only a p-value under .05 is sufficient to conclude any significant differences.

another 110 live in the Midwest but outside of Chicago and Wisconsin. Minnesota has 47 alumni. There are 104 alumni in the South, 86 in the west, with most of the latter representing California, and a few stray souls in New England. The UWO Alumni Office reports only 1 person in either class living outside of the U.S.

Our survey backs up the consensus in this area; we do have a significant proportion of graduates leaving the state, and those who leave tend to go towards Chicago or Minneapolis if they stay in the Midwest.



## What is the Income Difference Between In-state and Out-of-state Alumni?

The most striking result of our survey is that those alumni who left the state have significantly higher incomes than those who remain in the state. To some degree this is to be expected; given that there is a significant psychic cost to moving away from their home state for the typical person, only those who receive a relatively high wage offer in another state are likely to leave.

However, the difference between in-state and out-of-state incomes is dramatic, and much larger than we expected. The average income for the Wisconsin residents in our sample is roughly \$47,000, as compared to slightly over \$58,000 for alumni living outside of the state. Table 1 limits our comparison to those who have full-time jobs, excluding the housewives, househusbands (of which there were a not insignificant number) and those who are currently unemployed or have part-time jobs. The income difference grows slightly, with Wisconsin residents averaging \$51,100 and the out-of-state alumni earning \$62,900.

**Table 1**  
**Average Income, Full Time Employed Graduates**

	1990 Alumni	1980 Alumni	All Alumni
WI Res.	\$ 48,098	\$ 56,940	\$ 51,144
Others	\$ 55,877	\$ 71,250	\$ 62,905
Difference	\$ 7,779	\$ 14,310	\$ 11,761

It is also informative to break down the income by graduating class, since the 1980 graduates make significantly more than the 1990 graduates thanks to their additional experience and job tenure. If we just compare the 1980 graduates and control for all other variables that impact income, the difference in income is over \$14,000. For the 1990 graduates, this income difference is roughly half that, at \$7,800.

The stark difference in incomes is not good news for Wisconsin no matter how it is interpreted. One way to explain the income gap in our study is that it is a manifestation of higher wages in other states. We do know that to some extent this is true; recent census data show that the average income in Wisconsin is roughly \$28,000, which is about \$4,000 below the average income in Illinois and Minnesota. Of course, our sample is a highly skilled sample and not at all indicative of the overall population; to our knowledge no decent information exists regarding the wages of college-educated workers in different states.

Another possible interpretation is that the wages of college-educated workers are not that much different in Wisconsin than in other states, but that the alumni in our sample that have left the state are especially talented workers. No doubt this is true to some extent: While we know some of the basics that affect someone's lifetime income, there are still many other factors influencing income that cannot be captured by any survey.

However, we can control for some things that do affect wages, such as experience, tenure, and graduate education, so we adjusted our estimation of the wage difference to reflect these possible differences using regression analysis. By estimating a linear equation that explains differences in wages, and by using the variables listed above and also including a binary variable for the state of the alumni, we can capture as best as possible the effect that the state of residence alone has on income. We find that even when we control for all these factors, the income

premium that we can attribute to having a job in another state falls only slightly, to \$7,200. This income premium can be divided into a \$5,500 premium for the more recent 1990 graduates, and a \$9,000 premium for the earlier 1980 graduates; however, the difference between the two is not statistically significant.<sup>2</sup> The regression results that produced these estimates can be found in Table 2.

**Table 2**  
**Income of In State and Out of State Alumni**

<b>Variable</b>	<b>Coeff.</b>	<b>T-stat.</b>	<b>Coeff.</b>	<b>T-stat.</b>
Constant	1152.9	2.41	1676.7	1.79
1990 Alum	-0.548	-2.28	-0.812	-1.73
WI Res	<b>-7.197</b>	-2.63	<b>-8.987</b>	-2.32
90*WI			<b>3.452</b>	0.65
Hrs/week	0.774	5.28	0.7738	5.28
2nd Job	-8.333	-2.45	-8.357	-2.46
Full time	79.180	4.27	79.19	4.27
Employed	-68.020	-3.86	-67.82	-3.85
JobYrs	0.762	3.39	0.7569	3.37
Business	16.677	6.22	16.565	6.16
Nursing	7.379	2.05	7.313	2.03
Math/Sci	8.297	2.14	8.380	2.16
MBA	16.910	2.68	17.193	2.72
MA/JD/PhD	7.271	2.08	7.319	2.09

Looking at the income data from a different perspective, our UWO college graduates earn on average between 66% and 100% more than the general state population. We cannot attribute this entire difference to the college education earned at UWO: the difference is understated by the fact that the state average income includes a significant proportion of college graduates, and it's overstated by the fact that those who choose to go to college are typically brighter and would have done better in the labor market even without a college education.

Nevertheless, we feel safe in stating that UW Oshkosh graduates get a very good return on their investment of a college education. The important policy insight here, is that they can in general substantially improve their return by moving to another state.

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<sup>2</sup> The t statistic on the WI\*90 coefficient is less than 2. Therefore, we cannot conclude that the earnings premium rises over time, after controlling for other things.

## Who is Leaving the State?

**a. Those that have been in the labor market longer.** A greater proportion of the class of 1980 has left the state; nearly 26% of the 1980 alumni show an address out of the state, as compared to only 16.8% of those who graduated from the class of 1990 (Table 3). We feel that this is significant because it refutes the notion that our brain drain partly reflects the desire of younger college graduates to experience the rest of the country before returning to the state and settling down. Instead, our graduates slowly trickle out the state and any returnees are outweighed by the exiting of others.

**Table 3**  
**Exit by Graduation Year**

	1990 Alumni	1980 Alumni	All Alumni
WI Res.	986	635	1621
Exit	200	222	422
%Exit	16.9%	25.9%	20.7%

Again, there is no sample selection bias to speak of with this statistic, as it reflects the data we have on virtually every graduate from the two classes. While it is true that some people disappear off the radar screen of their former friends and employers, this isn't typically a problem with college-educated workers, thanks in no small part to the Internet.

**b. Those with degrees in math and science** The state's politicians have recently changed the focus of our industrial policy, deciding to place an emphasis on attracting high-tech and biotech firms into the state. A big stumbling block in this effort has been the perception of a dearth of qualified high-tech workers in the state, but our data shows that this is not necessarily the case.

If the state is producing too few graduates with the math and science backgrounds that high-tech employers seek, those few graduates that we do produce should be quickly snapped up by the state's existing high-tech employers, with a relatively small fraction needed to seek employment outside the state. In fact, we observe just the opposite: alumni employed either in math or science related fields (including social sciences and computer science) are 50% more likely to leave the state than other alumni. This suggests that it is not the supply of high-tech workers, but the demand for them, that is the problem.

Students who received a nursing degree are also more likely to leave.<sup>3</sup> Twenty six percent of alumni with nursing degrees who responded to the questionnaire are no longer currently residing in the state. While nursing in the past has been denigrated as a temporary profession for women planning on raising a family, the quality of student going into the nursing profession has remained high, and their allegiance to the labor force has increased in recent years, according to other studies. Women (and men) who study nursing today probably have more in common with those studying math and science than with those who study education.

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<sup>3</sup> The difference in proportions between nursing and math/sci professionals is not statistically significant, in part because of the small sizes of these two groups. However, the other differences, dividing the entire sample into Education, Business, Nursing/Math/Sci., and Other, are statistically significant, with a Chi-Square statistic of 10.39.

**Table 4**  
**Occupation and Exit**

	WI	Exit	%Exit
Education	136	20	12.8%
Other	112	26	18.8%
Business	148	38	20.4%
Nursing	60	21	25.9%
Math/Sci	42	18	30.0%
<b>All</b>	<b>498</b>	<b>123</b>	<b>19.8%</b>

This exodus of nursing graduates is particularly troubling, since Wisconsin is currently experiencing a dramatic nursing shortage across the state<sup>4</sup>, and since UWO has perhaps the largest College of Nursing in the UW System. Since nursing shortages are however a nationwide phenomenon, the relatively high exodus rate of nurses may be due either to greater shortages elsewhere than Wisconsin faces, or more effective policies to resolve those shortages than Wisconsin offers.

On the other end of the spectrum, alumni with education degrees are much more likely to remain in the state, with only 13% of those with a teaching degree residing outside of Wisconsin. This probably reflects a number of different factors: First, teachers' salaries in Wisconsin are relatively high, and the variation in salary for teachers in the country is not great, meaning that the potential gains for teachers who leave the state to teach are negligible. To put it another way, a new teacher is going to get somewhere around \$25,000 to \$35,000 no matter where they go, (and are more likely to get that \$35,000 in Wisconsin) but freshly minted computer science or math graduates have a much wider range of possible salaries, and a nationwide job search might result in a significantly higher salary than just remaining in the state.

Another factor dampening the emigration of new teachers is the teacher certification. UWO graduates who have completed the required coursework are automatically certified to teach here; if they want to teach in another state, they will have to meet whatever differences in certification requirements that state imposes. Also, since much of their university coursework was education certification specific, if they were to leave teaching their salary options would undoubtedly not be nearly as attractive as those for, say, the math and computer science graduates.

Finally, the vast majority of teachers in the state are employed by the public school systems and thus participate in the state pension plan. The state's poorly-designed pension plan essentially serves as a golden handcuff, forcing those who leave after a few years to forego half of their earned pension benefits. In addition, it is often difficult for a teacher with a few years of experience to get credit for that experience applied towards his salary when applying for a new job, so most teachers who leave the state are facing both an income and a pension value loss.

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<sup>4</sup> According to the Wisconsin Health and Hospital Association, roughly 10% of all hospital nursing positions across the state are vacant. State Rep. DuWayne Johnsrud (R-Eastman) has introduced a bill banning forced overtime in hospitals, as a proposed solution to this shortage.

Those with business degrees are no more likely to leave the state than anyone else. The rate of emigration for alumni with business degrees is 20.4%, which is almost precisely the same as the emigration rate for the overall population.

**c. Those with law degrees or Ph.D's.** While those with master's degrees in education stay, those with graduate degrees in other fields are more likely to leave, and alumni who subsequently earned a law degree or a Ph.D. are much more likely to leave. For instance, of those alumni who reported having either a J.D. (for *juris doctor*, or a law degree) or a Ph.D., over half reside outside of Wisconsin (Table 5).<sup>5</sup>

**Table 5**  
**Graduate Degree and Exit**

	WI	Exit	%Exit
MA Educ	64	6	8.6%
MBA	28	3	9.7%
None	367	86	19.0%
MA Other	33	18	35.3%
JD/PhD	8	11	57.9%
All	500	124	19.9%

However, we are reluctant to say that this statistic is a reflection of a brain drain. First, there were only 19 respondents who reported having a Ph.D. or J.D., so the sample size may simply be insufficient to fully examine this question. Second, the very nature of the J.D. and the Ph.D. almost necessitate job movement.

On the other end of the spectrum, alumni with MBAs or MAs in education are much *more* likely to remain in the state. Of the 70 alumni with MAs in education, only 6 have an out-of-state address. No doubt this is symptomatic of the lack of incentives that exist for Wisconsin teachers to leave the state.

31 alumni have MBAs, and of those, only 3 live outside of Wisconsin, again well below the 20% of our alumni who live in other states. Given our limited data set we can only venture a guess as to the cause for this fact, but we speculate that the returns to an MBA from a smaller, less-well-known university (like UWO, where a number of alumni received their MBA as well as their BA) are somewhat limited outside of that particular region, where employers are in a better position to gauge the value of the degree. In the elite MBA programs a large part of the value in the MBA is in the screening done by the university: if a student was admitted into Northwestern, he must be smart and competent. In the vast majority of universities with essentially open admission into MBA programs, the rigor and content of the program may be known only by those employers who have had previous employees from this institution. Therefore, most alumni who obtain MBAs may already be regionally constrained by the location they chose before pursuing the MBA.

**What other differences do we see between in-state and out-of-state alumni?**

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<sup>5</sup> The differences in proportions in Table 5 are statistically significant; the Chi-Square statistic is 32.73.

**a. Wisconsin residents have a longer tenure at their jobs.** We asked the alumni in our sample approximately how long they had been with their current primary employer. We find that Wisconsin residents have held their current jobs about 1.8 years longer than those who have left the state. The 1980 alumni still in Wisconsin have held their jobs for an average of 9.7 years, compared to 6.4 years for those who live outside of Wisconsin. For 1990 alumni, those living in Wisconsin have held their job for 7.9 years, while the average non-Wisconsin graduate has held his for an average of only 4.6 years. This is consistent with the previous data analysis that seems to indicate that the alumni who leave the state seem to be more career-oriented and more willing to make sacrifices for their job.

b. Wisconsin residents work fewer hours per week. Using regression analysis to control for other factors that might influence the hours of work, such as age and gender, we find that alumni in Wisconsin work an average of 2.5 hours less per week than alumni residing out of state. Again, this fits with our developing story that those who leave the state are more career-oriented and have a higher earning potential.

**c. Wisconsin residents have had fewer jobs.** This is consistent with the fact that alumni in Wisconsin have longer tenure at their job. Those currently residing outside of Wisconsin have held an average of 3.67 jobs, compared to 2.48 jobs for Wisconsin residents. Controlling for other factors that might influence the number of jobs that alumni might have had, 1990 alumni who have left the state have held .64 more jobs on average than their Wisconsin counterparts, while 1980 graduates who emigrated have held 1.45 more jobs than their Wisconsin classmates. Both of these differences are large enough to be called statistically significant.

**d. Family sizes are roughly the same for both groups.** Naturally, the older 1980 alumni have larger households than the more recent 1990 graduates. However, the difference between family sizes of Wisconsin residents and non-Wisconsin residents is minor, and is not statistically significant.

e. Wisconsin residents are *somewhat* more likely to not be employed or to have part-time employment. Of the 633 people who responded and told us their employment status, 16 reported not having a job, all of whom lived in the state of Wisconsin. Of the 92 people who wrote that they only worked part time, 18, or 19.5%, were out of state. We conclude that alumni remaining in Wisconsin are more likely to not have a job, but are not appreciably more likely to have part-time employment than the alumni living outside of the state.

## Conclusions

Our survey consisted of two graduating classes from the University of Wisconsin Oshkosh, and cannot be treated as a truly representative survey. Nevertheless, our results are instructive, and are more informative than other studies that look at only very recent graduates of UW system schools.

The results we feel demonstrate that the state is indeed facing a brain drain of some sort, primarily in the math/science fields most associated with high-tech employment. 18% of the graduating class of 1990 and 25% of the class of 1980 were no longer residing in Wisconsin, and those that had left had higher incomes, and were more likely to be employed in the physical sciences, math, computer science, engineering, or health professions.

We feel that this exodus of talented college graduates is cause for concern. The graduates who are leaving the state earn more money, are more likely to earn a law degree or Ph.D., and in general are more technically trained than the graduates who remain in the state. If we hope to start a computer, science, or biotech corridor in the state, these are precisely the people who are needed to make it happen.

The slow rate of income growth in Wisconsin, coupled with the exodus of talented math/science college students from the state, leads us to believe that the state's economic problem is not in creating college graduates. Instead, we believe that it is a result of the state failing to attract employers willing to hire those graduates in the state.

A state industrial policy that focuses on tax breaks for physical investment in plant and equipment -- i.e. the manufacturing sector of the state's economy -- will axiomatically treat less favorably those enterprises whose investment is primarily in human and intellectual capital. Perhaps more neutral state tax policies that finance lower overall tax rates by reducing or eliminating the special treatment afforded large manufacturing enterprises might be an appropriate first step towards keeping more of our talented college graduates at home.

## **Bibliography**

- Becker, William E and Darrell R. Lewis, editors, *The Economics of American Higher Education*, Norwell, MA, Kluwer Academic Press, 1992.
- Beggs, John L. and Bruce J. Chapman, "Labor Turnover Bias in Estimating Wages"; *The Review of Economics and Statistics*, Winter, 1988, pp 117-123.
- Cameron, A. Colin and Pravin K. Trivedi, "Econometric Models Based on Count Data: Comparisons and Applications of Some Estimators and Tests"; *Journal of Econometrics*, Winter 1986, pp 29-53.
- Gronau, Reuben, "Sex-Related Wage Differentials and Women's Interrupted Labor Careers", *Journal of Labor Economics*, Summer 1988, pp 277-301.
- Jovanovic, Boyan, "Job Matching and the Theory of Turnover", *Journal of Political Economy*, September 1979, pp 972-990.
- Maddala, G.S. *Limited Dependent and Qualitative Variables in Econometrics*, New York, Cambridge University Press, 1983.
- Sneider, Julie, "Escape From Wisconsin" Milwaukee Business Journal, 18 May 2001.
- University of Wisconsin Office of Policy Analysis and Research: "Post Baccalaureate Experiences of University of Wisconsin Graduates."
- Weiss, Andrew, "Determinants of Quit Behavior", *Journal of Labor Economics*, Spring 1984, pp 371-387.