Special Report:
Brain Drain in Wisconsin
By: Carrie Zhang, Assistant Professor of Economics at UW-Stevens Point
The Stevens Point Economic Indicator Report is made possible by a generous grant from BMO Harris Bank.
Background
The Central Wisconsin Economic Research Bureau (CWERB) at the University of Wisconsin-Stevens Point (UWSP) conducted a study on the exporting activities in Adams, Lincoln, Marathon, Portage and Wood counties. This geographic area will be referred to as North Central Wisconsin. Funding for the study came from Centergy Inc., through the Wisconsin Economic Development Corporation. Additional funding for the CWERB comes from BMO Harris Bank of Stevens Point, Wisconsin.

The purpose of the research was to ascertain the level of exporting activity in North Central Wisconsin and to determine the barriers that are preventing local firms from exporting to other countries. First, an internet based survey was used to collect data. This survey was modeled after the one used by the Brookings Institution Metropolitan Policy Program and the Minnesota Trade Office (MTO) to survey the Minneapolis-Saint Paul Metro Area. Second, detailed industry data were generated from the Brookings Institution’s Export Nation 2012 database. The resulting statistics provide additional insight into exporting activity within our region.

Executive Summary
The major conclusions drawn from the survey of the exporting activity of business firms located in North Central Wisconsin are as follows.

The low participation rate of firms in North Central Wisconsin was comparable to that found in the Minnesota Trade Office (MTO) study of Minneapolis-Saint Paul region’s non-urban counties. The degree of firm interest in exporting activity in North Central Wisconsin is a function of the small size of the typical firm found in the region and a function of the types of businesses found in a rural economy. The region is mostly rural and has no major metropolitan area like Minneapolis-Saint Paul and therefore, it is not surprising that the degree of participation in the CWERB study would most closely resemble that of the non-urban part of the MTO project.

Business firms in our region tend to be small and, in the words of a survey participant, are “oriented to meeting local demand.” The Small Business Administration states in its Wisconsin Small Business Profile, February 2013, “most Wisconsin Businesses are very small, as 75 percent of all businesses have no employees and most employers have fewer than 20 employees.”

This does not mean that there are no firms that export in the region. The survey results and the exporting statistics presented in the report indicate that this is not a fair characterization of the situation. What it does mean, is that the concentration of firms having an interest in exporting to a foreign destination is relatively low when compared to export participation at the national level.

The firms who did respond to the survey want government programs to help them increase exporting activity. The types of assistance are detailed in the report. However, the low concentration of such firms brings into question the strategy of offering export assistance programs to the general business community. In other words, providers and facilitators of export services may be more successful if they identify the specific firms that are interested in exporting and then, tailor their exporting assistance programs to the needs of those firms.

The detailed export activity statistics provided in this report give good indication as to which industry classifications are most likely to contain firms interested in exporting. While it is beyond the scope of the export study, the data contained in this report creates a foundation for the identification of those firms that could potentially benefit from export assistance programs.

Major exporting sectors in the region in 2010 include: Machinery at $350 million (981 direct export jobs), Paper at $253 million (562 jobs), Agriculture Products at $125 million (554 jobs), Business Services at $112 million (455), Transportation Equipment at $105 million (174 jobs), and Food at $98 million (146 jobs). There were an estimated 5,906 direct export jobs in the region in 2010. From the U.S. Bureau of Labor Statics (BLS), there were 153,206 nonfarm jobs in north central Wisconsin in 2010, and thus the percentage of regional jobs directly tied to exporting was 3.8%. This was only slightly less than Wisconsin’s mark of 3.9%. Each county in the region (Adams, Lincoln, Marathon, Portage, and Wood) has a unique economy and exporting structure. The details are presented in the report. Marathon has the largest percentage of its total employment engaged in exporting activity (4.3%) and Wood the smallest percentage (3.2%).

Lastly, some of the most prominent exporting sectors in the five counties have experienced low annualized growth rates in exporting activity over the 2003-2010
time period. For example, the paper industry which is very important in terms of exporting activity has experienced low growth and faces stiff international competition. This situation creates a special challenge for organizations wanting to increase exporting activity in the region. In contrast, over the same time period, the machinery sector has experienced strong growth in the counties and has much promise in terms of future exporting activity.

Copies of the full report can be obtained by contacting the CWERB at the University of Wisconsin-Stevens Point Stevens Point, WI 54481, cwerb@uwsp.edu or 715-346-3774.

National economic statistics for first quarter 2014 are presented below in Table 1.

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>NATIONAL ECONOMIC STATISTICS</th>
<th>2013</th>
<th>2014</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Domestic Product (Billions)</td>
<td>$15,535.6</td>
<td>$17,149.0</td>
<td>+3.7</td>
<td></td>
</tr>
<tr>
<td>Real Gross Domestic Product (Billions of 2009 $)</td>
<td>$15,583.9</td>
<td>$15,946.5</td>
<td>+2.3</td>
<td></td>
</tr>
<tr>
<td>Industrial Production (2002 = 100)</td>
<td>90.5</td>
<td>103.2</td>
<td>+12.7</td>
<td></td>
</tr>
<tr>
<td>Three Month U.S. Treasury Bill Rate</td>
<td>0.08%</td>
<td>0.05%</td>
<td>-0.05%</td>
<td></td>
</tr>
</tbody>
</table>

Central Wisconsin

The unemployment rate in each reporting areas is displayed in Table 2. In March 2014 Marathon, Portage and Wood County all experienced a decline in their unemployment rates’ from a year ago. The respective March rates for Portage, Marathon and Wood were 6.7, 6.6 and 7.3 percent. The labor force weighted unemployment rate for Central Wisconsin was unchanged, was at 6.8 percent. Meanwhile Wisconsin’s unemployment rate dropped from 7.6 to 6.7 percent. Thus, the unemployment rates were much improved throughout the region and state. The United States unemployment rate fell from 7.6 percent to 6.8 percent.

Employment figures in Table 3 are based on the government’s survey of households. Portage County’s total employment figure expanded by 0.3 percent points and total employment in Wood County rose by 0.4 percent over the past year. Marathon County payrolls grew by a faster pace, 3.0 percent over the past twelve months. Central Wisconsin as a whole experienced an employment increase of about 2,200 positions. Jobs in the region expanded from 141.9 to 144.1 thousand or by 1.6 percent. The survey of households also shows that Wisconsin’s payrolls increased by 1.7 percent, or by about 49,000 positions over the period. The nation gained 2.0 percent or about 2,790,000 jobs over the same period.

Table 4 gives the most recent employer based payrolls numbers for Wisconsin. Economists believe the nonfarm employment numbers based on employer provided data, give a more accurate assessment of the labor market conditions than does the household survey data. From March 2013 to August 2014 Wisconsin’s total nonfarm employment expanded from 2.77 million to 2.80 million or by a 1.0 percent. This represents a gain of approximately 26,000 thousand jobs during the past year. Just like six months ago the sectors of the economy to experience job growth were natural resources and mining, construction, manufacturing, trade transportation and utilities, professional & business services, leisure & hospitality, educational & health services and government. However, the employment results for information, and financial activities were
disappointing. Thus, the rate of job generation in the state continues to be very modest as measured by this data set.

In Table 5, Portage County sales tax distributions were flat contracting slightly from $1,295.4 thousand to $1,294.8 thousand, a decrease close to 0 percent. Marathon experienced an increase in sales tax distributions from the state. Marathon rose from $2,590.7 thousand to $2,635.6 thousand or by 1.7 percent. Similarly Wood County collections also expanded from $1,183.3 to $1,218.7 or by about 3 percent over the course of the past year. Despite the brutal winter weather, the data suggests there was some improvement in retail activity in Central Wisconsin.

The CWERB’s survey of area business executives is reported in Table 6. This group believes that recent events at the national level have led to a very slight improvement in the country’s economic condition. In addition and more importantly, they believe the local business climate has improved over the past twelve months. When asked to forecast economic conditions at the national level, they were a lot more optimistic about the future direction of the economy than in the recent past. They also expressed similar optimism for the local economy for their particular industry. Overall, Table 6 also shows that the level of optimism expressed for the economy was generally higher in March 2014 than in September 2013.

Figures 1 thru 7 give a historic overview of how the economy in Wisconsin has performed during the 2008-2014 time period. For example, Figure 5 shows a dramatic decline in Wisconsin manufacturing and the gradual rebound taking place since 2010. In 2009 about 470,000 were employed in manufacturing and at a end of 2010, the number of jobs bottomed out at approximately 425,000. Since that time the rebound in activity has added about 45,000 positions to the manufacturing sector. Figure 7 shows the steep rebound in the number of people employed in leisure & hospitality, from about 265,000 in 2009 to 263,000 in the early part of 2014.

**Figure 1: Employment Level: WI**

![Figure 1: Employment Level: Wisconsin](image)

**Figure 2: Unemployment Level: WI**

![Figure 2: Unemployment Level: Wisconsin](image)

**Figure 3: Unemployment Rate: WI**

![Figure 3: Unemployment Rate: Wisconsin](image)
We usually include Table 7 which gives employer based estimates of industrial sector employment in Portage County. However, please note at the time the report was written these data for March were not available from the Wisconsin Department of Workforce Development. Hopefully these data will be available on a timely basis in the future and will be included in the report.

In Table 8 the CWERB’s retailer confidence survey finds that merchants feel that store sales were slightly higher than they were one year ago. This is welcome news for the local economy. When it comes to expectations about the future, it appears that the March 2014 assessment of retail activity was marginally higher than it was in September 2013. Also this group feels that retail activity in the summer of 2014 will be at higher than it was 2013. The overall significance of the survey is that local merchants are saying that there are some signs improvements taking place in the local retail sector.

Table 9 Help Wanted Advertising is a barometer of local labor market conditions and the indexes for Stevens Point, Wausau, Marshfield and Wisconsin Rapids are now based on job advertising on the internet. The index for Stevens Point and Wisconsin Rapids rose by 27.9 percent and by 21.5 percent respectively when compared to a year ago. Further, Wausau experienced a large expansion in the amount advertising taking place, about 47 percent. Marshfield’s help wanted index also rose by approximately 19 percent. These data suggests that
advertising growth has been growing in the area and should lead to improvement in the job market numbers.

We have a new Table 10 for this report. Table 10 presents detailed exporting activity for Portage County. Major exporting sectors in 2010 include: Paper at $38.0 million (72 direct export jobs), Machinery at $37.6 million (108 jobs), Food at $33.2 million (54 jobs), Agricultural Products at $26.3 million (117 jobs), Insurance Services at $24.0 million (102 jobs), and Business Services at $20.2 million (103 jobs).

Table 10 also shows industry real export annual growth rates from 2003-2010; the estimated number of direct export jobs by industry in Portage County, and, by industry, the direct export jobs annualized growth rates from 2003-2010. The Portage County industry with the largest number of direct export jobs was Travel and Tourism with 128 jobs.

From the table, there is was estimated 1,187 direct export jobs in Marathon County. From the U.S. Bureau of Labor Statistics (BLS), there were 31,695 total nonfarm jobs in in the county in 2010, and thus the percentage of jobs directly tied to exporting was estimated to be 3.8 percent.

Data for Table 11 was not available before the report went to press.

Another measure of the local economy is presented in Table 12. It shows that new unemployment claims contracted from 188 to 162 or by 13.8 percent over the year. Moreover total unemployment claims dropped from 1,742 to 1,503 or by 13.7 percent in our year over comparison. This signals that the local economy is gaining strength.

Table 13 presents the residential construction numbers for the Stevens Point-Plover area. In our yearly comparison the number of permits issued in First Quarter was 8, the same as last year. The 2014 construction had an estimated value of $887 thousand and represents 7 housing units. When comparing First Quarter 2013 to that of 2014 residential alteration activity contracted from 61 to 50 permits. Further, the estimated value of this type of activity went down from $424.6 thousand to $379.6 thousand. Overall, the 2014 construction data is off the pace of a year ago. The historically bad weather of 2014 surely played a role in suppressing the amount residential construction activity.

The nonresidential construction figures in Table 14 were as follows for First Quarter 2014. The number of permits issued was just 1 and its estimated value was $53.7 thousand. The number of business alteration
permits was 35 in 2014 compared to 56 in 2013. The estimated value of alteration activity was $1.062 million 2014 compared to the 2013 figure of $3.472 million. In sum, the pace nonresidential construction activity fell in the area. Once again the winter weather of 2014 most likely had a strong influence on the numbers.

| TABLE 14 | NONRESIDENTIAL CONSTRUCTION \n| STEVENS POINT - PLOVER AREA | \n| | 2013 First Quarter | 2014 First Quarter |
| Number of Permits Issued | 8 | 1 |
| Estimated Value of New Structures (thousands) | $1,418.0 | $53.7 |
| Number of Business Alteration Permits | 56 | 35 |
| Estimated Value of Business Alterations (thousands) | $3,471.6 | $1,062.5 |


Figures 8 thru 11 give an economic history lesson as to how the employment level, the unemployment level, the unemployment rate, and the labor force have trended over the past five years in Portage County. Please note the data for the charts runs from January 2009 to early 2014. The figures clearly show the influence of the great recession on the area local economy and the figures supplement the report’s year over year comparisons. This allows the short-term fluctuations in the economy to be judged more properly.

**Housing Market Information**

The following seven tables contain information on the national, regional, and local housing market. Housing activity is an incredibly important aspect of the economy. We believe the reader will gain valuable insight into housing markets conditions and greater insight into the local economy in this section of the report.

Table 15 gives national median home price for the U.S. and major regions in the U.S. The median home price in the U.S. rose to $198,500 in March 2014. Housing prices in the Midwest remain the lowest in the nation. The median home price in our part of the country has rose from $154,600 in 2013 to an estimated $179,600 in March 2014. In general housing prices are rising in
all of the U.S.’s geographic regions. The West has the highest medium housing prices at $289,300.

Table 16 National and the Midwest existing home sales data shows a noticeable decline in sales activity over the past year. In the Midwest 1,040,000 homes are forecasted to be sold in 2014. For the Midwest, the preliminary estimate for 2014 is that 160,000 fewer homes will be sold than in 2013. In 2013 the number of home sold in the Midwest bottomed out at 910,000 units.

Table 16 National Median Home Prices

<table>
<thead>
<tr>
<th>Year</th>
<th>U.S.</th>
<th>Northeast</th>
<th>Midwest</th>
<th>South</th>
<th>West</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>$172,500</td>
<td>$249,500</td>
<td>$144,100</td>
<td>$113,000</td>
<td>$211,100</td>
</tr>
<tr>
<td>2010</td>
<td>$173,000</td>
<td>$243,500</td>
<td>$141,600</td>
<td>$110,000</td>
<td>$215,100</td>
</tr>
<tr>
<td>2011</td>
<td>$198,100</td>
<td>$237,000</td>
<td>$139,400</td>
<td>$144,200</td>
<td>$210,300</td>
</tr>
<tr>
<td>2012</td>
<td>$176,800</td>
<td>$243,100</td>
<td>$142,500</td>
<td>$150,700</td>
<td>$230,100</td>
</tr>
<tr>
<td>2013</td>
<td>$197,100</td>
<td>$241,100</td>
<td>$154,000</td>
<td>$170,500</td>
<td>$273,000</td>
</tr>
<tr>
<td>March 2014</td>
<td>$198,500</td>
<td>$244,700</td>
<td>$179,500</td>
<td>$189,000</td>
<td>$289,300</td>
</tr>
</tbody>
</table>

Table 18 presents the national affordability index. Over the years very low interest rates and falling home prices have greatly improved the affordability of homes. However, in 2013 housing prices and interest rates trended upwards. While still outstanding, the preliminary estimate for the affordability index in 2013 is 175.8, down from 196.5 in 2012. The lower the index, the less affordable housing is for the typical family. This means in 2013, a household earning the median income has 175 percent of the income necessary to qualify for a conventional loan covering 80 percent of a medium-priced existing single-family home.

Table 19 displays data on state and local area median prices. For the most part Wisconsin and local area home prices have been more stable than the U.S. as a whole. In Central Wisconsin the lowest median home price is in Wood County at $83,000. Portage County has the highest median price of $127,500 and Marathon falls somewhere between other the two counties, with a median home price of $115,000. The median price of a house in Wisconsin is about $132,500. In addition, after a few years of rising values, the preliminary data for 2014 suggests that the median prices in the local area and state are declining.
Table 20 gives the number of local housing units sold, from 2011 to 2014. The counties of the region have all experienced increases in the number of units sold over this time period. Please note the listed number of homes sold in 2014 only represents the January to March activity level.

<table>
<thead>
<tr>
<th>TABLE 20</th>
<th>WISCONSIN</th>
<th>MARATHON</th>
<th>PORTAGE</th>
<th>WOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCAL UNITS SOLD</td>
<td>2011</td>
<td>2012</td>
<td>2013</td>
<td>2014r</td>
</tr>
<tr>
<td>2011</td>
<td>51,858</td>
<td>62,706</td>
<td>66,702</td>
<td>13,877</td>
</tr>
<tr>
<td>2012</td>
<td>1,060</td>
<td>1,252</td>
<td>1,423</td>
<td>300</td>
</tr>
<tr>
<td>2013</td>
<td>448</td>
<td>557</td>
<td>818</td>
<td>120</td>
</tr>
<tr>
<td>2014r</td>
<td>571</td>
<td>671</td>
<td>728</td>
<td>137</td>
</tr>
</tbody>
</table>

Tables 21 and 22 present the changes that have taken place in local median prices and units sold, comparing First Quarter 2013 to First Quarter 2014. Here we see a decrease in local median home prices has taken place. The number of housing units sold in Marathon County and Portage County increased by 5.5 and 10.3 percent respectively. The lone exception being the 0 percent change in units sold in Wood County.

<table>
<thead>
<tr>
<th>TABLE 21</th>
<th>MARATHON</th>
<th>PORTAGE</th>
<th>WOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCAL MEDIAN PRICE</td>
<td>2013</td>
<td>2014</td>
<td></td>
</tr>
<tr>
<td>First Quarter 2013</td>
<td>117,000</td>
<td>151,000</td>
<td>95,750</td>
</tr>
<tr>
<td>First Quarter 2014</td>
<td>116,500</td>
<td>145,000</td>
<td>86,500</td>
</tr>
<tr>
<td>Percent Change</td>
<td>-0.4%</td>
<td>-4.0%</td>
<td>-9.7%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TABLE 22</th>
<th>MARATHON</th>
<th>PORTAGE</th>
<th>WOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER OF HOME SALES</td>
<td>2013</td>
<td>2014</td>
<td></td>
</tr>
<tr>
<td>First Quarter 2013</td>
<td>110</td>
<td>39</td>
<td>54</td>
</tr>
<tr>
<td>First Quarter 2014</td>
<td>116</td>
<td>43</td>
<td>54</td>
</tr>
<tr>
<td>Percent Change</td>
<td>5.5%</td>
<td>10.3%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>
A Look at Business Starts Employee Size and the Shifting Economy

UWSP Small Business Development Center
Vicki Lobermeier, SBDC Director of Entrepreneurship Activities
Mary Wescott, SBDC Counseling Manager

From 2004-2012, the number of Wisconsin small businesses with between two and nine employees soared 72%, according to UW Extension’s Mark Lange. In a March 19 Newsmakers interview on Wisconsin Eye, Lange, Executive Director - UW Extension Division of Entrepreneurship and Economic Development spoke of the shift in our economy. The entire interview is available at www.wiseye.org/Programming/VideoArchive/EventDetail.aspx?evhdid=8621

Lange addresses the shift in our economy nationwide 2000 to 2010, showing the average number of jobs per business establishment went from 11.0 to 7.4 employees. Jobs, as the metric of business activity may be changing, Lange said in the broadcast interview. The average number of jobs per business startups fell from 4.7 to 2 per startup during the same period. The number of employees per large publicly owned company also decreased from an average of 4969 per company to 3226 employees per company. The total number of employees per big company declined during the decade, as did the total number employed by large companies. While early in the decade, 25M worked for large public companies, that number dropped to 20M by the end of 2010. Due in part to what has been termed, ‘forced self-employment’, the total number of startups grew rapidly from 11.3 to 19.7M during the same period. These national numbers show 2000 to 2010 was a decade of structural shift for our economy.

Lange shares the data developed by a Harvard economist who tracked data by DUNS numbers. Statistics by DUNS number are available at www.youreconomy.org/ The site categorizes businesses by size of employee, or business stage. The site shows data by company size defined as self-employed, stage 1 with 2-9 employees, stage 2 with 10-99, stage 3 with 100-499 and stage 4 companies over 500 employees. WI data 2004 to 2012 shows the largest increase in job growth went on in stage 1 companies, those with 2-9 employees. Stage 2 companies, those sized 10-99 showed zero growth during the same time 2004 to 2012.

Recent reports from the Kauffman Foundation tell us that nationwide the total number of new businesses declined in 2013, as the unemployment rate went down. This might indicate a slowing of ‘forced self-employment’ as jobs become available. The report states the 2013 business creation rate has returned to levels found prior to the recession. As reported in the Milwaukee Journal Sentinel, Wisconsin saw a decline in entrepreneurial activity with 170 businesses created for every 100,000 adults. More on the 2014 Kauffman Index of Entrepreneurial Activity is online at www.kauffman.org/-/media/kauffman_org/research%20reports%20and%20covers/2014/04/kiea_2014_report.pdf.

The UWSP Small Business Development Center 715-346-3838 is happy to help area businesses find additional resources.
Total SBA Loan Amount Compared Q1

Total Business Starts Compared

Total Number of SBA Loans Compared Q1
Introduction
A 2010 poll conducted by UW-Madison Professor Ken Foldstein found that 62 percent of Wisconsinites agreed with the statement that Wisconsin’s brightest college graduates are leaving their home state for opportunities outside Wisconsin, and that “brain drain” is a statewide concern. Additionally, a speaker at the governor’s conference on economic development in February pointed out that combatting “brain drain” is the key to Wisconsin’s growth, with neighboring states like Illinois and Minnesota gaining college graduates. These inquiries raise several questions. Is “brain drain” a problem for Wisconsin? If so, what are the causes? How serious is the problem?

So exactly what is “brain drain”? In economics, “brain drain” is defined as a situation in which educated or professional people leave a particular place for one that gives them better pay or living conditions. More generally, brain drain is also called human capital flight, with human capital being the knowledge, skills, competencies, and attributes of individuals that facilitate the creation of personal, social and economic well-being. Differences in human capital among workers can be explained by various worker attributes, such as education, health conditions, experience, and training. Improving individual human capital can help alleviate the severity of social inequality in a society. Moreover, human capital has been shown to exhibit positive externalities because well-trained individuals tend to spread their knowledge to others, thus benefitting less skilled individuals (Lucas, 1988). In sum, human capital is a driving force for the growth of the economy (Barro and Sala-i-Martin 2004).

Any loss of human capital from the exit of skilled workers will lead to lower education levels, lower per capita income and fewer opportunities for economic development. Brain drain is a comprehensive term that encompasses the emigration of all highly trained or educated people of all age groups, not only the out-migration of young (aged 25-29), single, and college educated. Brain drain will be worse if human capital flight is associated with the net loss of young college-educated individuals because of the negative impact of lost tax revenues and diminished economic prospects. Without a skilled and highly educated workforce, our economy will experience slower growth, because of lost productivity. Studies have shown that more “qualified job applicants” mean more jobs because companies tend to move to states where they know they can hire an educated workforce.

The loss of human capital from brain drain is usually regarded as an economic cost. Investment in education by local governments may not lead to faster local economic growth if a large number of its highly educated workers leave the home state. “Brain drain” thus often leads to arguments that question the effectiveness of public investments in education. Though Wisconsin’s population is increasing, most of the growth is occurring in people 65 or older. Over the past five years, Wisconsin has lost 9,000 college educated residents, aged between 21 and 29. This, however, has been the experience of every state. For highly educated young people, the whole world is their job market. This is not so much brain drain, but brain redistribution. Mobility in our society has increased because of new technologies. Similar to the importance of human capital, mobility is also the key factor in the success of the local economy. The influence of migration can be treated as an equilibrating mechanism in change economy (Sjaastad, 1962). Economists have shown that migration is a method of promoting better resource allocation. We could treat migration as an investment in increasing the productivity of human resource, and thus, a very important factor for the growth of the local economy. While we pay close attention to the number of people leaving the state, we should not ignore the number of people coming to Wisconsin, and the quality of human capital carried by in-migrants.
Since “brain drain” involves the loss of human capital, if we really want to check the severity of the brain drain in Wisconsin, we should not simply count the number of migrants, (the number of the inflow and the number of the outflow). We should also carefully examine the human capital of migrants both leaving and arriving in Wisconsin, to assess changes in labor productivity of the state. A relatively higher rate of in-migration of talented people and a relatively lower rate of out-migration of talent overtime can increase the level of human capital in the local economy. So we need to consider ways to measure the quantity of human capital carried by migrants.

Such measurements and data sources are described in the second section. The third section gives the results of our study. A comparison of brain drain among the quantity of human capital carried by migrants. Such measurements and data sources are described in detail below. The third section gives the results of our study. A comparison of brain drain among the quantity of human capital carried by migrants. Such measurements and data sources are described in detail below.

Policy implications and conclusions are discussed in regional and neighboring states will also be explored.

Method and Data
There is no a perfect way to identify exactly how much human capital each person possesses because each person is different. We adopt a general measurement that takes into consideration shared characteristics that influence human capital stocks, including education attainment, work experience, health status, marital status, and other variables.

Basic Model
Persons with greater human capital are more productive than those with less human capital. As the amount of time a person spends in an activity grows, that person is likely to develop some method, either a new technique or simply muscle memory, to increase proficiency, thereby increasing output and income. Hence, the amount of human capital within a state is crucial to its competitiveness and gross state product. This begs the question: What exactly contributes to human capital development? Certainly there are formal measurements such as education and experience. However, other attributes also contribute to the formation and accumulation of human capital in any given trade. As economist Alfred Marshall put it, this happens as if “it were in the air, and [people] may learn them unconsciously” (Marshall, 1890).

To estimate the movement of human capital stocks, we adopt a method known as the “Labor-Income-Based measure of Human Capital” (LIBHC). Economist Jacob Mincer formulated the LIBHC to determine how much income an individual may command relative to the amount of their human capital. The following equation shows that income is equal to the contributions of various characteristics of an individual:

\[
\text{Lnhourlywage} = \beta_0 + \beta_1 \text{Edu} + \beta_2 \text{Exp} + \beta_3 \text{Sex} + \beta_4 \text{Race} + \beta_5 \text{Mar} + \beta_6 \text{Union} + \beta_7 \text{Dis} + \epsilon.
\]

In the equation, \(\text{Lnhourlywage}\) is the natural logarithm of an individual’s hourly wage. Edu is the level of education attainment. Studies have shown that higher education level, would dramatically boost the probability of finding a job as well as the probability of finding a better job, and thus increase earning levels. Exp refers to work experience, which constitutes another key component of human capital. Work experience permits an individual to become more productive and therefore earn a higher income. Mar is a dummy variable for marital status that helps to explain the power of family obligations, which in general, can motivate people to take on extra responsibilities at work and gain extra experience that translate into greater human capital. Further, Sex is another dummy variable used for gender, as there are gender specific jobs that restrict labor participation of certain group and thus affects the ability to accumulate human capital. In addition, we also control for other factors that may affect individual’s human capital. Race is a dummy variable for ethnicity, Dis refers to the disability status and Union represents the union affiliation. \(\epsilon\) is the error term. All these factors can distort the link between human capital and the wage rate. The intercept term, \(\beta_0\), shows the extent to which hourly wages resulted from the characteristics of their local economy, such as the amount of machinery and equipment per worker, the amount of roads or other public capital per worker. Other coefficients \((\beta_1 - \beta_7)\) show the influence of human capital characteristics on hourly wages of individuals.

With the above equations, we can take a close look at the brain drain problem in Wisconsin. We can consider how much human capital on average each out-migrant removes from a state by relocating, resulting in the “brain drain” effect or human capital flight. Alternatively, “brain gain” is the result of the inflow of persons to the state with human capital. The data sources are described in detail below.

Data Sources
The U.S. Census Bureau sends a monthly survey to households called the American Community Survey (ACS) to estimate characteristics of the U.S. population and households based on the twelve months leading up to the issue of the survey.
Individual responses are weighted to indicate the amount of people each respondent represents. The Mincer equation used in our study looks at ACS data to determine the hourly rate or return on human capital of in-migrants and out-migrants. This information is used to calculate the human capital transferred when migrants leave one state for another. We define the net flow of workers as the difference between outflow of migrants and inflow of migrants. And similarly, the net flow of human capital is the difference between total human capital stocks carried by the out-flow of workers and the human capital carried by the in-flow of workers.

As mentioned previously, education attainment is the most important variable influencing the human capital. The ACS samples span from no years of schooling to 20 years (the presumed amount of time from first grade to attainment of a doctorate degree). Work experience constitutes another key component of individual’s human capital stock. More years of work experience permit an individual to be more productive than the average greenhorn, and therefore earn a higher income. In our analysis, we utilize age as a proxy for “potential experience” because the ACS survey does not directly ask respondents about their years of work. Experience should rise with the age of workers who remain in the workforce. The link between potential experience and actual experience may be more tenuous for women than for men because women are more likely to spend time out of the formal labor force to attend to family responsibilities. We therefore control for gender in our equation.

Familial obligations may motivate an individual to want to out-perform peers and, thereby contribute to an individual’s human capital accumulation. Health problems can reduce the human capital for workers if illness causes workers to miss work for extended periods or if it leads to a loss of coordination or knowledge. We therefore include a variable for disability status in our estimation. Finally, we know that unions protect workers from unfair labor practices and create job security. While comforting for the worker, unions create disincentives to seek better opportunities elsewhere, thereby constraining human capital accumulation. The ACS survey however has not collected union affiliation data. In response, we developed a variable to estimate the probability of union affiliation for each migrant. To be considered a union member, an individual must be over 18 years of age, currently working, and earn a weekly wage within $150 of the average wage of union members of the industry.

Given our emphasis on the comprehensiveness of “brain drain”, we limited our sample to working migrants between the age of 16 and 70 who have relocated within the past year and have resided in their new states more than three months. Those without wage earnings are not taken into consideration. Hourly wages were converted to annual income assuming a 2,000 hour work year, and annual incomes are assumed to persist in the future. Future returns are then used to estimate the migrant’s human capital stock, using 10% annual discount rate.

Results
Brain Drain in Wisconsin

Let’s see if our state has a brain drain problem. Figure 1 shows flow patterns of migrants. We know from 2000 to 2010, 64,334 workers left Wisconsin per year on average and the average inflow of workers per year was 64,793. For that 11 years period, 5,040 more workers entered Wisconsin than left the state. However, Wisconsin has experienced a net loss of 40,726 workers from 2006 to 2010. This trend, if continued, will have a negative effect on Wisconsin’s future economic growth. States that have more workers enter than leave will be in a much better labor market position than states that face a net outflow of workers.

Figure 1- Flow Patterns of Migrants in Wisconsin

In order to assess the seriousness of brain drain, we need to evaluate the human capital flow patterns for Wisconsin. As shown in Figure 2, the total net loss of human capital to Wisconsin from 2000 to 2010 was about $309,137,167, despite the net gain of 5,040 workers during the same period. This tells us that the workers leaving Wisconsin were significantly more skilled and educated than the workers coming in. Although 5,040 more workers entered Wisconsin than
left, there was a net loss in human capital. Wisconsin’s GDP grew each year from 2000 to 2010 (even during the recession in 2008), so the net loss of human capital is not preventing Wisconsin from growing. It may however be preventing Wisconsin from growing at a faster rate. Figure 2 shows that, since 2010, Wisconsin has experienced an increase in net human capital inflow at $2,768,479,479, despite 17,779 more workers leaving Wisconsin than entering the state in 2010. This change may indicate that Wisconsin has had some success in attracting the highly skilled and educated workers. We need to continue this trend line to promote our economic growth, especially growth into the future.

**Figure 2- Flow Patterns of Wisconsin Human Capital**

Wisconsin and its Neighbor States

In order to have a better understanding of our brain drain problem, we also need to examine the experience of surrounding states. Figures 3 and 4 show how net flows of migrants and human capital in Wisconsin compare to its neighbor states. Of the 4 states surrounding Wisconsin, we can clearly see that most of our neighbors lost workers from 2000 to 2010, except for Iowa which gained more workers than it lost. Iowa far exceeded Wisconsin’s total net gain in workers, while the other 3 states experienced net losses. The net inflow of workers to Iowa during the period is 11,087, while Illinois’s net loss was 381,262 workers, Michigan’s net loss was 284,648, and Minnesota’s net loss was 45,190. It is surprising that Illinois lost workers given that Chicago has been a magnet for workers in the past.

It is also necessary to check the flow pattern of human capital carried by these migrants in our bordering states. In Figure 4, we see that most of our neighbor states lost human capital from 2000 to 2010, except Illinois which gained over $100 billion in income from the net inflow of by highly skilled and educated workers. This result is consistent with the expectations of economists. Larger and more interesting cities are especially attractive for the highly skilled and educated workers who prefer communities that have the amenities they desire, such as education and job opportunities. The only neighbor state that really enjoyed “brain gain” is Illinois. The proximity of Chicago is also one reason why Wisconsin loses many of its young and highly educated workers.

Relatively speaking, Wisconsin’s brain problem may not be as dire as initially thought. While Wisconsin lost $309,137,167 in income in the 11 year period, Iowa lost $10,132,194,003, Michigan $41,692,937,461, and Minnesota $22,286,727,435. Wisconsin has managed to recover the lost human capital since 2010 with a
surge in highly skilled and educated in-migration of workers, despite the U.S. trend of human capital moving south. Compared with Minnesota, Iowa and Michigan, Wisconsin has been a magnet for highly skilled and educated workers. Among all our neighbors, Iowa is most like Wisconsin. Though Iowa performed better than Wisconsin in attracting workers overall, the state lost more human capital than Wisconsin because it was losing educated and skilled workers while attracting unskilled workers during the period.

The other 2 states – Michigan and Minnesota, experienced a net loss both in the number of workers and the level of human capital. Despite the long term economic stagnation in Michigan, it seems that Minnesota has more problems in attracting people, especially skilled and educated workers. Minnesota has a higher GSP level, larger metropolitan areas, and much higher per capita income than Wisconsin. Why then has Wisconsin performed better in terms of net migration and human capital? Some clues to this come from the data collected by the National Center for Education Statistics. Wisconsin is an annual net importer of college-bound students due to the good reputation of college and universities in Wisconsin, while Minnesota and Michigan are annual net exporter of young high school graduates. Tornatzky, et.al. (2001) found that college reputation was the most important factor determining choices of high school graduates, and students in general tended to stay where they earned college degrees. Their findings are supported by a report from the University of Wisconsin System, which looked at the number of graduates who remain in the state. Of all 13 four-year institutions, 81 percent of Wisconsin residents remained in the state after graduation from a UW System institution. Overall – including non-residents- 67% of alumni remained in Wisconsin. At UW- Madison, 69% of Wisconsin residents stayed in the state. At UW- Stevens Point, 76% of UW-Stevens Point graduates remained in the state, with 31% living in the North Central region. In total, 81% of Wisconsin residents who graduated from UW-Stevens Point remained in the state.

If a state loses high school graduates who obtain a college degree in another state, it will result in fewer individuals contributing to the home state’s future economy. These facts go against the argument that “brain drain” phenomenon should discourage investment in education. Our better university and community college system actually curbs brain drain. States that attract more college enrollees from other states than they lose will be in a much better economic position in the future. Instead of investing less in the education in Wisconsin, we should invest more here to attract more educated and young people.

Brain Drains in Great Lakes and Midwest Region
Regional comparisons of domestic migrations are illustrated in Figure 5 which shows the net regional flow patterns of workers in average in the Great Lakes and Midwest from 2000 to 2010. When we do the all the regional comparisons of domestic migrations for the whole United States from 2005 to 2010, the biggest loser of workers is the Great Lakes regions, while the greatest gains go to states in the Southeast region. We know that many workers leave the northern part of the country for southern states, so it is not surprising to see that the Midwest experienced a net loss of workers. The situation is even worse in the Great lakes region. We can also observe from Figure 5, there is more in-migration before the financial crisis in 2008 than afterwards, supporting the idea that people are

Figure 5 - Net Flows of Migrants in the Great Lakes and Midwest Region
more mobile when they have money. With regards to the net flow of human capital in the two regions shown in Figure 6, we can see that the whole Midwest area lost human capital at a $201,193,186 on average every year from 2001 to 2010, while the Great Lakes gained $701,769,370. The Great Lakes is doing better in attracting skilled and educated workers than the rest of the states in the Midwest. Despite this, we should not ignore the problem of a consistent net loss of the human capital since 2003 for the Great Lakes region.

Figure 6 - Net Flows of Human Capitals in the Great Lakes and Midwest Region

Policy Implications and Conclusion
A lack of qualified workers undermine economic stability and growth in the future so policy and business leaders need to have a clearer picture of our flow pattern of workers, and human capital especially. We have shown that Wisconsin experienced a net in-migration of workers and brain drain during the period of 2000 to 2010. The real problem is that the skill level of out-migrants is higher than in-migrants. Several factors have contributed to the net loss of human capitals in our state. Wisconsin has a lower per capita income level than other states-$37,623 compared to $39,626 nationally. Good paying jobs and career opportunities are the most important criteria to migrants in choosing where to live. Another significant factor contributing to Wisconsin’s brain drain is the national trend toward urban areas which typically have more job opportunities and higher wages. Though we have a major metropolis in Milwaukee, larger cities like Chicago and Minneapolis can attract a lot of Wisconsin’s educated and skilled workers. It is very important for workers, especially for the skilled and educated young people to find a place that is “active, exciting and fun” (Thomas B. Fordham Institute, 2009).

Contrary to conventional wisdom, the so-called “brain drain” may not be as dire as is often portrayed in Wisconsin. Compared with Minnesota, Iowa and Michigan, Wisconsin is a more attractive place for educated and skilled workers. Wisconsin did manage to recover much of the lost human capital in 2010 with a huge surge in highly skilled in-migration of workers. We find that our well-regarded university and community college system has attracted out-of-state school graduates, many who stay in Wisconsin after earning their college degree.

Long-range comprehensive initiatives should be developed to try to combat the drain in human capital. First of all, we need to create jobs that pay competitive wages. Other researchers have emphasized the need to implement policies, such as tax credits, to promote growth in industries with “technological intensity”, which tend to grow faster, create more jobs, and lead to higher incomes. Like other states in the Midwest, Wisconsin’s traditional manufacturing industries have not been able to compete with the high-tech industries in Silicon Valley and Chicago for highly skilled workers. Increasing the share of Wisconsin firms with technological intensity will help combat brain drain, making our state more attractive for the future.
workers. Boosting Wisconsin’s economy will take more than just adding jobs and attracting workers. The state needs to foster high growth industries which lure highly talented workers.

Secondly, the state should invest more in education instead of worrying that college graduates will leave for other states. It is true that we lose some of our college graduates during their early 20s. However, the mobility of workers, especially young people is something that cannot be “curbed” or controlled. While there is little to stop young people from leaving, we can do a lot to encourage educated and highly skilled people to come, live and stay in Wisconsin. Evidence from neighboring states like Minnesota indicate that college education is important in curbing brain drain and that college reputation is the most important factor in attracting young high school graduates. The state should also provide incentives such as specified tuition reduction programs, loan forgiveness, grant aid and/or offer more graduate school scholarships to keep local talent in-state and to attract out-of-state talent. Expanding social opportunities and the cultural diversity of the state can also help as well as fostering ties between colleges/universities and local businesses. In sum, keeping and attracting workers with higher human capital requires us to engage in long-range comprehensive planning.
References


Tornatzky, Louis G., Denis O. Gray et al. (2001).“ Who Will Stay and Who Will Leave?” Southern Technology Council, a division of the Southern Growth Policies Board. skilled and educated young people to find a place that is “active, exciting and fun” (Thomas B. Fordham Institute, 2009).
MISSION AND VISION

The mission of the UWSP Central Wisconsin Economic Research Bureau is to foster economic development by bringing timely economic analysis to our region, focusing on Marathon, Portage and Wood counties. The mission has been accomplished through the publication of Economic Indicator Reports. These reports are compiled and released for each county in Central Wisconsin.

The CWERB aspires to be Wisconsin’s premier research center focused on regional economic development.

HISTORY

The CWERB is a nonprofit organization founded in October 1983. Its operating budget comes from the private sector and the UWSP School of Business and Economics. The CWERB also represents an important part of the outreach efforts of the UWSP School of Business and Economics.

SOURCES OF FUNDING

• UWSP School of Business and Economics
• BMO Harris Bank of Stevens Point
• BMO Harris Bank of Marshfield
• BMO Harris Bank of Wausau
• Centergy Inc. of Wausau
• Community Foundation of Greater South Wood County - Wisconsin Rapids

SCHOOL OF BUSINESS & ECONOMICS

• Enrollment of 1,000 students; More than 30% of our students come from Marathon, Portage and Wood counties; approximately 50% of our graduates stay in the three-county area

• The SBE is in the pre-accreditation phase by the Association to Advance Collegiate Schools of Business (AACSB), once completed, SBE will be among the top 18% of all business schools in the world.

CWERB CLIENTELE

• Central Wisconsin business firms are the most crucial component in the economic development of our region. Business firms are keenly aware of the important role that informed decision making plays in any developmental strategy.

• Private sector organizations devoted to economic development in Central Wisconsin, such as area chambers of commerce and their affiliated economic development agencies.

• Public sector organizations devoted to economic development in Central Wisconsin.

• The general public, in order to make informed decisions, take advantage of the unbiased information and analysis about the economy.

• The CWERB employs student research assistants which provides an excellent educational setting while also providing the opportunity for students to earn funds toward education. Faculty, staff and students at UWSP utilize the reports and resources of the CWERB.

CWERB ACTIVITIES

The dissemination of the CWERB research takes place through various hard copy publications, electronic media reports and presentations. For example, the Economic Indicator Reports are presented in Marshfield, Stevens Point, Wausau and Wisconsin Rapids. The audiences consist of business, political and educational leaders.

The Economic Indicator Reports also contain a special report section that is devoted to a current issue in economics. These special reports are usually presented by UWSP faculty.

Substantial newspaper, radio and television coverage of the publications and presentations have been instrumental in focusing attention on the School of Business and Economics. Chief Economist Randy Cray has been interviewed by the local media as well as the Chicago Tribune and CNN Radio on a variety of economic matters.