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Thompson, Eric; Zhang, Ziwen; Pham, Trung; and Campbell, Elliot, "Real Impact of Migration" (2012). *Business in Nebraska*. 63.

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Business in Nebraska

VOLUME 67 No. 702

PRESENTED BY THE BUREAU OF BUSINESS RESEARCH (BBR)
OF THE UNL COLLEGE OF BUSINESS ADMINISTRATION

JUNE 2012

REAL IMPACT OF MIGRATION

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With Contributions from Elliot Campbell

Introduction

In response to economic shocks, such as the Great Recession, people seek out opportunities to return to normalcy. One way is to relocate to a new area. This study examines the people who move from one state to another, seeking better opportunities, and in the process, aiding to rebuild the U.S. economy.

This study does not simply count the number of migrants, it also examines the attributes of migrants to determine the human capital, or productive skills, they possess and are willing to provide to the market. Each person, due to characteristics such as education and work experience, has a different level of skill. While there is no way to identify exactly how much human capital a person possesses since no person is the same as another, these characteristics heavily influence the human capital stock of individuals. To develop a comprehensive measure of human capital stock, this study considers an array of characteristics which influence human capital stocks, including education attainment, work experience, health, and other variables such as marital status which can influence the opportunity and pressure individuals face to accumulate human capital.

The next section describes the Model and Data Sources for the study. The third section provides Results. The Results section is separated into Regional Comparison, to examine the U.S. as a whole, and States Surrounding Nebraska, for a more local perspective. The fourth and last section is the Conclusion.

Model and Data

Model

In 1974, Economist Jacob Mincer formulated an equation linking human capital and wages. In that equation, the hourly wage rate was modeled as the returns to human capital. Specifically, the natural logarithm of hourly wages was a function of individual characteristics that determine human capital as in the equation below:

$$\begin{aligned} \text{hourlywage} = & \beta_0 + \beta_1 \text{Edu} + \beta_2 \text{Exp} + \beta_3 \text{Sex} + \\ & \beta_4 \text{Race} + \beta_5 \text{Mar} + \beta_6 \text{Union} + \beta_7 \text{Dis} \\ & + \varepsilon. \end{aligned}$$

In the equation, *hourlywage* is natural logarithm of an individual's hourly wage, *Edu* is level of education attainment, *Exp* is work experience, *Sex* is gender, *Race* is ethnicity, *Mar* is marital status, *Union* is union affiliation, *Dis* is disability status, and ε is the error term. The intercept term, β_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, or the amount of roads or other public capital per worker. Other coefficients (β_1 - β_7) show the influence of human capital characteristics on hourly wages.

In this study, we estimate the above equation and use the results to predict the human capital of state-to-state migrants. More precisely, estimation results are used to determine the hourly returns to each migrant's human capital. These hourly returns are converted to "full time equivalent" annual returns based on a 2,000 hour work year. Each migrant's current returns to human capital are assumed to per-

sist in real (inflation adjusted) terms. Annual returns are then used to calculate the lifetime value of each migrant's human capital stock. This is done in the same way that annual profits are used to estimate the value of a company's stock. In particular, the the present discounted value of future annual returns to human capital are used to estimate the migrant's human capital stock.

We then consider how much human capital each out-migrant removes from a state by relocating, resulting in the "brain drain" effect, or human capital flight. Alternatively, "brain gain" is the product of in-migrants, when a state receives an inflow of persons with human capital. Of course, this process begins by gathering the data required to estimate the equation on the previous page. These data sources are described in detail below.

Data Sources

Since 2000 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. The survey gathers information from the time of the survey or the twelve month period leading up to the issue of the survey. Individual responses are weighted to indicate the amount of people each respondent represents. Due to a limited sample size in the earlier years of the survey, the period considered by this study is 2005 to 2010. The Mincer equation is estimated using the ACS data to determine the hourly rate of return on human capital of each migrant. This information, utilizing the weights, is used to calculate the human capital transferred when migrants leave one state for another

Education attainment is the key variable influencing human capital. The value of the education attainment variable in the ACS ranges from no years of formal 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 human capital. Work experience permits an individual to become more productive, and therefore earn a higher income. In our analysis, we utilize age as a proxy for "potential experience." This is necessary because the ACS survey does not directly ask respondents about their years of work experience. However, experience should rise with age among workers who consistently remain the

workforce.¹ The link between potential experience and actual experience may be more tenuous for women than for men since women are more likely to spend time out of the formal labor force with family responsibilities. We therefore include a gender variable in our equation.

Further, family obligations in general may motivate some individuals to take on extra responsibilities at work, gaining extra experience that translates into greater human capital. Finally, health problems may reduce human capital for some workers, if illness causes workers to miss work for an extended period or to lose some of their coordination or knowledge. We therefore include a variable for disability status in our Mincer equation.

Besides factors that influence human capital, we also control for factors that may affect wages, without being tied strictly to human capital, such as union affiliation. Specifically, union affiliation can distort the link between human capital and wage rates. While data on union affiliation is not gathered by the ACS, we did develop a variable for to simulate a probability of union affiliation. In our analysis, to be considered as a union member, an individual must be at least 18 years of age, currently working and worked in the previous 12 months, and have a weekly wage within a \$150 range of the average wage of union members of the industry in which the individual is employed.

Results from estimates using the Mincer equation were used to calculate the hourly return from human capital for each state-to-state migrant. As noted earlier, hourly returns were converted to annual returns assuming a 2,000 hour work year, and annual returns are assumed to persist in the future. Future returns are then used to estimate the migrant's human capital stock, using a 10% annual discount rate.

Finally, when reviewing the results below, note that features of the ACS limit the analysis of this study in several ways. First, this study examines only domestic migrant workers who have relocated within the past year, but have resided in their new states more than three months. Second, since the focus of this study is the amount of human capital that a migrant takes from the state of former residence, only

¹ Formally, potential experience age -6-years of schooling.

working individuals (between the ages of 16 and 70) are taken into consideration. Those without a wage earning are not included in our sample.

Results

Regional Comparison

A regional comparison of domestic migration clearly illustrates gainers and losers (Figure 1) within the borders of the United States. In general, workers migrate from the northeastern regions to the south and west; with the Southeast and Southwest gaining the most working migrants from 2005 to 2007. Then, with the onset of the 2007 real estate retraction, the two regions began to gain less, while other regions either gained more or lost less. With regards to human capital, the two regions have been net gainers throughout the entire 2005-2010 period.

The Midwest and Great Lakes regions experienced the largest loss of working migrants from 2005 to 2010. This trend was also reflected in net human capital outflow; however, the human capital loss of the Great Lakes was consistently low. The Midwest had the largest loss in human capital over the peri-

od. The Far West lost working migrants on net between 2005 and 2010, but gained human capital from migrants during most years. In the Far West, the human capital of working in-migrants exceeded the human capital of out-migrants, in general.

While the Southeast and Southwest regions gained the largest net inflows of workers and human capital, the Rocky Mountain region experienced a steady net inflow of working migrants but small net increases of human capital, and an outright decline of human capital in one year. (A characteristic exhibited by a state in the region examined—Colorado below in Figure 3.) The New England and the Plains regions were quite stable in terms of both working migrants and human capital, both remaining close to zero on net.

Figure 1 reveals that the change of net migration of workers between the regions in the period of 2005 to 2010 as relatively modest, and in light of the real estate surplus of 2007, migration decreased; this result points at an ever present issue of the cost of migration. Aside from uprooting a family, the cost

Figure 1 Net Flows Migrant Workers and Their Human Capital (In Hundred Thousand Dollars) of Regions

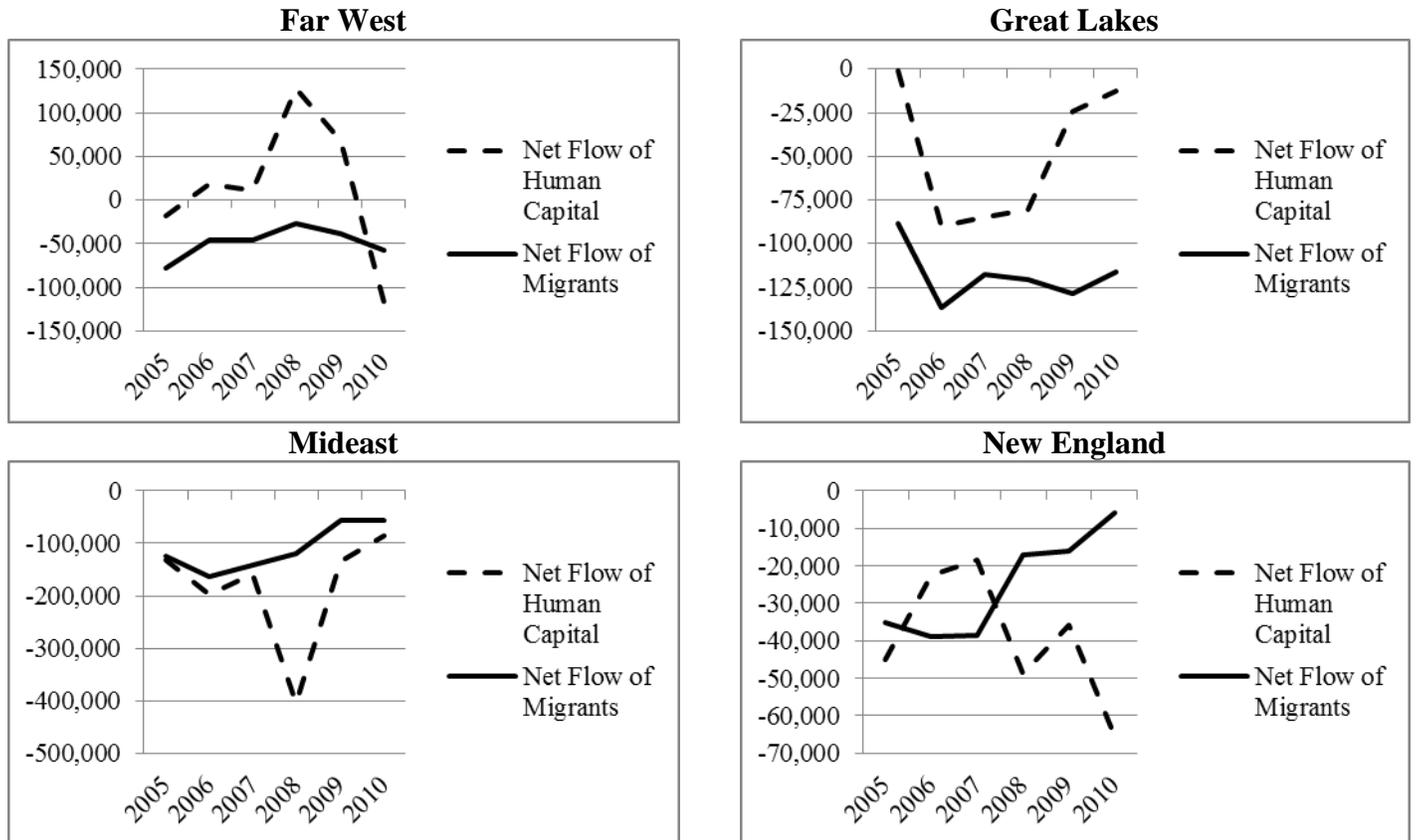
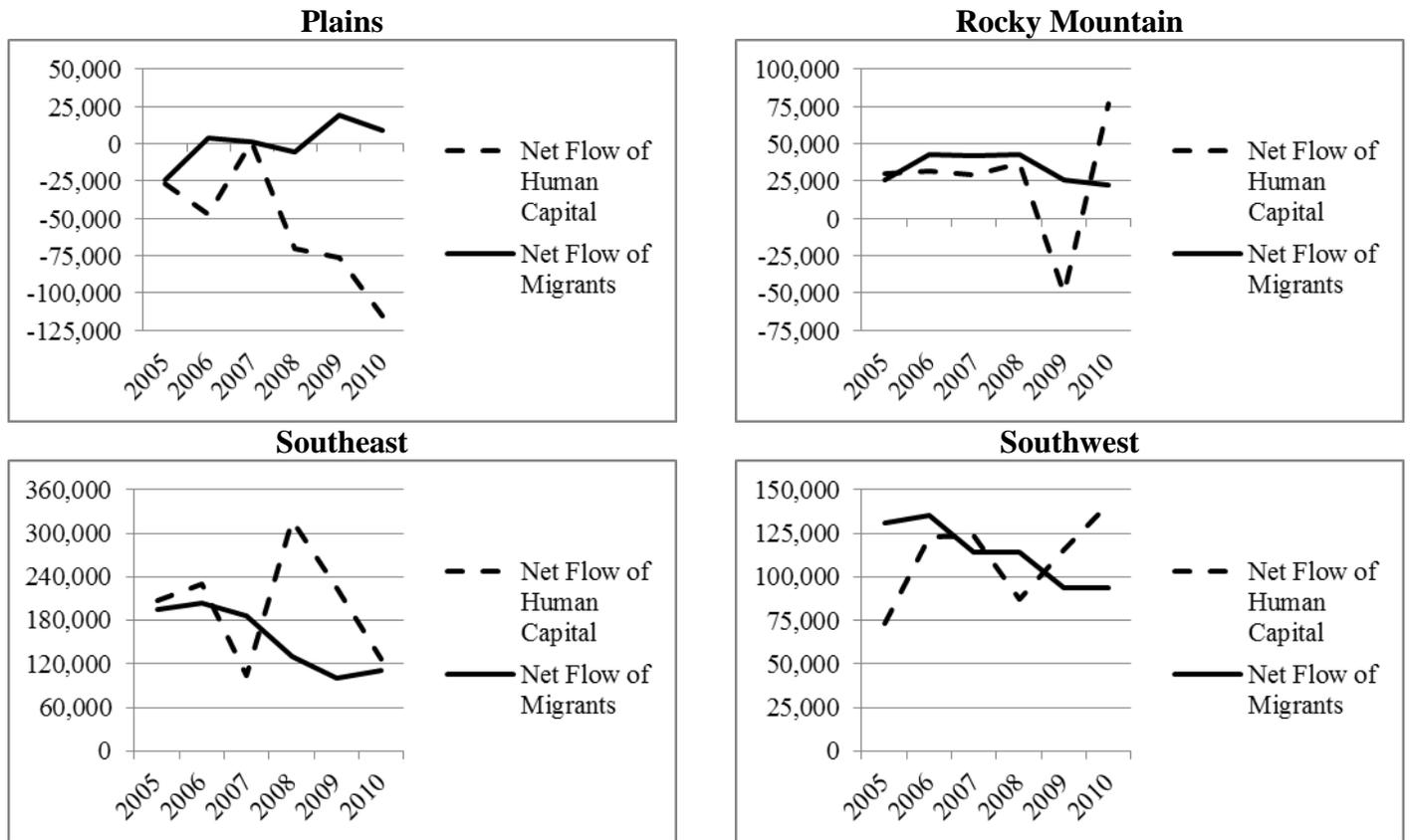


Figure 1 Continue



This geographical area set of Regions was classified by the Bureau of Economic Analysis based on homogeneity of the states within them in terms of economic characteristics, demographic, social, and cultural characteristics. Composition as follows: Far West (Alaska, California, Hawaii, Nevada, Oregon, Washington), Great Lakes (Illinois, Indiana, Michigan, Ohio, Wisconsin), Mideast (Delaware, District of Columbia, Maryland, New Jersey, New York, Pennsylvania), New England (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont), Plains (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota), Rocky Mountain (Colorado, Idaho, Montana, Utah, Wyoming), Southeast (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, West Virginia), Southwest (Arizona, New Mexico, Oklahoma, Texas).

of moving personal belongings and liquidating or relinquishing durable items may present a challenge for migrants. When the price of real estate in the U.S. collapsed in 2007, many home owners were left with large mortgages that prevent them from trading one home for another, thus constricted the flow of migrants.

Nebraska and Michigan

We move now to a comparison of Nebraska, a state with one of the lowest unemployment rates in the nation, and Michigan, a state with one of the highest unemployment rates in recent years, and which suffered from large scale dislocation within the U.S. auto industry. One thing that is immediately evident is that Nebraska has a hidden problem. Despite its low unemployment rate, and a net inflow of workers, Nebraska has a net outflow of human capital. Michigan, by contrast, had a small net outflow of

human capital, despite a high unemployment rate and a large decline in workers.

Initially, in 2005 and 2006, Nebraska experienced an outflow of both workers and their human capital. Then, from 2007 onward, the state began to gain workers yet still lost human capital, with a striking decrease in 2008. In recent years, while Nebraska gained population and workers, the in-migrants have not replaced the human capital of the out-migrants from the state. Figure 2 reveals a relatively narrow difference between in- and out-migration for the State, but the gap of human capital of the migrants is much larger, especially in 2008.

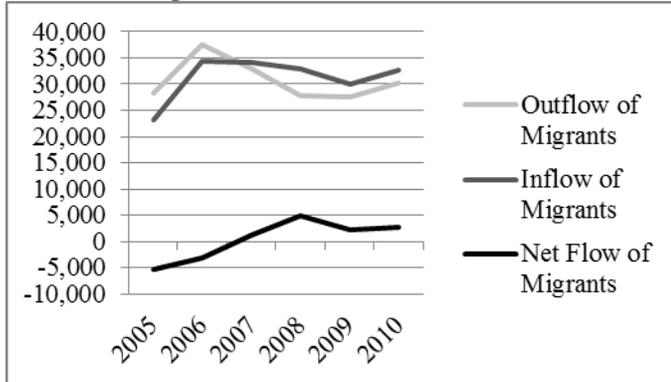
By contrast, in Michigan, while the net loss of workers is high, the net loss of human capital is low, suggesting that workers with higher human

capital are remaining in or migrating to the state. In particular, the loss of human capital in Michigan declined beginning in 2008. This may be attributed to the restructuring of the large manufacturing employers in the state. Lower human capital workers may have fled the state in response to lost opportunities in manufacturing and fled to states like Ne-

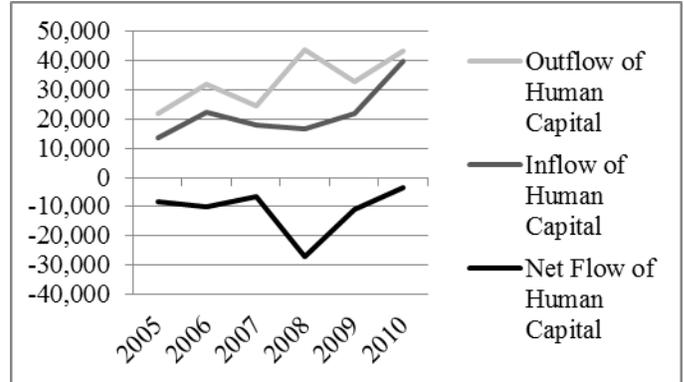
braska with a more prosperous economic base. At the same time, higher human capital opportunities in design and technology may have continued to expand in Michigan. Our findings therefore may reveal the restructuring of states like Michigan into higher human capital economies.

Figure 2 Nebraska and Michigan

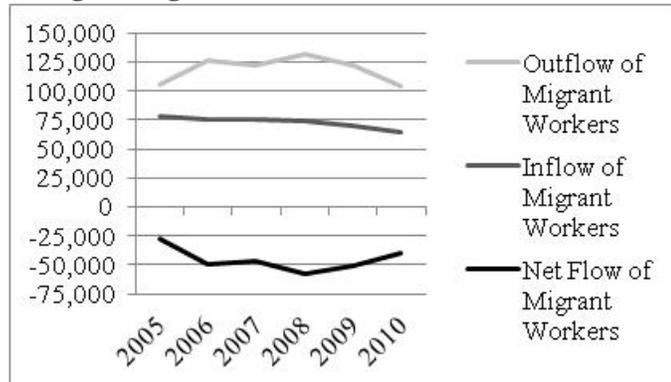
Nebraska Migrant Workers



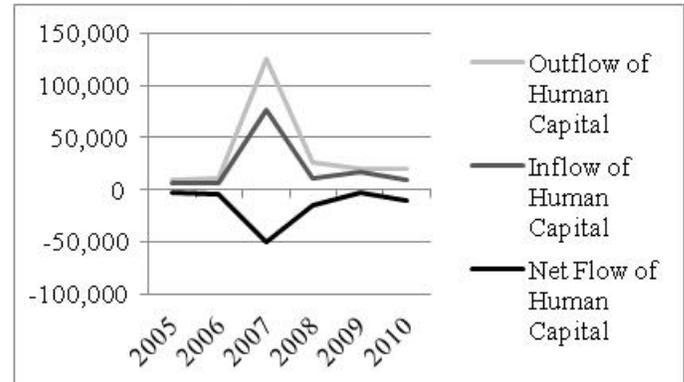
Nebraska Human Capital of Workers (In Hundred Thousand Dollars)



Michigan Migrant Workers



Michigan Human Capital of Workers (In Hundred Thousand Dollars)



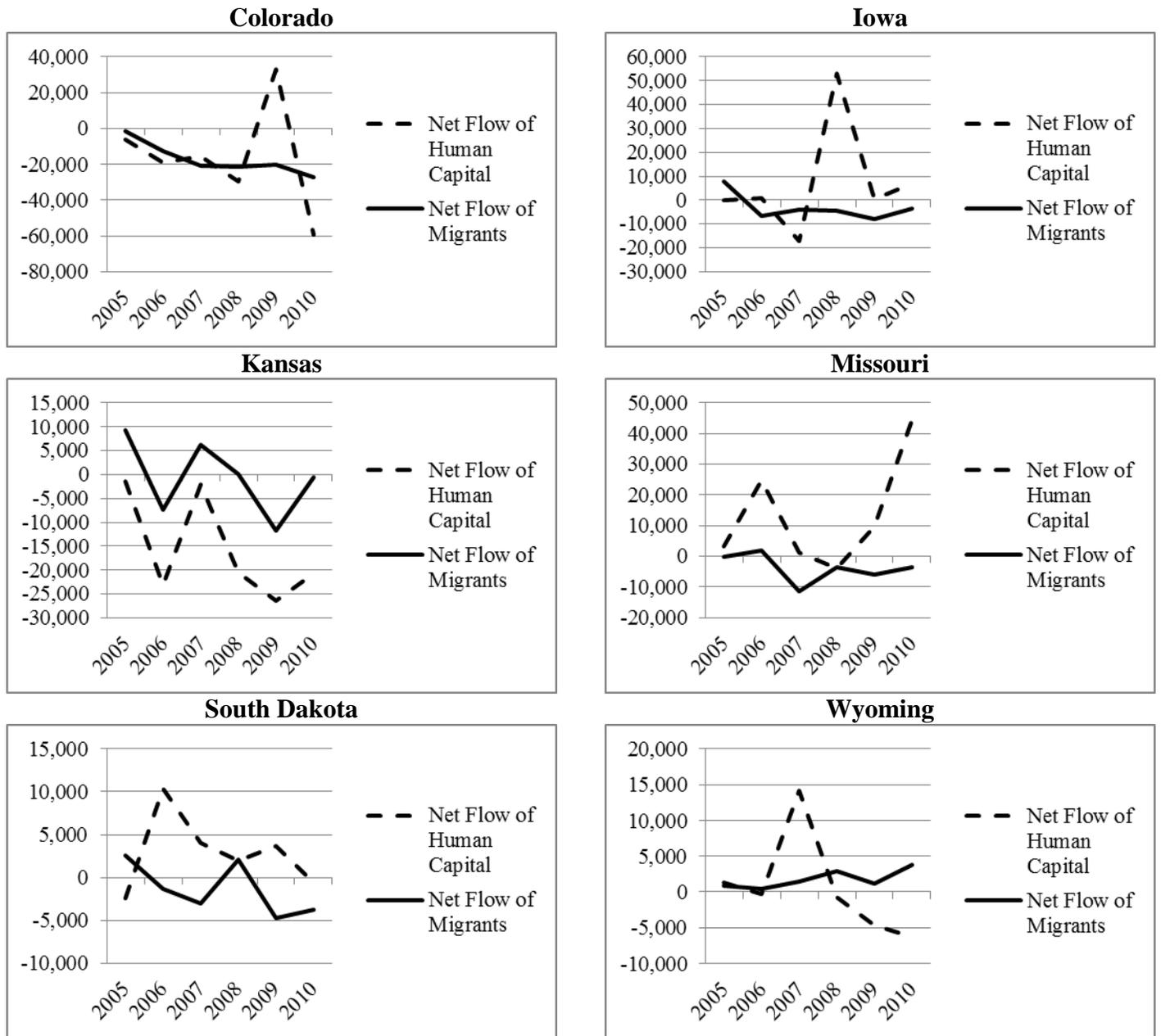
States Surrounding Nebraska

Of the states surrounding Nebraska, Kansas, Wyoming, and Colorado also experienced brain drain during the 2005-2010 period. Though it received an inflow of workers in 2005 and 2007, Kansas lost both workers and human capital in all other years, particularly 2009. Colorado lost workers in all years and human capital in all but one year. Wyoming was the state most like Nebraska. Wyoming experienced a net inflow of workers during the entire period of 2005 to 2010 but a net outflow of human capital in all but one year. Like Nebraska, Wyoming has been less successful in attracting or retaining higher skill workers than lower skill workers.

In contrast with Nebraska, Iowa, South Dakota and Missouri in most years were able to attract human capital on net, despite a fairly consistent loss of working migrants. These states were relatively more successful at attracting or retaining higher skill workers.

Overall, these results point out that in some regions of the country there is no clear relationship between net flows of workers and net flows of human capital. Positive net flows according to one measure are often accompanied by negative net flows in the other. This result points to role of migration in the potential restructuring of state economies according to skill. The result also points to the importance of

Figure 3 Net Flows Migrant Workers and Their Human Capital (In Hundred Thousand Dollars) of States Surrounding Nebraska



measuring and reporting the net flow of worker counts and of human capital in states.

Conclusion

This study focused on the net migration patterns of domestic, employed persons between 2005 and 2010. Net population and human capital flows were examined for the 9 major regions of the U.S. and for Nebraska and all surrounding states. Our interest in human capital flows is the reason for focusing on employed persons, and excluding retirees, others outside the labor force, and international migrants. Human capital levels are difficult to judge for per-

sons outside the labor force. Further, the education and experience of international workers may not contribute to human capital in the same way as education and experienced gained in the United States.

Results of the analysis confirm that it is critical to look both at the net population count and net human capital measures of migration flows. The two flows often differ. For example, some states which are gaining workers on net are losing human capital, since the skill level of out-migrants is higher than that of in-migrants. This was the recent pattern in Nebraska. It was also the pattern in the neighboring

state of Wyoming. By contrast, the neighboring states of Iowa, South Dakota, and Missouri often were able to attract human capital on net, despite fairly consistent net outmigration of workers.

Among the major regions of the United States, the Southwest and Southeast regions attracted both workers and human capital on net. The Plains region was close to unchanged in terms of the net migration of workers and human capital. Great Lakes states and in particular Michigan (the only state to lose population between the 2000 and 2010 Censuses) experienced large net losses of workers but only small net losses in human capital. In other words these struggling state economies may not be fairing as poorly as migration trends and population loss suggest, and also may be restructuring into higher human capital economies.

Another major trend is that the net migration flows appear to be slowing in recent years. In particular, the real estate collapse and rising unemployment associated with the “Great Recession” significantly inhibited the net migration flows of worker counts and human capital beginning in 2008. This may reflect both waning opportunities in “magnate” regions in the Southeast and Southwest as well as higher costs of selling a home and moving after the home price collapse.