How ya gonna keep 'em down on the farm: Which Land Grant graduates live in rural areas?

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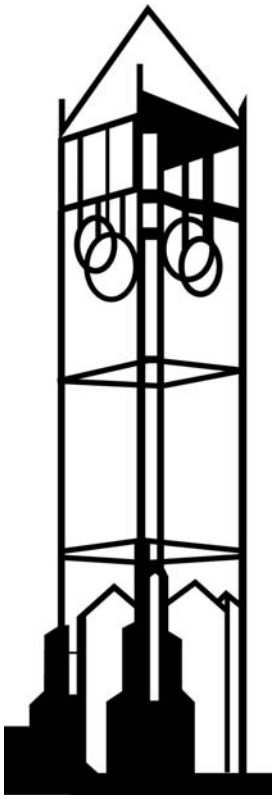

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How ya gonna keep 'em down on the farm: Which Land Grant graduates live in rural areas?

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> "*Iowa suffers from an alarming brain drain: It loses more of its young, single, well-educated adults than any state except North Dakota. In search of bigger cities, hipper crowds and warmer weather, young Iowans flee in such numbers that demographers predict the state will face a drastic labor shortage within two decades." Los Angeles Times, February 6, 2005.*

Rural areas of the U.S. have been experiencing out-migration of young, educated adults, or "brain drain", for a long time. Theodore Roosevelt's 1907 establishment of the County Life Commission was due in part to concern about, "the apparent tendency of the smartest and most promising young people in the countryside to move to cities" (Danbom, 1995, 167). But with increased attention to the role of human capital in economic growth brain drain issues are receiving a renewed emphasis today. Human capital and knowledge are key drivers of economic growth. A better educated workforce improves the ability of local businesses to adapt to change, process new information, adopt technology and respond to emerging market opportunities. Higher levels of human capital facilitate networking and the spread of ideas, heighten social capital and are associated with increased entrepreneurial activity and small business development (Barkley, Henry and Li, 2005). Clustering of college educated workers may have spillover effects, enhancing a region's productivity and the potential for economic growth (Gottlieb and Fogarty, 2003).

A related body of research has contributed to a heightened interest in migration patterns of college-educated workers. Despite decades of research, the question of whether people follow

jobs or jobs follow people remains unresolved. The traditional view held jobs, and hence business development, came first. More recently, particularly with the work by Richard Florida on the creative class, there is support for the alternative, that is, jobs follow people. After all, it is people who create businesses and therefore jobs. The thinking goes that if a state or region can attract or retain college-educated workers, job creation will follow.

Certainly the concern about brain drain is not a uniquely rural problem. Studies document the out-migration of educated youth from cities like Pittsburgh and Cleveland (Hanson, et al, 2003; Gottlieb, 2001). But for rural communities, both the incidence and the consequences of brain drain may be more severe. Regions that have lost population, like the largely rural Great Plains, tend to experience brain drain. There is a type of adverse selection at play, whereby the most educated people, who are also the most economically mobile, are the first to leave (Feser and Sweeney, 1998).

While the dense nature of cities generally provides a variety of employment opportunities for college-educated workers, rural areas suffer from a "thin" labor markets problem. Not only are the jobs fewer and far between, but a mismatch between labor demand for high-skills in rural areas and the skills of local educated youth contributes to out-migration from many rural areas (Mills and Hazarika, 2002; Huang et al. 2002). The problem is only exacerbated for working couples (Costa and Kahn, 2000). Out-migration from rural areas also imposes more immediate costs on the less mobile who are left behind. In a world of economies of scale, declining populations and dwindling tax bases make it increasingly difficult for rural communities to deliver public services efficiently (Kilkenny, 2009).

Despite these challenges, brain drain from rural areas is not a given. Some rural counties are gaining in their share of college-educated workers (Gibbs and Cromartie, 1994; Artz, 2003).

There is also evidence that many young people would remain in or move to rural areas if available job opportunities were comparable in type and pay to jobs in urban areas (Brown, et al. 1997; Mills and Hazairka 2004; Shields, Goetz, and Wang 2005).

Given the critical importance of this problem for rural communities there is a surprising lack of information about the causes and consequences of rural region brain drain. This is not to say that states haven't tried to do something about it. From college scholarship programs to tax breaks for twenty-somethings to letter writing campaigns urging former residents to return, a variety of policies solutions have been proposed and implemented in an attempt to slow or reverse the tide of brain drain (Wirtz, 2003). But it's unclear if any of these have been made a difference. Should communities and states try to keep their young educated residents from leaving the first place? Should policies target former residents? Should states attempt to attract more out-of-state students to their colleges in the hope that these students will chose to stay after graduation? A better understanding of the factors affecting rural residence choice of college-educated adults may help improve policy design and targeting.

We examine data on the residence choice of college-educated adults using a unique dataset resulting from a 2007 stratified random sample survey of 25,000 Iowa State University (ISU) Alumni graduating between 1982 and 2006. As a large Land Grant university in one of the more rural states in the U.S., ISU attracts a large number of students who were raised in rural areas. The survey asks respondents about where they were raised and where they resided after graduation in addition to a variety of questions about their careers subsequent to graduation. Approximately 5400 responses were received. In addition, the information from the survey has been matched to student records containing information about majors, coursework, extracurricular activities and residential status while at ISU.

We use the Economic Research Service's rural-urban continuum codes to define rural, including codes 6 though 9 as our definition of rural[1]. The most recent (2003) codes were used to define current residence status, while the 1993 version of the codes were used to define origin status for all but the most recent alumni.

Explanations for rural brain drain focus on two primary drivers: economic opportunity and quality of life. To various degrees, rural areas of the U.S. lack both. Jobs, especially high skilled jobs are located predominately in cities. Quality of life, broadly measured by all the attributes that make a place attractive to live varies across locations (Black, Kolesnikova, and Taylor; 2009). Much recent research on rural population growth has focused on the positive role of natural amenities for in-migration. Natural amenities are an important factor in areas of the U.S. like the intermountain West, coastal areas, and parts of the South, where warm climate and scenic views have attracted in-migrants, but they are only one aspect of quality of life. Richard Florida focuses on the importance of cultural amenities, nightlife and diversity for the creative class. Other factors such as housing costs, crime rates and access to services like health care and schools may be important considerations for other demographic groups. In addition, family related factors play an important role in long-distance migration decisions. Data from the March 2008 Current Population Survey show reasons given for long distance moves (greater than 50 miles) are related predominately to either employment (47 percent) or family (28 percent).

While family and quality of life factors are important, they can be difficult to quantify. Furthermore, recent research finds that, particularly for young college educated workers, employment opportunity is the primary concern in choosing where to live (Chen and Rosenthal; 2008). In the sections that follow, we present data on the location choices of ISU alumni to try

[1] We repeated the analysis using all non-metropolitan codes to define rural status. While the magnitudes changed, the patterns in the data were qualitatively similar to what we report here.

to understand which graduates choose to reside in rural areas after college. We focus our discussion on four major questions of interest to economic development practitioners and policy makers: 1) Which college graduates choose to live in rural areas? 2) How do rural college graduate goals differ from their urban counterparts? 3) How do rural college graduates differ from their urban counterparts in occupation and income? 4) Is interest in rural life increasing or decreasing over time?

Which college graduates choose to live in rural areas?

Figure 1 depicts the spatial pattern of alumni respondents' 2007 residency. Despite a perception that Midwestern youth are leaving for the coasts in droves, the survey data show that the majority of ISU graduates have remained in the Midwest. Thirty-eight percent currently reside in Iowa and an additional 37 percent live in surrounding states.

ISU graduates are leaving rural areas, however. Table 1 shows the percent of alumni respondents who resided in rural or urban locations in 2007 relative to the type of location in which they were raised. There is clear evidence of rural to urban migration among ISU alums. Roughly three of every ten respondents were raised in a rural location, yet only one in ten currently resides in a rural county. Alumni who grew up in a rural location are more likely to currently reside in a rural county than those who were raised in urban locations. Three-fourths of rural residing alumni were raised in a rural location.

One of the main obstacles in stopping or reversing rural brain drain is the fact that young, single, college-educated people are the most footloose group in our society (Franklin, 2003). New college graduates face national job markets and enter professions in which experience is important for career advancement. Young people often move away from home upon graduating from college in order to find a suitable entry-level position. Relative to other workers, recent

college graduates are less likely to be married, have children, or own their home, all factors which tend to increase the costs of moving and therefore reduce the likelihood of long-distance moves. These factors also influence the choice of metropolitan areas over more rural places. A recent Pew Research Center survey finds most young people prefer large cities (El Nasser, 2009).

However, studies have shown that a prior migration experience increases subsequent mobility (for example, Faggian, *et al*, 2007). Out-migration of younger college educated workers may be offset by net gains in older, more experienced college-educated workers (Hunt, 2009; Gibbs and Cromartie, 1994). In the 1990s rural America as a whole experienced net losses of 20 to 29 year olds, but net in-migration of adults in their 30s and 40s (Johnson, 2006). Migration decisions of adults in their 30s and 40s may be influenced more by 'quality of life' and family issues and relatively less by job market opportunities (Graves; 1979; Sandefur, 1985; Feridhanusetyawan, 1994; Peri, 2001; Von Reichert, 2002).

To examine the location choices of alumni by age, table 2 breaks down the percentage of alumni raised in rural counties and currently residing in rural counties by graduation cohort. The most recent graduates have the greatest share of alumni currently living in a rural county. Some of this can be explained by the greater proportion of rural raised students in these cohorts. As noted in table 1, rural raised alumni are more likely to choose rural residences after graduation. To account for this, we construct an approximate retention rate in the rightmost column by dividing the percent living in a rural county in 2007 by the percent raised in a rural county for each cohort. In essence, this measures the proportion of rural students who chose a rural residence after graduation. By this measure, it appears that conditional on growing up in a rural county, alumni in their 30s and 40s are somewhat more likely to currently reside in a rural area.

A large proportion of migrants are repeat movers, and a significant fraction of repeat movers are return migrants (Kennan and Walker; 2003). Attachments to particular places, whether in the form of accumulated knowledge or familiarity about a place, social or family ties, tend to increase the potential benefit of return migration (DaVanzo, 1988; Dierx, 1988). The vast majority of respondents to our survey (91 percent) migrated to Iowa State from a home county other than Story County, Iowa and most have moved again since graduating. One question is whether alumni return to their home county or whether they move on. The majority of ISU alumni are repeat migrants; 69 percent were living in a location in 2007 that was neither their home county nor Story County. Roughly 18 percent are returned to their home counties. A greater proportion of rural raised alumni are repeat migrants (79 percent) and fewer (15 percent) had returned to their home county by 2007. The youngest cohort, alumni graduating between 2002 and 2006 have the highest proportion of return migrants. One-fifth of these alumni were living in their home county in 2007. Younger alumni have more recent experiences living in their hometown and as such have had less time for their location specific capital to depreciate. They may also be more likely to require financial support from their parents. Between 11 and 13 percent of cohorts more than ten years out of college had returned to their home county. These data suggest that many recent graduates return home or stay in Ames upon graduating but later migrate away to other places. It does appear that older alumni are more likely to reside in a rural area conditional on growing up rural, but not necessarily in the same rural county in which they were raised.

Education

Anecdotal evidence from our interaction with rural raised students suggests that many choose their majors in at least in part because they intend to return to a rural area, perhaps the family farm, after graduation. Table 3 presents the distribution of alumni respondents across

colleges by rural origin and current rural residency. Almost half of the students with degrees from the College of Agriculture and Life Sciences (CALS) were raised in rural areas. In addition, these alumni are the most likely to be living in a rural county in 2007. Over one quarter of Agriculture and Life Sciences alumni reside in rural areas, more than twice the proportion of graduates from any other college. Nearly 60 percent of rural origin students who major in the College of Agriculture and Life Sciences resided in a rural county after graduation and roughly one-fourth returned to their home counties.

The College of Human Sciences attracts the second highest proportion of rural raised students, at nearly 30 percent, as well as the second highest share of rural alumni residents. This college hosts a variety of degrees that would prepare students for jobs in rural labor markets, including education, family and consumer sciences and hotel, restaurant and institution management. Graduates from the Colleges of Engineering and Design are least likely to reside in a rural location after graduation, but are also least likely to have grown up in one.

While there may be rising skill requirements in rural labor markets, job opportunities for workers with post-baccalaureate degrees are still relatively uncommon in rural counties. Rural population shares reflect this fact. Data from the 2000 Census show that 20.6 percent of urban residents hold a graduate degree (Master's, Professional or Doctorate). The corresponding share for rural residents is 11.5 percent. Fewer alumni living in rural counties hold graduate degrees. One-quarter of alumni in rural counties have a graduate degree compared with 38 percent living in urban counties.

How do rural college graduate goals differ from their urban counterparts?

Given the typically higher returns to a college degree in urban areas relative to rural areas, the fact that some ISU alumni are choosing to settle in rural counties may reflect not only

differences in their training and interests, but also differences in their attitudes toward work. Our survey asked respondents to rank a series of factors important in choosing a job or particular field in which to work on a Likert scale ranging from 1 representing "not important at all" to 5 indicating "very important". Table 4 reports the mean responses for urban and rural residing alumni along with a statistical test to determine if the means were significantly different.

On average, rural residents ranked non-pecuniary goals such as carrying on a family tradition and building a business for children to inherit significantly higher than did urban residents. Rural residents placed greater importance on having freedom in their work, fulfilling a personal vision and following the example of someone they admired than their urban peers. They were also more concerned about earning the respect of their friends. In contrast, urban residents rated the importance of high income or wealth and the creation of new products or ideas significantly higher than did rural residents.

How do rural college graduates differ from their urban counterparts in occupation and income?

For most working-age people, economic opportunity is of primary concern. Most of us earn a living by working, either for someone else or for ourselves and as a result, migration and residence decisions are intricately linked to employment opportunities. Bureau of Economic Analysis statistics for 2007 show that the vast majority of jobs are located in urban areas; metropolitan areas account for 85 percent of U.S. jobs. Clearly the distribution of jobs between rural and urban areas varies by industry. Natural resource based industries like farming, fishing and mining, as well as those industries which serve them, are more prominent in rural areas. Traditionally, the industries important to rural areas employed a large share of low-skill workers. Gibbs, Kusmin and Cromartie (2005) estimate that low skill jobs comprised 42.2 percent of nonmetropolitan jobs in 2000, roughly one-fourth larger than the share in metropolitan areas

(34.0 percent). However, they also find that the share of low-skilled jobs fell faster in non-metropolitan areas than in metro areas. The authors contend that this trend is a consequence of rising job skill requirements across industries, due partly to capital-labor substitution particularly in manufacturing, but also to rising demand for professional, technical and managerial skills. This suggests rising opportunities for some college-educated workers in rural areas of the U.S. Certainly, the fit between an individual's skills and training and the jobs available in a particular region is an important aspect of residence choice. In this section, we examine employment-related characteristics of alumni respondents and their relationship to residence choice.

Employment

The vast majority of respondents reported working at least part-time for themselves or someone else. A greater share of rural residents reported working part-time (9.8 percent for rural; 6.9 percent of urban residents). Alumni living in rural counties also had higher self-employment rates: roughly 15 percent of alumni living in rural counties reported being self-employed compared with 7.4 percent of alumni in urban counties.

Survey respondents were asked to report all the industries in which they had worked since graduation (table 5). Two industries dominate rural alumni's employment experience; nearly a third of rural alumni reported working in agriculture while another 30 percent had worked in education. Urban alumni's employment experiences are more evenly distributed among industries.

Although the industries varied, there was some overlap in the types of occupations held by rural and urban alumni. For both, the most common occupation was professional and technical, with sales and related occupations and service sector occupations ranking among the top five most common occupations on both lists. Occupations in farming, fishing and forestry

ranked fourth highest for rural residents and chief executives ranked fifth. For urban residents, marketing and sales managers and computer and information systems managers rounded out the top five.

Self-Employment

Self employment can provide flexibility and a degree of independence in addition to a way for some people to remain in, or relocate to, a chosen location, frequently one close to where they grew up (Tosterud and Habbershon, 1992). This option may be especially important for rural areas where high skill job opportunities are less common. In fact, previous research has found that, relative to metropolitan residents, non-metropolitan residents have higher rates of self-employment (Robinson, 2006). Our data reflect this as well: 14.8 percent of alumni living in rural counties reported being self-employed, either full-time or part-time. This compares with 7.4 percent of urban alumni residents.

Wortman (1990) defines rural entrepreneurship as "the creation of a new organization that introduces a new product, serves or creates a new market, or utilizes a new technology in a rural environment". Of the 872 alumni reporting they had started at least one for-profit business, roughly 25 percent located their enterprise in a rural county. Alumni with rural origins were more likely to create rural businesses: of the rural raised entrepreneurs, half started their business in a rural area. Roughly 16 percent of urban raised entrepreneurs created rural businesses. A greater proportion of rural entrepreneurs started their businesses in their home county. Specifically, 37.1% of rural businesses were started in rural entrepreneur's home county and 18.9% of urban businesses were started in urban entrepreneurs' home counties.

Similar to the statistics for jobs held by rural alumni, the most common industry for rural business start-ups was agriculture. One-third of rural businesses started by ISU alumni were

related to agriculture (table 6). The next most common industry for rural business startups was retail. At the time of the survey entrepreneurs who started businesses in rural areas were slightly more likely to still have ownership of their businesses than those in urban areas: 73.6% of rural businesses were still operational and owned by the time of the survey, 2.62% higher than urban businesses. However, it is noteworthy that rural entrepreneurs who closed, sold or passed down their businesses, tended to leave for urban areas. Of the entrepreneurs who left their rural business, 40 percent were living in urban areas at the time of the survey.

Income

One of the major explanations for rural brain drain is that urban areas offer higher returns to education than do rural areas. Kusmin, Gibbs and Taylor (2008) report that college graduates earn 23 percent less in nonmetropolitan areas even after controlling for personal characteristics. Table 7 reports average earnings for urban and rural residing ISU alumni by educational achievement, graduation cohort and college of degree. These data suggest that, on average, urban alumni earn 57 percent more than rural alumni. The earnings differential appears to widen with experience: for the youngest cohort of alumni the urban to rural income ratio is 1.16, while for those who graduated before 1991, the ratio is roughly 1.70. As suggested above, the demand for college graduates in rural labor markets is lower than in urban labor markets and is found in different industries. The bottom panel of table 6 shows average earnings for rural and urban alumni by the college of their degree. The smallest income gaps are seen in agriculture and human sciences (which includes education), the two most prevalent sources of jobs for rural alumni. While cost of living differences and a willingness to accept lower wages in exchange for living in a more desirable location may explain some of this rural-urban income gap, it is

noteworthy that the majority of ISU alumni in rural areas work in industries where this earnings gap is lowest.

Explaining the choice of rural residence

Comparison of the characteristics of rural and urban residents provides some insight into which ISU alumni choose to live in rural areas. Clearly, many factors influence the residence decision of college graduates. Descriptive measures, while informative, do not reveal the relative importance of factors in predicting which graduates will chose rural locations after college. In this section we report the results of logistic regression analysis to examine the role of personal characteristics in ISU alumni choices about rural versus urban residence. The dependent variable is dichotomous, equal to 1 if the alumnus/alumna resided in a rural county in 2007 and 0 otherwise. Personal characteristics hypothesized to impact alumni's location decisions are included as independent variables. While we include some measures of employment history, such as college major and number of occupations since graduation, we do not include employment status because we cannot be confident that employment and location are not simultaneously determined. Table 8 reports the results of the analysis. A variety of the patterns illustrated above are confirmed in the comparative statics framework.

The most important factor for predicting rural residence in 2007 is rural origin. This finding is roughly consistent with Hansen, et al. (2003) who find that attending college in the Pittsburgh area was the most important predictor for explaining which Pittsburgh area college students stayed following graduation. But, as noted above, even if they choose rural residency, it is not necessarily the case the rural raised alumni are returning to their home counties.

Holding a bachelor's from the College of Agriculture and Life Sciences increases the probability of living in a rural location after graduation, while Engineering graduates are significantly less likely to live in a rural location. Having an advanced degree reduces the likelihood of choosing rural. Other personal characteristics also influence the choice of rural residency. The probability of living in a rural county increases with age and with being married. Non-white individuals are less likely to reside in rural counties.

There are significant differences in alumni career preferences related to the choice of a rural residence. Rural alumni place greater value on non-pecuniary career goals such as fulfilling a personal vision or building a business for children to inherit, while placing less emphasis on earning great wealth or developing new products.

Cohort effects are statistically significant as well. Alumni graduating from 1992-1996 and 2002-2006 are significantly more likely to have a rural residence in 2007 than are alumni from the oldest cohort who graduated in the mid 1980s. Positive coefficients on all the cohort variables may imply that controlling for other factors, including age, interest in rural life is increasing over time. The trend is not linear, however, does reflect ups and downs in the farm economy. Certainly the farm crisis of the 1980s impacted graduates' options for rural living at that time. Relative to the farm crisis of the base period, 1982-1986, the farm economy and presumably rural economic opportunity has rebounded. Furthermore, the periods in which the cohort effects are significant correspond to sharp increases in net farm income. The increased probability of choosing a rural residence might therefore be cyclical and not trending.

Conclusions and Policy Implications

These data reveal a number of interesting patterns relevant for understanding which Land Grant graduates choose to locate in rural areas. First, it is noteworthy that most ISU alumni stay in, or relatively close to, Iowa. This certainly contradicts the perception perpetuated in

journalistic accounts that hordes Midwestern youth are moving to big cities like New York and Los Angeles. However, we do find strong evidence of brain drain from rural to urban counties. Seventy-five percent of rural-born alumni resided in urban counties in 2007.

There are a few strong predictors of which graduates choose to live in rural counties. The most likely rural alumni are rural born with degrees from the College of Agriculture. One note of caution here is that this finding may be unique to Land Grant Universities which attract a large number of rural-born students into their agricultural programs. Rural alumni place greater emphasis on non-pecuniary career goals than their urban counterparts. Another interesting implication of these data is that older alumni are somewhat more likely to live in rural counties, but not necessarily in the county in which they were raised. At the same time, interest in rural life appears to be increasing, at least conditional on the farm economy.

These data also show a large income gap between rural and urban alumni, which widens with experience and advanced degrees. Notably, the gap is fairly small for the most recent cohort of graduates and for fields in which rural labor demand is stronger, agriculture and human sciences.

When it comes to the problem of brain drain, virtually all the attention is paid to location decisions of young (i.e. 22 to 29 year old), college educated workers. Frequently the focus is even narrower, considering only science and technology graduates, presumably the next generation of professionals in the nation's high growth industries. As a result, brain drain policy solutions tend to be college scholarship programs aimed either at keeping resident students in state for school or bringing non-residents students in. The hope is that at least some of these students will choose to stay in the state after graduation. This policy strategy prevails despite the fact that existing research on the location choices of college graduates suggests the link between

the supply of and demand for college graduates within a state is relatively weak (Bound, et al, 2004; Groen, 2004). Focusing all brain drain policy on keeping students in state to attend college misses the point that if they do not find a commensurate way to make a living in the state upon graduating they will leave.

Policies aimed at improving individuals' opportunities, like scholarship programs, tend to increase geographic mobility, but this is not necessarily a bad thing. Our analysis suggests that given appropriate economic opportunities, whether working for someone else or creating one's own business, some college graduates are attracted to rural locations. Finding ways to foster economic and entrepreneurial opportunities for college graduates in rural communities could complement the current supply-oriented policies and ultimately lead to rural economic development. Not only did the alumni entrepreneurs in our survey create economic opportunities for themselves in rural counties, they provided more than 16,000 full time jobs for others as well. Recent research on rural business success finds that rural businesses have higher survival rates than similar urban firms (Yu, Orazem and Jolly, 2009). Successful promotion of rural entrepreneurship could trigger a virtuous cycle. As rural entrepreneurs achieve success, creating job opportunities and improving quality of life, fewer young educated people may be pushed to leave for urban areas, stemming future brain drain from rural to urban areas.

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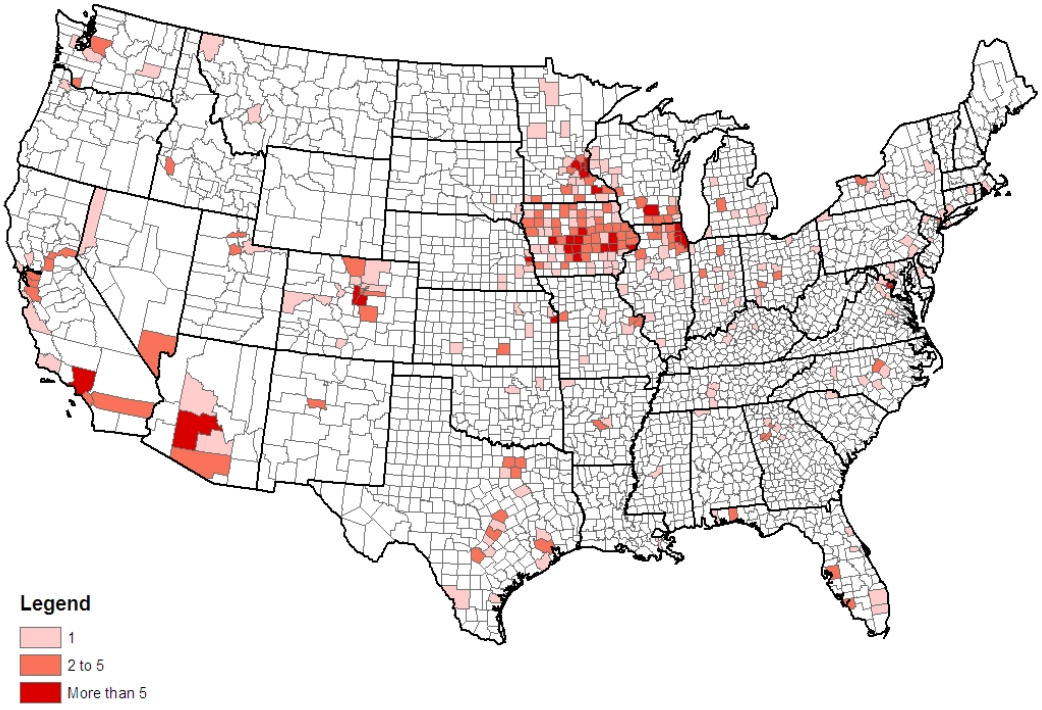

Figure 1. Respondents by Residence.

Table 1. Alumni Respondents By Origin and Current Residency

	Current Residency		
Origin	*Urban*	*Rural*	*Total*
Urban	68.86%	3.23%	72.10%
Rural	20.70%	7.20%	27.90%
Total	89.57%	10.43%	100.00%

Table 2. Percentage of rural origin and current rural residency by graduation years

Graduation years	**Origin**	**Residency**	**'Retention Rate'**
1982-1986	25.99%	9.98%	38.4
1987-1991	18.92%	8.49%	44.9
1992-1996	26.00%	11.18%	43.0
1997-2001	31.59%	8.77%	27.8
2002-2006	35.48%	12.98%	36.6

Table 3. Percentage of rural origin and current rural residency by colleges

College	**Rural Origin**	**Rural Residency**	**'Retention Rate'**
Agriculture & Life Sciences	44.80%	26.20%	58.48%
Business	26.68%	7.30%	27.36%
Design	18.15%	5.23%	28.82%
Engineering	21.24%	5.17%	24.34%
Human Sciences	29.96%	12.05%	40.22%
Liberal Arts & Sciences	25.49%	8.11%	31.82%

Table 4. Career Preferences of Rural and Urban Alumni

Career preference	Urban	Rural	Difference (Rural-Urban)
	Mean	Mean	t-value
Achieving a higher position for myself in society	2.989	2.946	-0.74
	(0.021)	(0.007)	
Having flexibility for my personal or family life	4.526	4.555	0.89
	(0.012)	(0.003)	
Being innovative and in the forefront of new technology	3.272	3.222	-0.98
	(0.019)	(0.006)	
Being respected by my friends	3.818	3.99	3.94***
	(0.017)	(0.004)	
Family tradition	1.81	2.216	6.56***
	(0.018)	(0.008)	
Having considerable freedom to adapt my own approach to work	3.929	4.024	2.41**
	(0.015)	(0.004)	
Greater financial security for myself, my spouse, and my children	4.406	4.408	0.07
	(0.013)	(0.003)	
Following the example of a person I admire	3.003	3.138	2.24**
	(0.020)	(0.008)	
Continuing to grow and learn as a person	4.438	4.435	-0.1
	(0.011)	(0.003)	
Building a business my children can inherit	1.752	2.128	6.52***
	(0.018)	(0.007)	
Earning a larger personal income	3.797	3.718	-1.56
	(0.017)	(0.006)	
Achieving something and getting recognition for it	3.478	3.358	-2.31**
	(0.018)	(0.006)	
Developing ideas for new products or new processes	3.132	2.897	-3.84***
	(0.020)	(0.008)	
Having a chance to earn great wealth or a very high income	3.106	2.937	-2.67***
	(0.021)	(0.008)	
Fulfilling a personal vision	3.758	3.861	2.05**
	(0.017)	(0.006)	
Leading and motivating others	3.797	3.794	-0.06
	(0.017)	(0.005)	
Having the power to greatly influence an organization	3.334	3.305	-0.53
	(0.019)	(0.006)	
Challenging myself	4.346	4.327	-0.54
	(0.012)	(0.003)	

Standard deviation in parentheses.; ***, **, * represent the significance at 1%, 5%, and 10% respectively

Table 5. Industries alumni have ever worked in by rural and urban residency

Industry	Urban	Rural	Difference (Rural-Urban)
Agriculture	10.30%	31.69%	9.59***
Arts, Entertainment, & Recreation	4.66%	3.11%	-1.62
Construction	8.62%	5.94%	-2.38**
Finance/Insurance	15.79%	12.28%	-2.06**
Hospitality	3.70%	4.63%	0.86
Manufacturing	17.54%	12.73%	-2.95***
Mining	0.27%	0.52%	0.86
Real Estate	2.66%	2.17%	-0.64
Social Services	4.10%	4.41%	0.29
Transportation & Utilities	7.25%	5.09%	-2.14***
Accommodation & Food Services	3.86%	6.01%	1.81*
Communications	6.28%	4.66%	-1.43
Education	19.97%	29.72%	4.20***
Government/Military	12.80%	13.03%	0.13
Legal	2.72%	2.28%	-0.53
Medicine/Health Care	13.25%	11.55%	-0.98
Non-profit	7.19%	8.39%	0.85
Retail	12.13%	11.96%	-0.1
Information Technology	13.26%	4.45%	-7.73***
Other	15.87%	11.36%	-2.72***

***, **, * represent the significance at 1%, 5%, and 10% respectively.

Table 6. Top five industries of ISU Alumni new businesses by business location

Urban	Rural
Information technology (13.08%)	Agriculture (33.22%)
Retail (12.48%)	Retail (11.31%)
Construction (8.81%)	Construction (9.43%)
Arts, entertainment & recreation (8.38%)	Information technology (4.48%)
Agriculture (7.93%)	Transportation (4.48%)

Table 7. Average income of rural and urban residents

Education	Urban	Rural	Urban Rural Income Ratio
Panel A: by education			
Bachelor	86,129.3	59,848.4	1.44
Master	106,806.9	60,979.9	1.75
Doctor	96,555.6	77,999.8	1.24
Professional degree	146,468.1	67,217.8	2.18
Panel B: by graduation years			
1982-1986	123,573.1	73,682.7	1.68
1987-1991	122,361.5	71,032.4	1.72
1992-1996	99,544.5	70,022.9	1.42
1997-2001	77,577.0	50,450.5	1.54
2002-2006	52,358.2	45,295.4	1.16
Panel C: by colleges			
Agriculture and Life	84,437.0	61,423.2	1.37
Business	104,491.5	70,178.8	1.49
Design	80,650.1	46,759.4	1.72
Engineering	120,974.6	78,903.9	1.53
Human Sciences	72,510.0	50,533.3	1.43
Liberal Arts & Science	90,827.9	57,376.3	1.58
Total	95,233.6	60,735.0	1.57

Note: Alumni who are student, retired, homemaker or unemployed are excluded. The education achievements are exclusive. Alumni who have multiple degrees will be counted into groups according to their highest degrees. Doctor's degree is regarded to be higher, than a master's degree. Professional degree is regarded to be terminal.

Table 8. Logit analysis – predicting the probability of rural residence in 2007.

Variables	Coefficient	t-value
Rural origin	1.708	13.94***
Male	-0.010	-0.07
Ethnicity	-0.791	-2.09**
Married	0.327	1.77*
Age	0.027	1.67*
Father's education	-0.125	-3.05***
Mother's education	0.028	0.59
Grew up in two parent's family	0.168	0.77
Number of siblings	0.031	1.03
Master degree	-0.167	-1.13
Doctor degree	-0.697	-1.94*
Professional degree	-0.459	-1.57
Total number of occupations since graduation	0.107	2.64***
College (with the base of College of Liberal Arts and Sciences)		
Agriculture & Life Sciences	0.917	5.09***
Business	-0.245	-1.16
Design	-0.455	-1.60
Engineering	-0.363	-1.74*
Human Sciences	0.220	1.13
Graduation Years (with the base of 1982-1986)		
1987-1991{0,1}	0.328	1.51
1992-1996{0,1}	0.626	2.74***
1997-2001{0,1}	0.382	1.28
2002-2006{0,1}	0.953	2.71***
Career Preference(1: Not at all important; 5: very important)		
Achieving a higher position for myself in society	-0.035	-0.58
Having flexibility for my personal or family life	-0.006	-0.06
Being innovative and in the forefront of new technology	0.015	0.21
Being respected by my friends	0.129	1.72*
Family tradition	0.097	1.57
Having considerable freedom to adapt my own approach to work	0.076	1.04
Greater financial security for myself, my spouse, and my children	0.090	0.90
Following the example of a person I admire	-0.074	-1.22
Continuing to grow and learn as a person	-0.065	-0.59
Building a business my children can inherit	0.197	3.16***
Earning a larger personal income	-0.007	-0.07
Achieving something and getting recognition for it	-0.045	-0.66
Developing ideas for new products or new processes	-0.170	-2.49**
Having a chance to earn great wealth or a very high income	-0.199	-2.71***
Fulfilling a personal vision	0.142	1.87*
Leading and motivating others	-0.001	-0.01
Having the power to greatly influence an organization	0.054	0.69
Challenging myself	-0.016	-0.14
Constant	-4.898	-4.62***
Observations	4871	
Wald χ^2	Wald $\chi^2(40)=516.65$	
Log pseudolikelihood	-1301.54	