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The Role of Migration

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Department of Agricultural Economics

Purdue University

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INDIANA'S HUMAN CAPITAL CHANGES: THE ROLE OF MIGRATION

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Abstract

The paper focuses on human capital gains and losses in the state of Indiana that are due to migration. Overall, Indiana's human capital gain is small and does not compare favorably that of other states. This is primarily due to Indiana not having been able to attract its fair share of the highly educated workers who are disproportionately attracted to coastal states. Without the influx of highly educated immigrants, Indiana would severely lose human capital. Moreover, young highly educated women are identified as playing a major role for Indiana's human capital accumulation.

Keywords: Migration, Education, Indiana

JEL classification: J61, R11

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Introduction

In the United States, as in all developed countries, the economy is increasingly dependent on a highly educated workforce (Houghton and Sheehan 2000). Not surprisingly, the percentage of college-educated Americans of age 25 years or older increased substantially over the last decades, from slightly more than 10 in 1970 to almost 30 percent in 2014 (US Census Bureau).

However, the college-educated population is not evenly distributed across the country. In Washington DC, for example, more than 50 percent of the residents have a college degree. Washington DC is followed by Massachusetts with almost 40 percent and Colorado with 38 percent. In Indiana, however, the highly educated population is underrepresented. Indiana's share of college-educated adults in Indiana has been persistently far below the national average (Waldorf 2006). The most recent figures suggest that this has not yet changed. In fact, with only 23.3 percent of the adult population having a college degree, Indiana ranks 44th among US states. Only a few southern states—Alabama, Louisiana, Kentucky, Arkansas, Mississippi—and West Virginia have even lower shares.

One way to improve its ranking is by attracting human capital from other states and from abroad. This article focuses on human capital gains and losses in Indiana that are due to migration. It begins by tracking the overall human capital gains and losses since 2005, followed by comparing Indiana's human capital gains and losses to those of other states. Finally, the article profiles those who leave Indiana and those who move to Indiana.

In the remainder of the article I only refer to the population from ages 25 to 65 years old, that is, working-age persons who have completed all or most of their education. I define the highly-educated population as being comprised of persons who have completed at least four years of college-education. Unless otherwise noted, the data uses information from the American Community Surveys 2005 to 2012 as compiled in the Integrated Public Use Microdata Series *IPUMS-USA* 2005 to 2012 (Ruggles et al. 2010).

The migration balance of Indiana's highly-educated population

During the 8-year period from 2004/05 to 2011/12, Indiana's migration balance for the college-educated population was positive. In total, 232,295 college-educated people moved to Indiana, and 221,027 left Indiana. This yields a net gain of 11,268 or 1,409 persons per year. This

very small increase corresponds to a gain of less than 0.2% of the highly educated population already living in Indiana.

Moreover, the net gain is likely to be even smaller than these figures suggest, since the US does not track movements out of the country. Thus, highly educated persons who left Indiana and moved abroad are not accounted whereas highly educated persons moving to Indiana from abroad are included.

A more nuanced look at migration in and out of Indiana shows that there are substantial differences between persons who have a 4-year college education (bachelor's degree), and those who have five or more years of college-education (master's, professional or doctoral degree). Figure 1 shows the migration in and out of Indiana for both groups since 2004/05.

The right side of Figure 1 shows the number of bachelor degree holders moving into and out of Indiana. Over the entire eight-year period, Indiana gained, on average, 1,719 bachelor degree holders per year, or less than 0.3% of the bachelor degree holders already residing in Indiana. The number of those leaving Indiana varied surprisingly little over the eight-year period. In contrast, the number of persons coming to Indiana seems to be more responsive to economic conditions, increasing up to the onset of the financial/economic crisis in 2007/08, and sharply declining thereafter. This decline is consistent with what has been termed the "great American migration slowdown" (Frey 2009). Very much to the disadvantage of Indiana, the outmigration of bachelor degree holders did not decline. By 2011, those who entered Indiana were severely outnumbered by those who left Indiana. One year later, however, the migration balance was again slightly positive.

The group of very highly educated persons (5 or more years of college, shown on the left side of Figure 1) has a small negative migration balance of minus 501 persons since 2005. The annual fluctuations over the eight-year period are quite substantial. In 2005, for example, Indiana had a net loss of 2,727 very highly educated persons. Three years later, Indiana recorded a net gain of 2,624 very highly educated persons. Although these fluctuations are substantial, but there is no clear and discernible pattern of the variations in the migration patterns of the very highly educated persons.

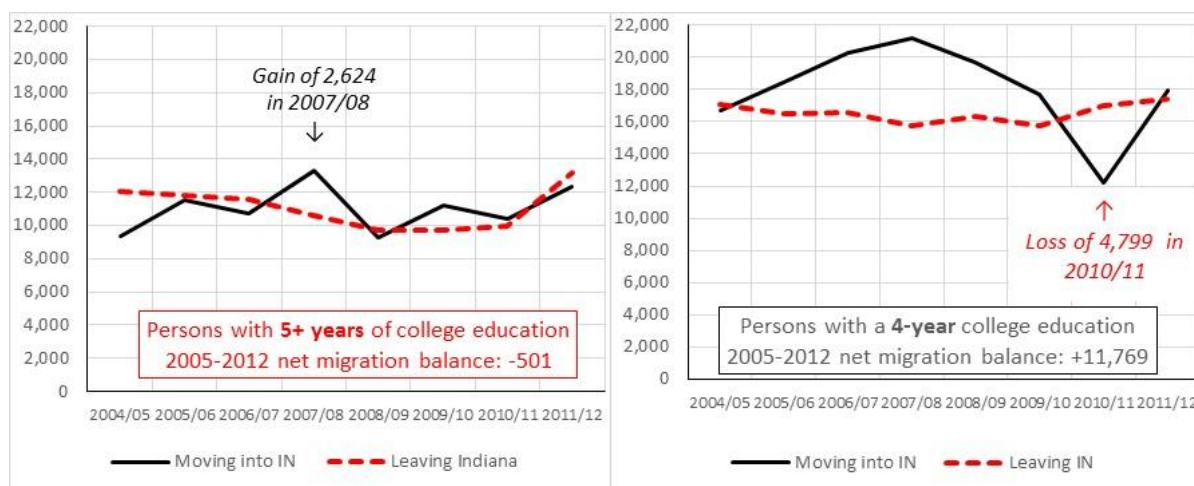


Figure 1: Migration in and out of Indiana, 2004/05 to 2010/11

How does Indiana's human capital gain compare to that of other states?

Indiana's gain of human capital through migration—on average 1,409 per year—is quite small compared to that of other states. In fact, Indiana ranks in the bottom 10 of all US states (plus DC). Table 1 shows the rankings of states by the average annual human capital gains during the 2005-2012 period, expressed as a percentage of the 2005 state populations with at least a 4-year college education. Indiana ranks in the bottom-10, suggesting that it excel neither in attracting nor in retaining human capital.

Table 1. Migration-induced Net Human Capital Gain, 2005 to 2012

Top 10			Bottom 10		
Rank	State	Net gain (%)	Rank	State	Net gain (%)
1	Arizona	2.31	42	Indiana	0.19
2	Washington	2.27	43	Wisconsin	0.14
3	Oregon	2.05	44	North Dakota	0.08
4	Nevada	2.00	45	Ohio	0.01
5	South Carolina	1.94	46	Wyoming	-0.16
6	Texas	1.93	47	Michigan	-0.26
7	Delaware	1.93	48	West Virginia	-0.26
8	DC	1.90	49	Mississippi	-0.30
9	North Carolina	1.82	50	Louisiana	-0.58
10	Florida	1.80	51	Alaska	-4.55

The top-four winners are western states, with Arizona having the largest net human capital gain: every year, Arizona's human capital grows by 2.31% relative to the 2005 human capital stock. High net gains are also recorded for Texas and states along the southeastern coast. At the bottom of the rankings are states with very small net gains (less than 0.2%)—Indiana, Wisconsin, North Dakota and Ohio—and states with net losses, including Wyoming, Michigan, West Virginia, Mississippi, Louisiana, and Alaska.

Indiana's Attraction Power

A state has a competitive edge if it can attract a disproportionately large share of all highly educated persons moving between states or entering the US from abroad. Since Indiana houses 2.1 percent of the entire US population, it needs to attract more than 2.1 percent of the highly-educated migrants to have such a competitive edge.

During the 8-year period from 2005 to 2012, the pool of highly educated persons moving between states or entering the US from abroad was comprised of 15.3 million persons. Indiana was only able to attract 1.5% of that pool, and thus far less than its "fair share." Quantifying the attraction power as the ratio of the share attracted and the fair share, Indiana's attraction power amounts to $1.5/2.1$ or 0.75. This ranks Indiana 45th in the nation.

Table 2 lists the states with the highest and lowest attraction power. Indiana shares its low rankings in the bottom-10 with its neighbors Kentucky, Ohio, and Michigan, and several southern states. In contrast, the states with high attraction power are located in the eastern and western portions of the US.

That the highly educated migrants avoid the Midwestern and southern states is not at all a surprising pattern. A good deal of studies have shown that human capital accumulation is a self-propelling process. That is, highly educated migrants have a preference to locate in places that already have a large share of highly-educated residents (Waldorf 2009, 2011, Whisler et al. 2008). For Indiana and other Midwestern states, this kind of sorting is quite worrisome: it explains Indiana's weak attraction of human capital but also implies that it will be quite difficult to strengthen Indiana's attraction power in the future.

Attempts to attract and retain human capital promise to be more effective when knowing the attributes of those highly-educated persons who move to Indiana, and stay in Indiana. The following section thus provides profiles of highly educated persons moving in and out of Indiana.

Table 2. Human Capital Attraction Power across States, 2005 to 2012

Top 10			Bottom 10		
Rank	State	Attraction Power	Rank	State	Attraction Power
1	DC	5.81	42	Alabama	0.75
2	Virginia	1.71	43	Oklahoma	0.74
3	Colorado	1.71	44	Kentucky	0.74
4	Hawaii	1.71	45	Indiana	0.72
5	Maryland	1.64	46	Wisconsin	0.70
6	Vermont	1.53	47	Ohio	0.65
7	Delaware	1.46	48	Louisiana	0.64
8	New Hampshire	1.46	49	Michigan	0.62
9	Alaska	1.46	50	Mississippi	0.60
10	Washington	1.44	51	West Virginia	0.56

Profiling Indiana's highly-educated movers

The most distinguishing characteristic of the highly educated movers is their young age (Franklin 2003). Indiana has more than three times more highly-educated movers between 25 and 45 years of age than between 45 and 65 years old. This is clearly due to there being more young than older highly- educated persons, but also due to younger people having an extremely high propensity to migrate. For example, each year there is a 10 percent chance that a 25-year old college-degree holder will move out of Indiana. For 35-year old persons, the chance is only 4 percent and, beyond age 50, the chance of moving out of Indiana drops to 2 percent or even less.

In addition to the dominance of young movers, the flows of highly-educated persons moving in and out of Indiana are also male-dominated. Figure 2 shows the age-sex composition of the highly educated movers into and out of Indiana. Overall, only 46% of the college educated migrants are women. However, among the younger migrants, women outnumber men, more so among migrants moving into Indiana than among migrants leaving Indiana. As women continue to outnumber men among new college entrants, it can be expected that the male dominance among migrants will turn into a female dominance in the near future.

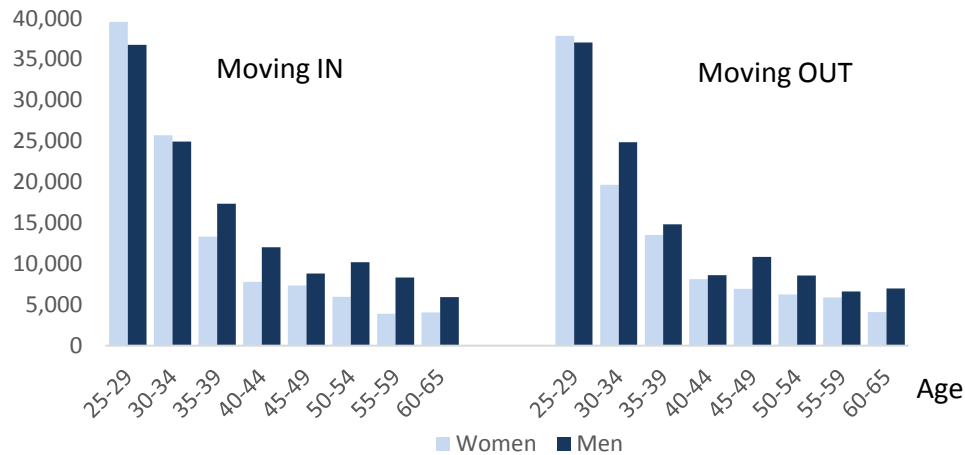


Figure 2: Age-sex Profile of Highly Educated Movers in and out of Indiana, 2005 to 2012

Interesting is also the composition by migrants' birth places. It suggests that foreign human capital plays a pivotal role for Indiana's human capital gains. Among the highly-educated persons moving into Indiana, almost a quarter (24.4%) were born abroad. India, China, Mexico, Korea, Canada and Japan lead the list of foreign birth places. Many of those born abroad, especially Koreans and Japanese, moved directly from their home country. Among those who leave Indiana, the recorded share of foreign born accounts for only 15 percent but may be higher when the unknown number of those leaving the US altogether is added.

Table 3. Migration-induced Net Human Capital Gains and Losses to other States, 2005-2012

Indiana lost human capital to:			Indiana gained human capital from:		
Rank	State	average annual loss	Rank	State	average annual gain
1	Florida	-681	1	Ohio	291
2	Texas	-540	2	Michigan	205
3	North Carolina	-466	3	California	200
4	Tennessee	-441	4	Louisiana	184
5	Massachusetts	-400	5	Maryland	125
6	Georgia	-342	6	Arkansas	119
7	Kentucky	-340	7	Wyoming	81
8	Minnesota	-320	8	Mississippi	64
9	Arizona	-267	9	Idaho	63
10	Washington	-227	10	West Virginia	56
Overall loss to other states		-5,657	Overall gain from other states		1,664

The importance of immigration for Indiana's human capital gain is also underscored by the fact that Indiana loses human capital due to domestic (interstate) migration. The net loss is not negligible, averaging 4,000 residents per year. Indiana loses to 29 states and the District of Columbia, with Florida, Texas, and North Carolina topping the list of states that gain human capital from Indiana. On the other hand, Indiana gains human capital from 20 states, including the two neighboring states Ohio and Michigan as well as from far away states along the coasts like California, Louisiana, and Maryland (see Table 3).

Finally, human capital moving in and out of Indiana is almost entirely a metropolitan affair (Waldorf 2008). Since 2005, 85% of the highly educated migrants moving into Indiana, chose to locate in a metropolitan area. And among the highly educated residents leaving Indiana, 90% originated from a metropolitan area.

Table 4. Average Annual Human Capital Gains and Losses, 2005-2012

Metropolitan Area	Moving In	Moving Out	Net Change
<i>Gaining Human Capital</i>			
1. Indianapolis	8,932	8,230	702
2. Louisville (IN portion)	908	591	317
3. Elkhart-Goshen	576	304	272
4. Bloomington	2,171	2,009	162
5. Kokomo	256	174	83
6. Lafayette-W. Lafayette	1,939	1,863	76
<i>Losing Human Capital</i>			
7. South Bend-Mishawaka	1,361	1,374	-12
8. Evansville (IN portion)	995	1,018	-23
9. Muncie	330	548	-219
10. Gary-Hammond-East Chi	2,186	2,499	-312
11. Fort Wayne	1152	1,516	-364
12. Terre Haute	224	804	-580

Table 4 shows the average annual number of highly educated migrants into and out of Indiana's metropolitan areas, ranked by their net gains/losses (last column). Indianapolis-Carmel is the metropolitan area with the biggest net gain of about 700 highly-educated residents per year, followed by the portion of the Louisville metro area that is located in Indiana. The two university metro-areas Bloomington and Lafayette have a high turnover of highly-educated residents, but the net gains are quite modest. Metro-areas specialized in manufacturing and transportation—for example, Terre Haute and Fort Wayne—lost human capital since 2005.

Conclusions

There are two strategies by which Indiana can increase its human capital stock. The first strategy is based on migration. Indiana will gain human capital if it can attract more highly educated persons moving into Indiana than the highly educated lost by moving out of Indiana. If successful, the migration-based strategy can be an instantaneous boost to the human capital stock. The second strategy focuses on growing Indiana's human capital stock by increasing high school graduation rates, college-entrance rates, college-graduation rates and retention rates. It is an expensive strategy and the benefits are not felt instantaneously. It also carries the risk that the investment will not pay off for Indiana. After all, upon graduation from college, the young graduates may choose to leave Indiana to take advantage of employment opportunities elsewhere.

This article documents that Indiana cannot solely rely on the migration-based strategy to increase its human capital stock. Migration of highly educated persons in and out of Indiana resulted only in a very small net gain of Indiana's human capital stock. Since 2005, Indiana gained on average 1,400 highly educated migrants per year. Among them, the young, male, and foreign-born are overrepresented. Moreover, the migration-induced human capital gains are concentrated in a few metropolitan areas, most notable the Indianapolis-Carmel metro area.

Of concern is that Indiana's small absolute human capital gain is actually a human capital loss relative to other states. Indiana is not competitive when it comes to attracting the highly educated, and would severely lose human capital if it were not for immigrants. In fact, almost 25 percent of the highly educated moving into Indiana were born outside the US, and without immigration, Indiana would lose 4,000 highly educated persons every year. The problem is that much of the foreign human

capital is young, highly mobile, and came to Indiana for additional education at Indiana's flagship universities.

From an economic development perspective, thus, a small human capital stock (Indiana ranks 44th in the nation) combined with a poor attraction power will make it quite challenging for Indiana to improve its relative standing through migration. A focus on the second strategy—improving education, keeping it affordable, and retaining the highly educated, domestic and foreign—promises to be more successful in the long run. Retaining the highly educated will ultimately determine to what extent the educational investment strategy will be beneficial for the state of Indiana.

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