Illinois Education Research Council

Bringing Research to Policy and Practice

Policy Research Report: IERC 2006-1

Estimating the Economic Impact of College Student Migration From Illinois

Executive Summary

Each fall, hundreds of thousands of new students enroll in college. They bring with them high aspirations and hopes for a future filled with the rewards of educational attainment. Amidst the individual stories of college transition is a story of the migration pattern of college students in the United States. The migration story is one in which some states send most of their best and brightest to in-state schools, while others send a larger portion out of state. A set of winning and losing states is created in the migration pattern and ensuing economic benefits that follow those workers that are highly educated.

The migration of college students is particularly relevant in Illinois, because the state exports many more high school graduates to colleges in other states than it imports. This migration pattern is important because college students who attend college in other states are far less likely to live and work in their home state after graduation. Thus, when Illinois loses a college student, its ability to build a competitive workforce (human capital) is diminished.

A clear picture of winners and losers emerges when we look at the migration and residency patterns of college-student migrants and graduates.

High exporting states: The long-term return on the earlier educational investment of individuals who attend college out of state is less likely to be seen by the state in the form of increased tax income or the social benefits of these citizens' community involvement. On the positive side, states that export high school graduates for college do not subsidize these students' in-state college education.

Low exporting states: States that are low exporters of college students are more likely to retain students as permanent residents and therefore experience the long-term economic benefits when these individuals continue to reside in their state.

High importing states: States that are high importers of college students experience short-term and long-term benefits of this migration pattern. First, out-of-state college students frequently pay a greater percentage of their college education costs, increasing the revenue of educational institutions. The state benefits from the permanent migration of about 20% of these individuals through not only the economic and social benefits experienced by college graduates, but also through being

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absolved of the costs of educating the individual in elementary and secondary school.

Low importing states: There is no benefit to being a low importer state.

Illinois Student Migration

States that export more college students than they import will fail to capture the economic and non-economic benefits of a highly educated society. Since as early as the 1960s, Illinois has been just such a state, ranking as the second highest net negative exporter (high exporter, low importer) of college students in the United States. During the 1990s, between 18,000 and 22,000 first-time, full-time college students from Illinois migrated annually to colleges in other states. While the state exports many students for college, it imports relatively few college students. Today, Illinois is one of only six states with net out-migration rates for college students and graduates.

Institutional Destination

Of the top 50 institutional destinations in Fall 2000, 29 are located in states adjacent to Illinois. Four institutions dominate, and three of them are public universities—the University of Iowa (1,098 Illinois students), Purdue University (728) and Indiana University (609)—while Marquette University is a private institution (534). It is interesting to note that 29% of the University of Iowa's freshman class is from Illinois, as is 32% of Marquette's freshman class. The most prominent type of college in the top 50 is the public research university—institutions with large enrollments and prominent athletic programs—often in surrounding Midwestern states.

Another type of institution also merits mention, although it is not represented among the top 50. In Fall 2000, 1,025 Illinois residents migrated to 68 Historically Black Colleges and Universities (HBCUs) (out of a total of 21,217 college student migrants).

State Destination

Three states each attract more than 2,000 Illinois freshmen (Indiana, Iowa and Wisconsin), and another two (Missouri and Michigan) enroll more than 1,000 each. Together, these states enroll almost half (48%) of Illinois' migrant college students.

Migration to private institutions outside of the immediate border states is largely concentrated in the Northeast and California, while migration to public institutions is more spread out, with Illinois residents attending public institutions in Colorado, Arizona, Kansas, and other Western and Southeastern states.

The net change in the stock of college graduates living in Illinois due to college student migration based on Fall 2000 migration is estimated to be -4,304.

Estimating the Economic Impact of Illinois Student Migration

In this study, we define "economic impact" of college student migration as the net long-term gain or loss of tax revenues to Illinois when college students leave the state and do not return to work in the state after graduation, off-set by the gain in tax revenues from in-migrants who stay in Illinois to work.*

College graduates can expect to earn more than $1.4 million over the course of their lifetimes than a high school graduate. Multiplying the estimated lost state income and sales tax revenues by the net number of lost graduates shows that Illinois will lose about $700 million in tax revenues over the lifetime of Fall 2000 college migrants.

Policy Considerations

State governments hope that the investments they make in education will not only serve to benefit the individual, but also society. In the modern economy where human capital is central to economic development, investments in education are investments in ensuring the state a highly skilled labor force. States that receive large numbers of college-student and college-graduate immigrants are going to be better prepared and more economically competitive than those states that lose college students. Conversely, states that lose large numbers of college students to other states may be less prepared for future economic growth, particularly if the students they lose tend to be their best and brightest.

The results of this study demonstrate that the state of Illinois experiences significant economic losses from college student migration. When a state such as Illinois loses a significant number of students through migration to attend out-of-state colleges, the state must hope to recoup its education investment in three ways: 1) return migration, 2) college student immigrants from other states, or 3) college graduate immigrants from other states. These efforts could focus on retaining college-bound students at in-state colleges and universities, attracting non-resident students, and creating a favorable environment for college graduate migrants.

Policy Consideration One: Mission Differentiation

Illinois could consider initiatives that aim to decrease the number of high school graduates leaving the state to attend college. A primary approach in this case is college and university mission differentiation. Loss of students to bordering public research universities suggests students from Illinois might be looking for a particular collegiate experience that is unavailable in their native state. Illinois also loses many students to selective, small liberal arts public institutions. Public universities in Illinois could differentiate their missions to better address the desires of students for either a public research university or a small public liberal arts institution. Migrants do not seem to be price sensitive, and Illinois could consider funding mission differentiation costs with higher tuition, while at the same time facilitating the enrollment of low-income students with need-based financial aid.

* The approached used in this study utilizes a method devised by Kangas (1996).

Policy Consideration Two: Incentives to Retain Students

Illinois could consider financial aid incentives, such as student-loan forgiveness programs, tuition tax credits, or even state-wide system reorganization for mission differentiation targeted at retaining the best and brightest Illinois high school graduates.

Policy Consideration Three: Incentives to Attract Students

Illinois imports a very low number of college students from other states. By attracting more out-of-state students, Illinois has the potential to increase the number of college graduates who live in the state at little to no cost. Tuition reciprocity agreements, while unlikely to decrease college student migration, could perhaps increase college student immigration. Mission differentiation can also be a specific strategy to attract out-of-state students into Illinois.

Policy Consideration Four: Incentives for College Graduates

Illinois could attempt to maximize its investment in education by providing incentives for college graduates to reside in Illinois.

Policy Consideration Five: Develop a Tracking System

A statewide system that tracks high school graduates, college enrollment, college graduation and post-college placement should be implemented as data systems are developed. Analysts could use data from such a system to inform the state with high precision as to the economic benefits of the educational investment being made by state government in higher education. Now, more than ever, there is a need to clearly and precisely articulate the benefits of investment in higher education.

Final Comment

What is clear from estimating the economic impact of student migration from Illinois is that state policies surrounding societal investments in education should consider the impact of migration on the pool of skilled and intellectual labor within its borders. As Mortensen (2002) states, "a priori, we would expect state economic welfare to be related to statewide measures of educational attainment of each state's adult population." Debates on the merits of investing in education must include discussions of the exceptional rate of return which education has had for economic growth and its prospects to best maximize investment into the future.

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Introduction

Each fall, hundreds of thousands of new students enroll in college. They bring with them high aspirations and hopes for a future filled with the rewards of educational attainment. Amidst the individual stories of college transition is a story of the migration pattern of college students in the United States. The migration story is one in which some states send most of their best and brightest to in-state schools, while others send a larger portion out of state. A set of winning and losing states is created in the migration pattern and ensuing economic benefits that follow those workers that are highly educated.

The migration of college students is particularly relevant in Illinois, because the state exports many more high school graduates to colleges in other states than it imports. This migration pattern is important because college students who attend college in other states are far less likely to live and work in their home state after graduation. Thus, when Illinois loses a college student, its ability to build a competitive workforce (human capital) is diminished.

Human capital is an economic term referring to the skilled labor of individuals developed through investments to education. The loss of human capital can be directly quantified as lost tax revenues.[1] This paper addresses the following issues:

- Why human capital is important to state economic vitality
- Why the migration of college students is an important policy issue
- How college-student migration plays out in Illinois
- The total estimated economic impact—defined here as lost state taxes—of the out-of-state migration of Illinois high school graduates for college

Conceptualizing the Economics of College-Student Migration

Human Capital and State Economic Interests

In the modern economy, prosperity is facilitated by growth and development largely based on the skill and knowledge of workers, or human capital. While the wealth of states once depended upon physical capital—operationalized in manufacturing and agriculture—today's economy is more reliant on information and services. Investments made in education are one of the central ways that states engage in the development of the human capital needed for a 21st century economy.

The rate of return for state investments in education is about 13%.

Research demonstrates that funding for education is the most equitable and efficient method for developing human capital. The rate of return, or funds returned to

[1] Human capital losses also have an impact on the ability of states and localities to attract businesses that are seeking a well-educated workforce. As the economy moves from a reliance on industrial production to a reliance on services and technology, the importance of a college-educated workforce becomes even more important. In this paper, we do not attempt to estimate the impact of these losses to Illinois, even though they could, in fact, exceed the tax-revenue losses that we calculate here.

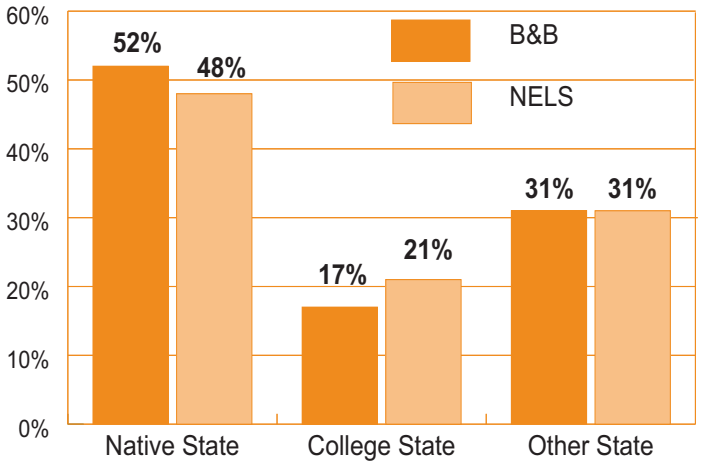
the state for their investment in education, is around 13% each year—outpacing, for example, the historical 7% return on investments in the stock market in the United States (Siegel, 1998).

A variety of social and economic benefits are associated with higher education, including increased earnings, higher civic engagement, and less reliance on costly state programs, such as correctional facilities and public aid. Prominent for states considering investments in education is that increased personal income for college-educated professionals translates into increased tax revenue for the state. It is estimated that a college-educated individual will, on average, earn 1.4 million more dollars in their lifetime than a non-college educated individual. This increased income translates into both increased income- and sales-tax revenue. This tax revenue increases states' abilities to support their infrastructures—including roads, education, health care and public safety. Thus, a state benefits economically from the human capital of a highly educated work force.

In-State and Out-Of-State Enrollment for College

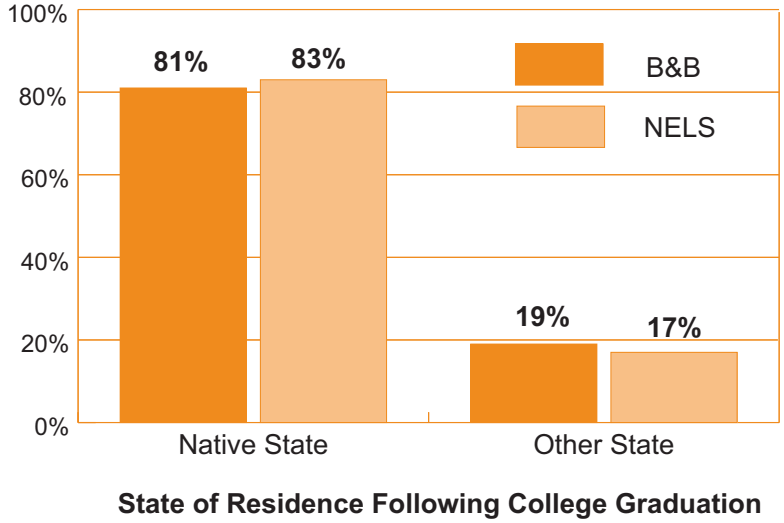
As policymakers become increasingly concerned with returns on investments made in education, college student migration patterns also become an important policy consideration for a state. Migration matters because students who enroll out-of-state for college are far less likely than those who remain in state for college to make their permanent professional home in the state where they graduated from high school. About 50% of individuals who migrate to another state for college will reside in their home state upon graduation, compared to about 80% of those graduating from college in state (Adelman, 2004; Perry, 2001). Additionally, about 20% of students who migrate to another state to attend college will establish residency in that state upon graduation. Figures 1 and 2 use national data from the Baccalaureate and Beyond (B&B) and National Education Longitudinal Study (NELS) surveys to show the migration and residency patterns of college student migrants and graduates.

Figure 1.
Where Students Who Attend Out-of-State Colleges Live After College Graduation[2]



[2] Adapted from Adelman (2004) and Perry (2001).

Figure 2.
Where Students Who Attend In-State Colleges Live After College Graduation[3]



State-to-State Migration for College as a Policy Issue

A clear picture of winners and losers emerges when we look at the migration and residency patterns of college-student migrants and graduates.

High exporting states: The long-term return on the educational investment of individuals who attend college out of state is less likely to be seen by the state in the form of increased tax income or the social benefits of these citizens' community involvement. On the positive side, states that export high school graduates for college do not subsidize these students' in-state college education.

Low exporting states: States that are low exporters of college students are more likely to retain students as permanent residents and therefore experience the long-term economic benefits when these individuals continue to reside in their state.

High importing states: States that are high importers of college students experience short-term and long-term benefits of this migration pattern. First, out-of-state college students frequently pay a greater percentage of their college education costs, increasing the revenue of educational institutions. Second, approximately 20% of out-of-state college students can be expected to become permanent residents of the state. The state benefits from the permanent migration of these individuals through not only the economic and social benefits experienced by college graduates, but also through being absolved of the costs of educating the individual in elementary and secondary school.

Low importing states: There is no benefit to being a low importer state.

[3] Adapted from Adelman (2004) and Perry(2001).

States that export more college students than they import will fail to capture the economic and non-economic benefits of a highly educated society.

Combining exportation and importation levels creates a matrix that portrays the risks and benefits experienced by different state migration trends (Figure 3). States that export more college students than they import will fail to capture the economic and non-economic benefits of a highly educated society.

- States that are ***high exporters and importers of students (Box 1)*** experience a strong short term benefit because they do not provide a state-subsidized college education for a higher proportion of its own residents, while out-of-state students pay out-of-state tuition for their college education. However, they are not maximizing the earlier investment made to educate students who leave the state for college, and have fewer college-graduated residents in the long run.

- States that are ***low exporters and high importers of students (Box 2)*** appear to optimize the short- and long-term benefits of migration patterns. Having imported students pay greater portions of their college education costs (about 20% of whom will remain in state after graduation), while also retaining in-state students (about 80% of whom likely to be long term residents), leads to increased tax revenue and lower social costs to the state.

- On the flip side, ***those states that are high exporters and low importers (Box 3)*** are unlikely to maximize either their short- or long-term educational investment. With primarily in-state students in their colleges and universities, the state is investing heavily in their in-state students, without experiencing the benefit to their colleges and universities of out-of-state tuition-paying students. With a large number of students departing the state for college, it is likely that only half of these students will return to add their human capital to their home state labor force.

- Those states with ***low import and export of students (Box 4)*** are likely to retain the long term benefits of their investment in student education, but simultaneously the state bears the burden of subsidizing the college education cost of a primarily in-state college population.

Figure 3.
Typology of the Potential Economic Impact of College Student Migration

	High Exporter	Low Exporter
High Importer	Box 1 Students lost to migration are replaced by imported students. ***Short-term benefit:*** imported college students pay more of their college costs. ***Long-term harm:*** exported and imported students are less likely to stay as permanent residents.	Box 2 Students lost to migration are more than replaced by imported students. ***Short-term benefit:*** imported students pay more of their college costs. ***Long-term benefit:*** state is likely to gain well-educated individuals as permanent residents. **Optimal for maximizing educational investment.**
Low Importer	Box 3 State loses significant number of students. ***Short-term benefit:*** little benefit in imported students paying greater portion of college costs. ***Long-term harm:*** permanent loss of exported students as skilled workforce. **Worst case for maximizing educational investments in human capital.**	Box 4 Little student movement from state to state. ***Short-term benefit:*** Little capitalization on imported students. ***Long-term benefit:*** Post graduation, a high percentage of students can be expected to remain as permanent residents, maximizing investment in education.

Illinois Student Migration

Since as early as the 1960s, Illinois has been the second highest net negative exporter (high exporter, low importer) of college students in the United States (American Association of Collegiate Registars & Admissions Officers, 1960). During the 1990s, between 18,000 and 22,000 first-time, full-time college students from Illinois migrated annually to colleges in other states (Smith & Wall, 2004). While the state exports many students for college, it imports relatively few college students (see Table 1). Today, Illinois is one of only six states with net out-migration rates for college students and graduates (Presley, 2003).

Nearly 50% of all Illinois college-student migrants enroll at four-year public colleges and universities, much higher than the national average of about 33% (NCES, 2004). The remainder enroll in private institutions, two-year colleges, or for-profit institutions. Fall 2000 college-student migration rates are shown in Table 1.[4] Why Illinois students disproportionately enroll in out-of-state public colleges and universities is a question for further analysis, but identification of this pattern points to how Illinois may be losing important human capital.

[4] Some out-migrating Illinois students may subsequently transfer into an in-state institution. The IERC's study of the Class of 2002 shows that the net in- and out-migration of Illinois residents after they start college is balanced (Gong & Presley, (2006) forthcoming). So for analysis purposes, it is satisfactory to treat first-year enrollments as capturing the pattern of migration for Illinois residents.

Table 1.
Illinois Migration of College Students by Sector, Fall 2000

Institutional Type	Number of Institutions	Number of Students Migrating Into and Out of Illinois		
		Migration Out	Migration In	Net Migration
4-Year Private	632	8,913	6,164	-2,749
4-Year Public	337	9,180	1,221	-7,959
2-Year Private	23	288	15	-273
2-Year Public	184	1,494	855	-639
For-Profit	148	1,342	1,148	-194
Total	1,324	21,217	9,403	-11,814

Source: Integrated Postsecondary Education Data System (IPEDS).
Note. Migration of first-time, first-year college students only.

Four institutions dominate, and three of them are public universities—the University of Iowa (1,098); Purdue University (728); Indiana University (609); Marquette University (a private institution, 534); and the University of Wisconsin-Madison (527).

Table 2 shows the top 50 institutional destinations for Illinois college-student migrants. Thirty (30) are located in states adjacent to Illinois. Five institutions dominate, and four of them are public universities—the University of Iowa (1,098), Purdue University (728), Indiana University (609), Marquette University (a private institution, 534) and the University of Wisconsin-Madison (527). It is interesting to note that 29% of the University of Iowa's freshman class is from Illinois, as is 32% of Marquette's freshman class.*

The most prominent type of college in the top 50 is the public research university—with large enrollments and prominent athletic programs—often in surrounding Midwestern states.

The most prominent type of college in the top 50 is the public research university—institutions with large enrollments and prominent athletic programs—often in surrounding Midwestern states. This type of institution enrolled 26% of Illinois four-year migrants in Fall 2000. Other public institutions in the top 50 are small Midwestern liberal arts institutions like Truman State, Miami, Ball State, Northern Michigan, Murray State, and Grand Valley State Universities.*

Illinois migrants generally attend three types of private institutions. The first type is border private institutions where enrollment is largely local. Another type of institution is the selective private institution that is also close to the Illinois border, but whose enrollment is nationally based. The third type of institution is the selective, private liberal arts institution whose enrollment base is likely to be regional.

Another type of institution also merits mention, although none are represented among the top 50. In Fall 2000, 1,025 Illinois residents migrated to 68 Historically Black Colleges and Universities (HBCUs) out of a total of 21,217 college student migrants (data not shown). The states that received the most Illinois migrants attending HBCUs were Mississippi (166), Alabama (122), Georgia (114), Tennessee (99), and Louisiana (95).

**Text corrected November 7, 2006.*

Table 2.
Top 50 Four-Year Institutional Destinations for Illinois College Student Migrants, Fall 2000*

Institution	Location	Sector	# IL Residents Enrolling	% of Total First Year Students Who Are Illinois Residents
University of Iowa	Iowa City, IA	Public	1,098	29%
Purdue University	West Lafayette, IN	Public	728	11%
Indiana University	Bloomington, IN	Public	609	9%
Marquette University	Milwaukee, WI	Private	534	32%
University of Wisconsin	Madison, WI	Public	527	9%
St. Louis University	St. Louis, MO	Private	322	23%
Iowa State University	Ames, IA	Public	312	7%
University of Missouri	Columbia, MO	Public	272	6%
University of Michigan	Ann Arbor, MI	Public	244	5%
Carthage College	Kenosha, WI	Private	241	47%
Arizona State University	Tempe, AZ	Public	214	4%
University of Notre Dame	Notre Dame, IN	Private	201	10%
Miami University	Oxford, OH	Public	195	6%
Valparaiso University	Valparaiso, IN	Private	194	26%
University of Kansas	Lawrence, KS	Public	189	4%
University of Colorado	Boulder, CO	Public	187	4%
Western Michigan University	Kalamazoo, MI	Public	186	4%
Michigan State University	East Lansing, MI	Public	178	3%
Washington University	St. Louis, MO	Private	177	12%
Truman State University	Kirksville, MO	Public	176	13%
St. Ambrose University	Davenport, IA	Private	154	42%
Southeast Missouri State University	Cape Girardeau, MO	Public	153	10%
University of Dayton	Dayton, OH	Private	150	8%
Loras College	Dubuque, IA	Private	146	38%
Northern Michigan University	Marquette, MI	Public	135	8%
University of Arizona	Tucson, AZ	Public	128	2%
University of Wisconsin	Whitewater, WI	Public	124	6%
Butler University	Indianpolis, IN	Private	123	14%
St. Norbert College	De Pere, WI	Private	123	22%
Winona State University	Winona, MN	Private	117	8%
Murray State University	Murray, KY	Public	106	8%
Drake University	Des Moines, IA	Private	99	16%
Ball State University	Muncie, IN	Public	96	3%
Indiana State University	Terre Haute, IN	Public	91	4%
Ohio State University	Columbus, OH	Public	88	2%
Milwaukee School of Engineering	Milwaukee, WI	Private	88	17%
Taylor University	Upland, IN	Private	83	17%
Calvin College	Grand Rapids, MI	Private	79	8%
New York University	New York, NY	Private	79	2%
Vanderbilt University	Nashville, TN	Private	79	5%
Howard University	Washington, DC	Private	75	5%
Carroll College	Waukesha, WI	Private	75	15%
Grand Valley State University	Allendale, MN	Public	72	3%
Beloit College	Beloit, WI	Private	72	24%
Boston University	Boston, MA	Private	70	2%
St. Louis College of Pharmacy	St. Louis, MO	Private	70	48%
University of Wisconsin	Parkside, WI	Public	67	8%
University of Southern California	Los Angeles, CA	Private	66	2%
Clark Atlanta University	Atlanta, GA	Private	66	6%
Culver Stockton College	Canton, MO	Private	66	31%

Note:

Enrollment refers to first-time, first-year students from Illinois.

**Text corrected November 7, 2006.*

Three states each attract more than 2,000 Illinois students (Indiana, Iowa and Wisconsin), and another two (Missouri and Michigan) enroll more than 1,000 each. Together, these states enroll almost half (48%) of Illinois' migrant college students.

While college student migration rates by institution are interesting, it is also useful to know to which states students migrate. Table 3 shows the top 18 states to which Illinois college students migrate. Three states each attract more than 2,000 Illinois students (Indiana, Iowa and Wisconsin), and another two (Missouri and Michigan) enroll more than 1,000 each. Together, these states enroll almost half (48%) of Illinois' migrant college students. Illinois exports more college students than it imports to all but three states (California (+115), Texas (+89) and Maryland (+37)).

Iowa, Indiana, Michigan, Colorado, Arizona, Kentucky, and Kansas import more Illinois residents into their public sector than their private sector. On the other hand, among the top 18 states, Wisconsin, Missouri, New York, Massachusetts, Florida, Minnesota, Pennsylvania, and California import relatively more Illinois residents into their four-year private sector.

Several patterns emerge when we look at the geography of migration. Migration to private institutions outside of the immediate border states is largely concentrated in the Northeast and California, while migration to public institutions is more spread out, with Illinois residents attending public institutions in Colorado, Arizona, Kansas, and other Western and Southeastern states.

Table 3.
In- and Out-Migration of College Students To and From Top 18 States, and by Sector, Fall 2000

State	All Four-Year			Four-Year Public			Four-Year Private		
	Out	In	Net	Out	In	Net	Out	In	Net
Indiana	2,680	642	-2,038	1,619	51	-1,568	1,061	591	-470
Iowa	2,330	319	-2,011	1,461	88	-1,373	869	231	-638
Wisconsin	2,280	526	-1,754	881	64	-817	1,399	462	-937
Missouri	1,734	735	-999	794	295	-499	940	440	-500
Michigan	1,206	599	-607	921	36	-885	285	563	278
Ohio	826	502	-324	402	68	-334	424	434	10
New York	546	341	-205	95	33	-62	451	308	-143
Colorado	462	145	-317	357	12	-345	105	133	28
Minnesota	456	315	-141	185	29	-156	271	286	15
Massachusetts	431	145	-286	13	13	0	418	132	-286
Florida	418	281	-137	168	54	-114	250	227	-23
Arizona	379	77	-302	372	13	-359	7	64	57
California	365	480	115	95	75	-20	270	405	135
Tennessee	336	95	-241	114	21	-93	222	74	-148
Pennsylvania	268	196	-72	52	20	-32	216	176	-40
Kentucky	249	120	-129	205	24	-181	44	96	52
Georgia	238	86	-152	42	16	-26	196	70	-126
Kansas	228	104	-124	209	21	-188	19	83	64

Estimating the Economic Impact of Illinois Student Migration

Following an approach devised by Kangas (1996), we define "economic impact" as the net long-term gain or loss of tax revenues to Illinois when college students leave the state and do not return to work in the state after graduation, off-set by the gain in tax revenues from in-migrants who stay in Illinois to work. We start by estimating the numbers of out-migrants and in-migrants who return or remain in Illinois after college (Table 4). We then calculate the increase in income that college graduates can expect to earn over their lifetime, in comparison to high school graduates (Table 5). Finally, we estimate the net long-term loss of tax revenues to Illinois related to the net loss to Illinois' stock of college graduates (Table 6).

Step 1: Estimating the change in the net annual stock of Illinois college graduates due to migration for college (Table 4). 18,093 students left Illinois for college in 2000. The IERC is following the Illinois Class of 2002, and has found that by the third year of enrollment, 90% of starters in four-year institutions, both in-state and out-of-state are still enrolled somewhere. We, therefore, discount student migration by 10% to account for this leakage in the pipeline.

Nationally, about 48% of college student migrants return to their native state following graduation from an out-of-state college (Adelman, 2004). Thus, we estimate that 7,816 college student out-migrants from Illinois in Fall 2000 will return to Illinois with a degree and establish residency. If they had stayed in state for college, about 83% of students would remain in state after graduation (Perry, 2001). So we could have expected 13,516 of the 16,284 graduates who actually went out-of-state to have remained in Illinois after college if they had instead enrolled in state. The difference between the estimated number of college student migrants who return to Illinois following graduation and the number who would have resided in Illinois had they attended an in-state college is estimated to be –5,700 annually. We finally discount this number by the 21% of the 7,385 college students who migrated into Illinois for college and can be expected to gain a degree and remain,

Table 4.
Estimated Stock of College Graduates Living in Illinois Due to College Student Migration in Fall 2000

	# of Migrants
Actual number of college students leaving Illinois	18,093
Estimated number completing a bachelor's degree	16,284
Estimated number who will return to Illinois following graduation	7,816
Estimated number of migrants who would have resided in Illinois had they attended an Illinois institution	13,516
Net loss due to college student migration	-5,700
Estimated number of out-of-state college residents who attended Illinois institutions and will continue residency in Illinois following graduation	1,396
Net annual stock of college graduates living in Illinois due to college student migration	-4,304

or 1,396 college graduates (Perry, 2001). The net change in the stock of college graduates living in Illinois due to college student migration is -4,304.

College graduates can expect to earn more than $1.4 million more over the course of their lifetimes than a high school graduate.

Step 2: The Annual Income Premium for College Graduates (Table 5). College graduates have higher earnings than high school graduates. We call this difference the "Net Educational Premium" (NEP). Average income by age and education level is shown in Table 5 (U.S. Census Bureau, 2004). College graduates can expect to earn more than $1.4 million more over the course of their lifetimes than a high school graduate.

Table 5.
Net Educational Premium, 2000

Age	High School Graduate	College Graduate	Annual Premium	Cumulative Premium
18–21	$14,824	$0	-$14,824	-$59,296
22–24	14,824	23,930	9,106	27,318
25–29	23,329	39,649	16,320	81,600
30–34	26,669	49,217	22,548	112,740
35–39	28,138	61,745	33,607	168,035
40–44	29,806	62,922	33,116	165,580
45–49	30,357	64,577	34,220	171,100
50–54	30,399	62,592	32,193	160,965
55–59	30,953	67,728	36,775	183,875
60–64	27,531	62,936	35,405	177,025
65–69	19,241	48,815	29,574	147,870
70–74	16,947	40,110	23,163	115,815
Total				**$1,452.627**

Step 3: Estimating the economic impact (tax-revenue loss) on Illinois of college student migration (Table 6). Illinois loses not only state income taxes when college graduates locate out of state, but it also loses the state income taxes on those who would have been employed in the state to support the increased consumption of these people. In addition it loses state sales tax on commodities that these graduates would have generated if they had been state residents.

- ***Table 6, Row 1.*** We begin this estimate of lost tax revenues with the Net Educational Premium—the amount of additional income accruing to college graduates over their lifetimes—that we obtained in Step 2. The state loses income tax of 3% on this additional income per graduate.
- ***Table 6, Row 2.*** The state also loses income tax from the people who would have been employed to provide services and commodities to these graduates —the induced state income tax. This is a more complicated estimation that requires us first to calculate the multiplier effect that occurs when spending in one area or sector results in increased income and consumption in others, and then estimate the lost income taxes that suppliers would have paid to the

state on the income they earned as a result of spending by college graduates. Our calculations are described in more detail in Footnote 5.[5] As Des Jardins (2003) notes, however, "not all of the educational premium is available for spending." Generally, about 70% of income is available for consumption (Des Jardins, 2003, Kangas, 1996). Multiplying the net multiplier effect of $1,844,836 by 70% results in a total of $1,291,385 in labor contributed to the economy. If the state collects 3% of that in income taxes, the state would collect $38,742 in additional income taxes from those whose jobs are generated by the increase in demand.

- ***Table 6, Row 3.*** We also consider sales tax and marginal propensity to consume (MPC) when determining the economic impact of a college degree. The rationale for including sales tax is that individuals are not only taxed on their income, but also on things they buy. We use a 5% sales tax, and an estimated 50% of available income going to buy goods that carry a sales tax (Des Jardins, 2003, Kangas, 1996). The state of Illinois can expect to lose $164,758 in lifetime tax revenues per each individual who migrates to a four-year public or private college or university and does not return to Illinois. This amount is also, of course, the estimated amount the state stands to gain for each college student migrant who returns to Illinois following graduation.

Illinois will lose an estimated $700 million in tax revenues over the lifetime of Fall 2000 college migrants.

We have shown earlier that Illinois loses an estimated net of 4,304 college graduate residents annually due to college student migration. Multiplying the estimated lost state income and sales tax revenues by the number of lost graduates shows that Illinois will lose about $700 million ($709,118,432) over the lifetime of Fall 2000 college migrants.

[5] The multiplier effect occurs when spending in one area or sector results in increased income and consumption in others. For instance, when additional income earned by a college graduate is spent, suppliers of products and services use the income for capital and operating expenditures. The suppliers then pay additional taxes to the state on the income they earned as a result of spending by college graduates. In 1996 the multiplier effect for Illinois in the service sector was estimated to be 2.27 (Kangas, 1996). Multiplying this by the lifetime net education premium of a college degree ($1,452,627), would result in $3,297,463 in indirect benefits to the Illinois economy for each college graduate. In our calculations, we then subtract the net educational premium from that total, since we have already calculated the state income taxes on that amount in the first row. Hence the net multiplier effect caused by the additional consumption of college graduates is an additional $1,844,836 per college graduate.

Table 6.
Estimated Per Student Economic Impact (Tax-Revenue Loss) of College Student Migration on the State of Illinois

Tax Impact	Amount	Base for Calculation	Explanation
State income taxes from college graduate not in state	-$43,579	3% of NEP of $1,452,627	The state loses income taxes on the lost income premium of college graduates who did not reside in state.
Induced state income taxes	-$38,742	Multiplier Effect of 2.27 * NET = $3,297,463 minus NEP already included in row 1 = $1,844,836 * 70% * 3%	The state loses income taxes on the salaries of people who would have been needed to support the consumption of college graduates if they had remained in state.
State sales taxes	-$82,437	50% of Multiplier Effect * state sales tax of 5%	Tax on items people purchase that carry a sales tax.
Total tax impact per graduate lost	-$164,758	Sum of rows above	The amount of tax revenues the state loses over the lifetime of each lost college graduate.

Discussion of Implications

State governments hope that the investments they make in education will not only serve to benefit the individual, but also society. In the modern economy where human capital is central to economic development, investments in education are investments in ensuring the state has a highly skilled labor force. States that receive large numbers of college-student and college-graduate immigrants are going to be better prepared and more economically competitive than those states that lose college students. Conversely, states that lose large numbers of college students to other states may be less prepared for future economic growth, particularly if the students they lose tend to be their best and brightest.

The state of Illinois experiences significant economic losses from college student migration.

The results of this study suggest that the state of Illinois experiences significant economic losses from college student migration. This research also suggests that Illinois should take proactive steps to address the issue of college student migration. When a state such as Illinois loses a significant number of students through migration to attend out-of-state colleges, the state must hope to recoup its education investment in three ways: 1) return migration, 2) college student immigrants from other states, or 3) college graduate immigrants from other states. These efforts could focus on retaining college-bound students at in-state colleges and universities, attracting non-resident students, and creating a favorable environment for college graduate migrants.

Policy Consideration One: Mission Differentiation

The state must hope to recoup its education investment in three ways: 1) return migration, 2) college student immigrants from other states, or 3) college graduate immigrants from other states.

Illinois could consider initiatives that aim to decrease the number of high school graduates leaving the state to attend college. A primary approach in this case is college and university mission differentiation. Illinois loses many college student migrants to large, public, flagship universities in bordering states. In fact, nearly 4,700, or 25% of all four-year migrants in Fall 2000, attended public research institutions with large enrollments. Loss of students to bordering public research universities suggests students from Illinois might be looking for a particular collegiate experience unavailable in their native state. Illinois also loses many students to selective, small liberal arts public institutions. In Fall 2000, over 800 Illinois students migrated to the institutions of Miami in Ohio, Ball State in Indiana, Northern Michigan, Truman State in Missouri, Winona in Minnesota, and Murray State in Kentucky. Public universities in Illinois could differentiate their missions to better address the desires of students for either a public research university or a small public liberal arts institution. Since college student migrants from Illinois attend college at public institutions out of state and pay out-of-state tuition rates, migrants do not seem to be price sensitive. Illinois could consider funding mission differentiation costs with higher tuition, while at the same time facilitating the enrollment of low-income students with need-based financial aid.

Policy Consideration Two: Incentives to Retain Students

A second policy option for stemming the tide of students exported from Illinois would be to consider financial aid incentives, student-loan forgiveness programs, tuition tax credits, or even state-wide system reorganization for mission differentiation targeted at retaining the best and brightest Illinois high school graduates. Recommendations as to which approach would be attractive to high school graduates who are considering college attendance out of state is an area of further study, but clearly some incentive structures could be put in place to retain the students with the highest human capital potential.

Policy Consideration Three: Incentives to Attract Students

Illinois imports a very low number of college students from other states. By attracting more out-of-state students, Illinois has the potential to increase the number of college graduates who live in the state at little to no cost. Several states have or are planning policies aimed at increasing the number of non-resident college students in their state. Tuition reciprocity agreements, while unlikely to decrease college student migration, could perhaps increase college student immigration. Mission differentiation can also be a specific strategy to attract out-of-state students into Illinois.

Policy Consideration Four: Incentives for College Graduates

Illinois could attempt to maximize its investment in education by providing incentives for college graduates to reside in Illinois. Many states have developed programs aimed specifically at recruiting college graduates.[6] While it is economically

[6] Bradley University and the city of Peoria, Illinois created an Engineers for Tomorrow program that aims to provide opportunities for local students and incentives for continued residency in the region after graduation (Brown, 2003). Students are responsible for only one-third of their costs, with local businesses and participating communities and Bradley University subsidizing the other two-thirds (Brown, 2003). *(continued on page 18)*

efficient to attract out-of-state college graduates, because Illinois has no up front college education costs but receives all the benefits, this approach is risky because it is harder to attract graduates in to the state than it is to keep native students after graduation.

Policy Consideration Five: Develop a Tracking System

This study employed data from the Integrated Postsecondary Education Data System (NCES, 2004) in order to examine migration related to the state of Illinois. While this is a viable means of on-going data collection and analysis, a statewide system that tracks high school graduates, college enrollment, college graduation and post-college placement should be implemented as data systems are developed. Analysts could use data from such a system to inform the state with high precision as to the economic benefits of the educational investment being made by state government in higher education. There is a need to clearly and precisely articulate the benefits of investment in higher education.[7]

Final Comment

What is clear from estimating the economic impact of student migration from Illinois is that state policies surrounding societal investments in education should consider the impact of migration on the pool of skilled and intellectual labor within its borders. As Mortensen (2002) states, "a priori, we would expect state economic welfare to be related to statewide measures of educational attainment of each state's adult population." Debates on the merits of investing in education must include discussions of the exceptional rate of return which education has had for economic growth and its prospects to best maximize investment into the future.

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[6] *(continued)* The Northeast Ohio Council on Higher Education (2005), a consortium of 15 public and private four-year and two-year institutions developed an Enroll, Engage, and Employ program for the purpose of explicitly linking students with community development and companies throughout the region. The State of Iowa initiated a program that developed partnerships with large state employers like John Deere, Rockwell Collins, and Allied insurance to provide incentives for college graduates to Iowa, developing a website in the process (www.smartcareermove.com) (Burcum, 2003).

Metropolitan areas have capitalized on their attractiveness to young college graduates. In partnership with the University of Wisconsin, the city of Milwaukee created the Milwaukee Idea, a project focused on retaining talent in Milwaukee through an economic development consortium focused on linking students and faculty with local businesses and service to the community (Durhams, 2000). After a study of brain drain in the metropolitan Boston area, the Boston Chamber of Commerce implemented programs to enhance housing affordability and link college students with local businesses through internships and service programs (Lewis, 2003). In 2005, Wisconsin governor Jim Doyle devoted $1.1 million to a plan that's goal will be to make Wisconsin more attractive to college graduates (Pascova, 2005).

[7] The Illinois Education Research Council has a project underway that is beginning to demonstrate the usefulness of tracking high school students into and through college. The Longitudinal Study of the Class of 2002 is following all 113,600 public high school graduates as they enroll, transfer and complete programs in institutions of higher education in Illinois and across the country. This project also has the potential to use employment data to assess the long-term economic impact of college migration on Illinois. See Presley and Gong (2005) for the first report on College Readiness of the Class of 2002 and Gong and Presley (2006 forthcoming) for college-going results.

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The Illinois Education Research Council was established in 2000 at Southern Illinois University to provide Illinois with education research to support P-16 education policy making and program development. The IERC undertakes independent research and policy analysis, often in collaboration with other researchers, that informs and strengthens Illinois' commitment to providing a seamless system of educational opportunities for its citizens. Through publications, presentations, participation on committees and an annual research symposium, the IERC brings objective and reliable evidence to the work of state policy makers and practitioners.