

# The Economic Impact of International Students

## In Northeast Ohio

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### Abstract

This paper investigates the economic impact of international undergraduate and intensive English language (IEL) students at Northeast Ohio's three largest public universities. This study uses primary data gathered from surveying international students in Northeast Ohio. International undergraduate and IEL students at Northeast Ohio's 3 major public universities spend \$25.5 million in the regional economy through direct purchases of local goods and services. This translates into a net regional economic contribution of \$20.2 million in revenue, \$40 million in economic output, \$11 million in household earnings and 437 jobs. The findings suggest that the higher tuition international students pay relative to in-state students is a critical component of economic impact.

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### Introduction

The engineering student from China, the computer science student from India, and the business student from Poland studying at Northeast Ohio universities may never cross paths. Yet they are linked as part of the vision to further globalize Ohio's public universities. Ohio's Strategic Plan for Higher Education calls for a massive 160% increase in international student enrollment in Ohio's universities by 2017. <sup>[1]</sup>

The Organization for Economic Cooperation and Development (OECD) states that "foreign students in significant numbers can have an impact on the life of the local economy" (2002). This study seeks to discover the local economic impact of international students enrolled in Northeast Ohio's three largest public universities. This paper addresses three voids in the current body of literature. First, public policy made in Columbus produces local consequences that are of interest to the local population. To the best of the author's knowledge, this is the first publicly available study on the impact of international students in a particular part of the state.

Second, much of current literature emphasizes the long term economic impact of foreign graduate students. Policymakers and academics recognize international graduate students as instrumental to sustaining the nation's work force and progress in science, engineering, and technology. Foreign graduate students are a significant portion of total enrollment in these disciplines at U.S. institutions (National Science Foundation, 2010). Non graduates, however, significantly differ from graduate students in their educational coursework. Therefore, previous studies focusing graduate students, who are concentrated in scientific and technical fields, do not provide insight into the economic impact of international students in other academic levels.

Third, this paper estimates direct, indirect, and induced economic effects using primary data gathered from surveying international students about their expenses in the region. To the best of the author's knowledge, this paper is the first attempt at estimating the multiplier effect of international students in any part of Ohio. Furthermore, recent high profile studies at the national level have not accounted for the multiplier effect. Therefore, the lessons learned from this attempt will provide future researchers with a reference that currently does not exist.

This study finds that international undergraduate and ESL students at Northeast Ohio's 3 major public universities spend \$25.5 million in the regional economy through direct purchases of local goods and services. This translates into an overall economic contribution of \$20.2 million in net revenue, \$40 million in net regional economic output, \$11 million in net household earnings and 437 net jobs.

The following sections will review background information on international students, the theoretical construct of this research, methodology used, results, public policy implications and limitations. This paper is strictly an economic impact analysis. Therefore a cost-benefit analysis, fiscal impact analysis, and evaluation of the goals of the Strategic Plan for Higher Education as a good or bad policy are beyond the scope of this paper.

## Literature Review

### International Students in the United States

Much has been written and discussed regarding globalization. Perhaps the most succinct articulation of this world view is the title of Thomas Friedman's book, *The World is Flat* (2005). In his book, Friedman describes individuals, businesses, and industries operating in an increasingly borderless world.

Within this world view, the increasing number of "international" students in higher education comes as no surprise. Globally mobile or international students are those who study in a foreign country of which they are not permanent residents (UNESCO 2009). These students increased from 2 million to 3 million at the post secondary level worldwide between 2001 and 2008, a whopping increase of 50% in just seven years. China and India send the greatest number of students abroad, with 421,100 and 153,300 respectively in 2009. South Korea (105,300 students), Germany (77,500) and Japan (54,500) form the remaining top five nations sending students abroad (UNESCO 2009).

The growth in international student mobility is not a new trend. According to UNESCO, the absolute number of globally mobile students grew 2.5 times between 1975 and 2007. Although the ratio of globally mobile tertiary students between 1999 and 2007 remained unchanged at approximately 2% of total tertiary enrollment, the raw numbers highlight the expanding market for international education (UNESCO, 2009).

While the U.S. is the most popular destination for international students, U.S. market share has declined since 2001. The U.S. hosted 21% or 671,000 of the world's international students in the 2008-2009 academic year as compared to 28% in 2001 (Institute for International Education, 2009). India is leading originator of international students in the U.S. with 15.4% of total foreign enrollment, followed by China (14.6%), South Korea (11.2%), Canada (4.4%) and Japan (4.4%). The decline of U.S. market share has been attributed to tighter visa policies after September 11<sup>th</sup>, 2001 as well as increased global competition for graduate students in scientific and technical fields from countries like India, China and Canada (Congressional Research Service, 2010).<sup>[2]</sup> However, a report from the Institute of International Education reveals that the number of foreign born students at U.S. post secondary institutions jumped 8% in the 2008-2009 academic year, the largest annual increase since 1980. The increase is attributed to recruitment efforts by U.S. institutions and recent improvements in visa processing (Congressional Research Service, 2010).<sup>[3]</sup>

### Economic Impact of International Students

The U.S. Department of Commerce reports that education services is the nation's fifth largest service sector export (2007). The U.S. has approximately 21% of the market for education services in terms of students, but nearly half the global market share in terms of revenue. U.S. receipts from international students totaled \$17.8 billion in 2008, representing an estimated 40-45% of the global market for education services. International students added revenue to the economy through travel, tuition, fees, and living expenses incurred in the U.S. Expenses for U.S. students studying abroad were approximately \$5.2 billion in 2008, yielding a positive trade balance of \$12.6 billion (U.S. Department of Trade, 2009).

Most international students finance their education and living expenses through overseas sources, directly injecting foreign dollars into the U.S. economy. According to the Institute of International Education, 86% of undergraduates, 85% of non degree or ESL students, and 52% of graduate students finance their education through funding from their families, home government, or home university. There are, however, opposing views as to the true value of foreign student expenditures.

Borjas (2002) argues that international students spending is outweighed by the costs of tax payer financed grants and subsidies at public universities. He argues that international students do not pay the true cost of their education, even if they pay the higher out of state tuition, because they benefit from all of the resources that public universities obtain primarily through tax payer funding. The OECD (2002), on the other hand, states that universities can profit from international students even if international students are not paying tuition at true cost. For instance, international students can help schools achieve the critical mass required for economies of scale, particularly at small schools.

Policymakers and academics have widely recognized the contributions of international students to the nation's science and engineering brain power, innovation, and entrepreneurship. The Government Accountability Office (2009) states the United States has historically relied on international students to fill critical gaps in science, technology, mathematics and engineering fields. According to a 2008 Duke University study, 1 in 4 new science and technology companies created in the U.S. between 1995 and 2005 had an immigrant founder, the majority of whom originally came to the U.S. for higher education. Chellaraj et al (2008) found that foreign graduate students have a significant positive impact on U.S. innovation as measured through patent activity. They reported that a 10% increase in the number of international graduate students would increase patent applications by 4.5%, university patent grants by 6.8% and non university patent grants by 5.0%.

Statistics on international student degree programs highlight that graduate students are overwhelmingly more significant than undergraduates in their science and engineering contributions. The National Science Foundation (2010) reports that foreign students earned nearly a quarter of all science and engineering (S&E) master's degrees, one third of all S&E doctoral degrees, and almost 60 % of engineering doctorates in 2008. In contrast, foreign students earned only 4% of all S&E bachelor's degrees. This leads to the question of what, if any, economic benefits do non-graduate foreign students bring? This study aims to provide insight at the regional level, focusing on the undergraduate and intensive English language student populations.

Few studies offer insight into the economic impact of non graduate international students in the U.S. The Institute of International Education's (IIE) annual Open Doors report highlights the net expenditures of international students by education level. IIE does not attempt to calculate the total effect on the economy. The total effect includes direct, indirect, and induced effects, which are defined in the *Total Impact Estimate* subsection of this paper.

There are international economic impact studies that help motivate the present topic. A study commissioned by the government of British Columbia, Canada, found that the 28,100 international students in the province spend \$511 million in direct purchases of goods and services annually. This direct expenditure produced an estimated additional economic impact of \$485 million in provincial GDP, 9,100 jobs, and \$67 million in government revenue (Roslyn Kunin & Associates, 2006). A U.K. study estimated that foreign students contributed £2 billion to national GDP in conservative terms after the multiplier effect was applied (Bekhradnia and Vickers, 2007).

## International Students in Ohio

### Background

Ohio is the 9<sup>th</sup> most popular host state in the U.S, attracting 20,725 international students in the 2008-2009 Academic year (IIE, 2007). According to the Institute of International Education, international students and their dependents contribute over half a billion dollars to the state economy through tuition, living expenses, and entertainment in Ohio. The top five countries of origin for foreign students are India, China, South Korea, Turkey and Taiwan, as shown in Table 1. This differs from the top five countries of origin nationally: China, India, South Korea, Canada, and Japan.

Place of Origin	Total Number	Percent Total
India	4,222	21.7
China	4,134	21.2
South Korea	1,707	8.8

Turkey	1,268	6.5
Taiwan	786	4.0

Source: Institute of International Education, Open Doors 2009 State Fact Sheet, Ohio

#### International Students in Northeast Ohio's Major Public Universities

The total international enrollment for Cleveland State University, Kent State University, and the University of Akron is 3,810 for Spring 2010. Of this amount, 28% (1,084) belong to the combined undergraduate and intensive English language (IEL) population that is of interest for this study.

Table 2 highlights international student enrollment at Northeast Ohio's three largest public universities. Kent State University has the highest population of interest. The University of Akron, however, enrolled the largest number of international students of all categories. Undergraduate students constitute 77% of the total population of interest and IEL students constitute 33%.

Program Type	Cleveland State University	Kent State University	University of Akron	Total
<b>Undergraduate</b>	198	440	214	836
<b>Intensive English Language (IEL)</b>	60	64	108	221
<b>Population of Interest</b>	258	504	322	1,084
<b>All Programs (Undergraduate, Graduate, IEL, OPT and other)</b>	982	1,127	1,662	3,810

Source: Cleveland State University, Kent State University, University of Akron

The top countries of origin for Northeast Ohio's foreign students are China, Saudi Arabia, Canada, Korea, and India (Table 3). The importance of Saudi Arabia and Canada differs from the top countries of origin statewide (India, China, South Korea, Turkey and Taiwan).

Table 4 provides a demographic breakdown of IEL students at Kent State University and the University of Akron. Saudi Arabia dominates as the top country of origin for IEL students. Saudi students constitute almost 60% of IEL enrollment among the two institutions. Japan is the second leading country of origin, with 10% of IEL enrollment. Taiwan and China follow, with 6% of IEL enrollment.

Rank	Country of Origin	Count	Percent	Rank	Country of Origin	Count	Percent
1	China	299	36%	11	Vietnam	11	1%
2	Saudi Arabia	99	12%	12	United Kingdom	11	1%
3	Canada	42	5%	13	Thailand	10	1%
4	South Korea	33	4%	14	Russia	10	1%
5	India	30	4%	15	Pakistan	9	1%
6	Taiwan	17	2%	16	Brazil	8	1%
7	Nigeria	17	2%	17	Indonesia	7	1%
8	Nepal	17	2%	18	*Congo	7	1%
9	Turkey	16	2%	--	Other	176	21%
10	Jordan	15	2%	--	<b>Total</b>	<b>834</b>	<b>100%</b>

Source: Cleveland State University, Kent State University, University of Akron

Rank	Country	Count	Percent	Rank	Country	Count	Percent
1	Saudi Arabia	98	57%	8	Germany	3	2%
2	Japan	17	10%	9	Turkey	3	2%
3	Taiwan	11	6%	10	France	2	1%
4	Other	11	6%	11	Hong Kong	2	1%
5	China	10	6%	12	India	2	1%
6	South Korea	5	3%	13	Libya	2	1%
7	Burkina Faso	3	2%	14	Oman	2	1%
Total	171	---	---	---	---	---	---

Source: Kent State University and the University of Akron

## Methodology

## Primary Data Collection

A convenience sample of students at a three major Northeast Ohio public universities was taken through an online and paper survey. The response rate was 11% with 100 students responding. Due to several incomplete responses, the final sample consisted of 88 respondents. Participants answered questions relating to their monthly expenses on housing, living costs, and entertainment, semester tuition fees, the amount of aid from sources in Ohio, and their demographic background.

The primary data forms the basis of estimated average annual expenses for the entire population. Total estimated annual expenses are used as inputs in Bureau of Economic Analysis Regional Input-Output Modeling System (RIMS II). These inputs were applied to Type II multipliers. The resulting outputs are the estimated annual direct, indirect and induced economic effects of international students enrolled in Northeast Ohio's three largest public universities. Further details on the RIMS II system, multipliers, and direct, indirect, and induced effects are described in the *Total Impact Estimate* subsection of this paper.

## Survey Instrument

The survey instrument consisted of 25 multiple choice and open ended questions. The questions were modified from a 2006 Roslyn Kunin and Associates questionnaire for international students in British Columbia. Testing and distributing the survey required prior training in human subject research, certification, and survey approval from the *University of Akron Institutional Review Board for the Protection of Human Subjects*. Twelve international and American graduate students from the University of Akron tested the survey and provided feedback on language clarity. The process of obtaining official approval and testing the survey lasted approximately two months.

Participants were recruited primarily through an email link from the Office of International Programs at each institution. Students at the University of Akron English Language Institute were also recruited through a handout from classroom instructors. Kent State University was the only institution that isolated undergraduate and ESL students from the entire international student email list. Respondents were eligible for a random drawing of a \$25 card to a store of the winner's choice. In order to discourage invalid responses from graduate students, all methods of communication also included a message that graduate students would not be eligible for the gift card.

The response window extended approximately one month, from March 9<sup>th</sup> to April 5<sup>th</sup>, 2010. During this period the survey was available online. Participants at the University of Akron were also directly approached with paper surveys. English Language Institute students at the University of Akron had the option to attend one of six sessions at Bierce Library and the Student Union for assistance with interpreting the survey.

## Total Impact Estimate-Economic Model

As previously mentioned, the primary data collected on international student expenses forms the basis of estimated average annual direct expenses for the entire population. Direct expense data must be converted into macroeconomic variables such as earnings and employment in order to be economically meaningful (Roslyn Kunin and Associates, 2006). Looking through a macroeconomic lens allows for understanding the magnitude of the impact of international education in the overall economy as well as comparisons against other industries.

The Bureau of Economic Analysis Regional Input-Output Modeling System (RIMS II) converts initial changes in output (such as direct expense data), earnings, or employment associated with a certain industry or activity into information on total estimated economic impact (BEA, 1997). RIMS II is based on an accounting framework called an Input-Output (I-O) table. For each industry, an I-O table shows the flow of goods and services purchased and sold. The BEA (1997) states that "a typical I-O table in RIMS II is derived from two data sources: the BEA's national I-O table, which shows the input and output structure of nearly 500 U.S. industries, and BEA's regional economic accounts, which are used to adjust the national I-O table in order to reflect regional industrial structures and trading patterns."

The I-O table is used to determine how much earnings or employment in the overall economy is created from a change in demand for one or more commodities or by a change in output of an industry (Roslyn Kunin and Associates). This is called the multiplier effect.

Krumme (2010) explains that in layman's terms, multipliers are estimators of the "ripple" effect. In technical terms, "multipliers are numerical coefficients which relate a change in a component of aggregate demand (or employment) to a consequent change in total income (or total employment)" (Krumme, 2010). Multiplying the level of change in an industry with the appropriate, industry specific numerical multiplier gives an estimate of total change in the economy to due to the change in a particular industry.

There are various types of multipliers. The multipliers used in this paper are Type II multipliers for final demand output, final demand earnings, and final demand employment. Type II multipliers are estimated by taking into consideration direct, indirect, and induced effects. Type I multipliers exclude induced effects. As Miller (2010) explains:

**Direct effects** occur to the firm that exports additional goods and services.

**Indirect effects** occur to backward linked industries that supply goods and services to the directly effected firms.

**Induced effects** occur from households locally spending some the additional income they receive.

There are several types of Type I and Type II multipliers. The type II multipliers used in this paper are defined as follows (BEA, 1997):

**Final demand output** multipliers estimate the total change in regional economic output due to a \$1 change final demand (output) in an industry

**Final demand earnings** multipliers estimate the total change in regional earnings due to a \$1 change in final demand (output) in an industry

**Final demand employment** multipliers estimate the total change in regional employment per \$1 million change in final demand (output) in an industry.

Another way to understand the term "output" is to think of it as sales. Miller (2010) explains that the output multiplier estimates the total increase in local sales due to \$1 increase in exports sales in a particular industry or activity. An estimate of the change in total regional economic output, earnings, or employment is calculated by multiplying the appropriate final demand change by the appropriate final demand multiplier (BEA, 1997). For instance, calculating the change in total output in the regional economy due to an increase in output (export sales) in the Education Services industry is found by multiplying the amount of the change with the final demand output multiplier.

## Total Impact Estimate-Model Application

### Step 1-Estimating the net annual regional revenue from International Students

International students are assumed to live in Northeast Ohio for 9 months out of the year. This approach is consistent with previous research.<sup>[6]</sup> Average monthly per person expenses on housing, living expenses etc from sample data are multiplied by 9 to find annual averages. Estimated annual averages are applied to the entire population. It is assumed that sample and population averages match.

Expenses are broken down into the categories defined below. It must be noted that these categories are constructed by the author to provide a descriptive picture of annual revenue. Expenses are later regrouped according to BEA industry definitions when applying multipliers to estimate actual earnings. The sources of data, however, remain the same.

#### Tuition and Fees

Tuition and fees was the only expense for which primary data was not gathered. International students are only asked to report whether full time or part time status. A full time student is assumed to be enrolled in 12 credit hours and a part time student is assumed to be enrolled in 6 credit hours. Estimated tuition and fees are calculated based on information provided on institutional websites.

Kent State University and Cleveland State University provide per semester tuition and fees estimates for international students online. The annual estimate for these institutions is based on the average of Fall 2009 and Spring 2010 full time tuition estimates provide online. For the University of Akron, it is necessary to apply an out of state tuition surcharge of \$308.27 per credit hour to obtain the total tuition and fees expense per student. Annual expenses are reduced by half for part time students. The average tuition and fees expense for the entire sample is multiplied by the total international student population to come up with an annual population estimate.

#### Housing costs

Housing costs for students who rented include internet access and utilities. The monthly rent, utilities, and internet costs are multiplied by 9 months to get an annual figure. For students who lived in university owned housing, semester housing fees are substituted for rent. Since dormitory fees are paid on a per semester basis (roughly 4.5 months), semester dorm fees are doubled for an annual figure. The average 9 month rent is multiplied by the number of international students in the three institutions to get a regional estimate.

#### Living expenses and Miscellaneous

Living expenses and miscellaneous are composed of groceries, transportation, clothes, mobile phone service fees, entertainment, and car insurance.

#### Local Funding

Local funding is counted as financial support from organizations in Ohio. Using the most conservative estimate, it is assumed that Ohio based funding for tuition and housing covers the full expense of these costs.<sup>[7]</sup> The proportion of respondents receiving local tuition and housing scholarships is applied to the entire region and subtracted from total international student expenditures.

For example, 32% of respondents reported receiving tuition scholarships and 12.5% reported receiving a housing scholarship from sources in Ohio. Therefore, the total tuition and housing expenditures by international students in the region is reduced by 32% and 12.5% respectively. The amount of this reduction is subtracted from total expenditures. This methodology is consistent with previous research (see footnote 5).

#### Spouse and Dependent Contribution

Approximately 8% of respondents (7/88) had a spouse and approximately 3% (3/88) had a child. It is assumed that these percentages are consistent for the entire population. The average number of children is 1.3, which is rounded down to 1.

Individual living expenses are increased by 25% to account for spousal expenses for 8% of the population. Individual living expenses are increased by 20% to account for the expenses of one child. The 25% and 20% figures are consistent with NAIFA/Indiana University analysis of international student analysis using data from the Institute of International Education's 2009 *Open Doors* report.<sup>[8]</sup> These figures are also within the range of federal poverty guidelines used to calculate additional household expenses per spouse and child (Baumgartner, 2010). Using these percentages the following calculations determine the additional economic impact of spouses and dependents:

Spouse contribution:

$$7/88 = .079545 = 8\% \quad 8\% * 25\% = .0199 \text{ or approximately } 2\%$$

The calculations above show that adding a 25% living expense increase to 8% of the sample due to the presence of spouses can be spread out as a 2% increase of living expenses for the entire sample.

Child contribution:

$$3/88 = .034091 = 3\% \quad 3\% * 20\% = .0068 \text{ or approximately } .7\%$$

The calculations above show that adding a 20% living expense increase to 3% of the sample due to the presence of one child can be spread out as a .7% increase in living expenses for the entire sample

Combined spouse and child contribution:

$$.0199 + .0068 = .0267 = 2.67\% \text{ rounded up to } 3\%$$

The calculations above show that the combined expenses of spouses and children can be estimated by increasing sample living expenses by 3%. Sample and population averages are assumed to match. Therefore, average living expenses for the entire population are increased 3% to account for expenses of spouses and children for 8% and 3% of the population respectively.

Adding international student expenses in various categories yields the total revenue contribution in the regional economy. Subtracting local financial assistance and adding spouse and dependent expenses yields the net revenue contribution. The net revenue contribution does not include the multiplier effect. Total annual expenses by categories are reorganized into industry based groupings to estimate economic impact using multipliers in steps 2 and 3.

### Step 2-Matching annual expenditures to appropriate BEA industries and multipliers

This study uses 2005 Type II final demand multipliers for Northeast Ohio industries. Northeast Ohio encompasses the metropolitan statistical areas of Akron, Canton-Masillon, Cleveland-Elyria-Mentor, and Youngstown-Warren Boardman.

Estimated total annual international student expenditures per category such as tuition, food, clothing etc are matched to the appropriate BEA industries. BEA industry definitions for 2005 multipliers are consistent with the 2002 North American Industry Classification System, commonly known as NAICS (BEA, 2010).

### Step 3-Determining the gross and net economic impact

Gross economic impact is computed by multiplying gross international student expenses per industry with the appropriate final demand multipliers. This approach is consistent with the methodology used by Roslyn Kunin & Associates (2006) for calculating the economic impact of international students in British Columbia. When an expense category belongs to more than one industry, the expense is multiplied with average multiplier for all relevant industries. For instance, housing expenses include rent, utilities, and cable/internet fees. Therefore the multiplier for housing is composed of the average multipliers for the utilities, broadcasting & telecommunications, and real estate industries.

Net economic impact is computed by taking an average multiplier for all relevant industries and multiplying it with the net foreign students expense calculated in step 1. Net economic impact accounts for the reductive effect of local economic support, which does not bring new money into the region. Net economic impact also includes the additional expenses of dependents. Since the majority of expenses occur in the service sector, distribution costs are negligible and hence ignored. [9]

## Results

### Sample Demographics

The sample size consisted of 88 respondents from 32 countries. The sample is fairly representative of the total population by academic level. Undergraduate constitute the vast majority (77%) of the population and also constituted the vast majority of the sample (83%).

The top five countries of origin among respondents are China, Saudi Arabia, India, South Korea, and Brazil (see table 5). These countries are generally similar to the cluster of top countries of origin for the population with the exception of Brazil (please refer to Tables 3 and 4). Percentages, however, vary from the population.

Some noticeable absences from the sample top five are Canada, Japan and Taiwan. Canada is the third leading country of origin for the undergraduate population but is absent from the sample top five. Japan and Taiwan are among the leading countries of origin for the IEL population but are also not among the sample top five. As mentioned earlier, the true IEL population demographics for Spring 2010 are unknown due to the absence of IEL demographic data from Cleveland State. Therefore the IEL sample cannot be compared to the population.

Respondents who failed to list a country or who identified a region rather than a country are counted as *unknown*. The *other* category includes 23 countries from which only one respondent originates (see Appendix 1)

Country of Origin	Count	Percent
China	16	18%
Saudi Arabia	14	16%
India	12	14%
South Korea	7	8%
Unknown	3	3%
Brazil	3	3%
Canada	2	2%
Nigeria	2	2%
Pakistan	2	2%
Vietnam	2	2%
Other	28	32%
Total	88	100%

### Average Annual Expenses

Tuition and fees is the largest annual expense for the average international student. The mean tuition and fees payment is \$13,055 (Table 6). The upper and lower extremes do not vary considerably. Housing is the next highest expense and shows considerable variation. The mean annual housing expense is close to \$5,646. However, the students with the highest housing costs (upper bound) spend approximately 20% more than the students with the lowest housing costs.

Discretionary items such as groceries, entertainment, clothing, and automobile related expenses such as insurance and gas exhibit the greatest variations. While the average international student spends \$1,500 on groceries every year, the students at the upper extreme pay approximately \$600 (40%) more than the lowest spenders. The average spending on entertainment such as movies, bars and restaurants is \$1,081 annually. The biggest spenders, however, pay approximately 60% more for entertainment than the most frugal students.

The variation is even greater for clothing. The difference between the students who spend the most money on clothes shopping and those who spend the least in the region is more than double. Gas expenses have the largest variation between the upper and lower extremes. The students who pay the most on gas pay over 200% more than the students who spend the least. The difference between the upper and lower extremes for car insurance is 134%.

Category	Sample Mean	95% Confidence Interval	
		Lower Bound	Upper Bound
<b>Tuition and Fees</b>	13,055	12,376	13,733
<b>Housing</b>	5,646	5,151	6,141
<b>Groceries</b>	1,817	1,511	2,123
<b>Mobile Phone</b>	447	391	502
<b>Car insurance</b>	433	259	607
<b>Gas</b>	350	203	496
<b>Public Transport</b>	40	14	65
<b>Entertainment</b>	1,081	826	1,336
<b>Clothes</b>	701	408	995

The sample means in Table 6 are the foundation for estimating total annual revenue to the regional economy (Table 7) from international students. These averages also form the basis for estimating total economic impact. As previously mentioned, the sample means in Table 6 are assumed to match population means. The averages are multiplied by the size of the international student population to find gross and net revenues in Tables 7. Net revenue is then used to calculate total economic impact using multipliers in Tables 9 and 10.

**Annual Revenue From International Students**

Contribution from tuition and fees:	\$14,151,318
Contribution from Housing: (Includes rent, internet access, and utilities)	\$6,120,010
Contribution from living expenses and miscellaneous: (groceries, transportation, clothes, mobile phone, entertainment, and car insurance)	\$5,277,166
Gross revenue:	\$25,548,495
Less Ohio Support:	\$5,641,400
Plus spouse and dependent contribution:	\$296,774
Net revenue:	\$20,203,869

Gross annual revenue to the regional economy from international undergraduates and ESL students enrolled in Northeast Ohio's 3 major public universities is \$25,548,495. As shown in Table 7, subtracting local assistance of approximately \$5.6 million dollars and adding the spouse and dependent contributions yields net revenues of \$20.2 million dollars. Tuition and fees are by far the largest expenses international students face, totaling \$14,151,318 or 55% of total revenue. The \$6,120,010 in annual housing expenses constitutes 24% of total revenue. Contributions from living expenses total \$5,277,166 or 21% of total revenue.

A breakdown of living expenses is provided in Table 8. Groceries and entertainment are by far the largest categories of living expenses.

Category	Amount	Percent
Groceries	\$1,969,271	37%
Mobile Phone	\$484,188	9%
Car insurance	\$469,471	9%
Gas	\$379,154	7%
Public Transport	\$42,960	1%
Entertainment	\$1,171,829	22%
Clothes	\$760,295	14%
Total Living expenses	\$5,277,166	100%

**Economic Impact for Output and Earnings**

International students studying at Northeast Ohio's three largest public universities yield a gross economic impact of \$51 million increase in final demand output and \$16.1 million increase in final demand earnings (Table 9). In net terms, the presence of international students increases regional economic output by \$40 million and regional by \$11 million.

Gross impact computed by multiplying gross international student expenses per category with the appropriate multiplier and adding all of the resulting figures. Net impact is computed by taking an average multiplier for all relevant industries and multiplying it with net population revenue from Table 7. Net sales account for the reductive effect of local economic support, which does not bring new money into the region, as well as the additional expenses of dependents.

Expense Category	Total Annual Expenses	Industry	Output Multiplier <sup>1</sup>	Final Demand Output	Earnings Multiplier <sup>1</sup>	Final Demand Earnings
Tuition and Fees	\$14,151,318	Educational services	2.1269	\$30,098,439	0.7944	\$11,241,807
Housing	\$6,120,010	Utilities; broadcasting & telecom; real estate	1.7163	\$10,503,621	0.2774	\$1,697,691
Groceries	\$1,969,271	Retail trade	1.9675	\$3,874,540	0.6215	\$1,223,902
Mobile Phone	\$484,188	Broadcasting and telecommunications	1.853	\$897,200	0.3824	\$185,154
Car insurance	\$469,471	Insurance carriers and related activities	2.073	\$973,494	0.5806	\$272,575
Gas	\$379,154	Retail trade	1.9675	\$745,985	0.6215	\$235,644
Public Transport	\$42,960	Transit and ground passenger transport	2.1494	\$92,337	0.7358	\$31,610
Entertainment	\$1,171,829	Performing arts, museums & related; amusements, gambling, & recreation; food services/drinking	1.9976	\$2,340,845	0.6292	\$737,354
Clothes	\$760,295	Retail trade	1.9675	\$1,495,881	0.6215	\$472,523
Gross	25,548,495	All industries	--	\$51,022,343 <sup>2</sup>	---	\$16,098,259 <sup>2</sup>
Avg. Multiplier	---	All industries	1.9799	---	0.5849	---
Net	\$20,203,869	All industries	---	\$40,002,033 <sup>3</sup>	---	\$11,817,767 <sup>3</sup>

<sup>1</sup>For expense categories such as housing, which match up to more than one BEA industry, the multiplier is computed as the average of the multipliers for all relevant industries. Output and earnings multipliers are in terms of dollars.

<sup>2</sup>Gross final demand output and final demand earnings is the sum of final demand output and final demand earnings respectively for each expense category.

<sup>3</sup>Net final demand output is the product of the average output multiplier for all industries (1.9799) multiplied by the net annual expenses of \$20,203,869 from Table 7. Net impact for final demand earnings is the product of the average earnings multiplier for all industries (.5849) multiplied by the net annual expense.

### Economic Impact for Employment

Foreign student tuition and fees generate the largest economic impact. The Education Services sector account for 59% of gross increase in regional output and 70% of the gross increase in regional household earnings. The multipliers show that each additional \$1 of output in the educational services sector generates a \$2.13 increase regional economic output and a \$0.79 increase in household earnings. Housing expenses are also significant. Housing costs account for 26% of the gross increase in regional economic output and 14% of the gross increase in regional economic earnings. Every dollar that international students spend on housing increases gross regional output by \$1.71 and gross regional household earnings by \$0.27.

Table 10. Multiplier Effect for Final Demand Employment				
Expense Category	Expenditure (in Millions)	Industry	Employment Multiplier (Jobs per \$1 Million Revenue)	Final Demand Employment
Tuition and Fees	14.15	Educational services	28.3683	401
Housing	6.12	Utilities; broadcasting & telecom.; real estate	6.5932	40
Groceries	1.97	Retail trade	23.8936	47
Mobile Phone	0.48	Broadcasting and telecom.	8.7695	4
Car insurance	0.47	Insurance carriers and related activities	13.0204	6
Gas	0.38	Retail trade	23.8936	9
Public Transport	0.04	Transit and ground passenger transport	35.7713	2
Entertainment	1.17	Performing arts, museums & related; amusements, gambling, & recreation; food services/drinking;	30.3829	36
Clothes	0.76	Retail trade	23.8936	18
Gross	25.55	All industries	---	564
Average Multiplier	---	All industries	21.6207	---
Net	20.20	All industries	---	437

Foreign student expenditures spark a gross increase of 564 jobs and a net increase of 437 jobs in the local economy. The net number of jobs created is the product of net sales for all industries (\$20.20 million) and the average employment multiplier for all industries. Net sales account for the reductive effect of local economic support as well as the additional expenses of dependents.

Once again, the educational services sector generates the overwhelming majority of gross impact. Educational services accounts for 71% of gross jobs created in the regional economy. Each \$1 million of expenses by international students in the educational services sector adds 28.37 jobs to the regional economy in gross terms. <sup>[10]</sup> The total increase of \$14.5 million in sales (final demand output) for the education sector produces a gross gain of 401 jobs in the regional economy.

The dominance of educational services is not surprising. Given the labor intensive nature of educational services, the industry is expected to constitute a larger proportion of overall employment impact as compared to other industries in which international students generate sales (Roslyn Kunin, 2007). A previous study on the economic impact of international students in British Columbia found that educational services generates more than half of total regional employment gains (Roslyn Kunin, 2007).

### Economic Impact Summary

International undergraduate and ESL students at Northeast Ohio's 3 major public universities spend \$25.5 million in the regional economy through direct purchases of local goods and services. This translates into an overall contribution of \$20.2 million in net revenue, \$40 million in net regional economic output, \$11 million in net household earnings (GDP) and 437 jobs net employment gain.

## Implications

### International Tuition Fees are Critical to Economic Impact

International undergraduate and ESL student spending in the educational services sector accounts for 55% of total revenue added to the economy. The majority of estimated additional gross economic output (55%), earnings (70%) and employment (75%) result from international student spending in educational services. Tuition and fees drives international student spending in the education services sector.

The importance of tuition and fees suggests that international student tuition differential is important in maximizing regional economic gains from undergraduate and ESL students. International students pay out of state tuition rates. On average, international student full time tuition is 42% higher than resident students (See appendix 2). Tuition numbers reported by the three universities show that ESL students are charged the same rates regardless of residency status. Higher undergraduate fees account for a significant portion of gross tuition revenues. If all international students paid the same rate as residents, tuition revenue would plunge 32% from \$14.2 million to \$9.6 million (see appendix 2).

The basic laws of demand indicate that lowering the educational price for international students by lowering or eliminating the tuition differential would increase demand. However, it is not known if an increase in demand would be large enough to offset the revenue loss from reduced tuition. Further research is needed to determine the costs and benefits of reducing or abolishing the international student tuition differential.

It may be argued that international students are no more beneficial than domestic out of state students because both groups pay the same non-resident tuition fees. However, out of state students have the option to apply for residency after living in the state for one year. International students do not have this option. Therefore, international students are guaranteed to be billed significantly higher tuition than residents throughout the course of their education.

### Tax Revenue

International undergraduate and ESL students in Northeast Ohio have a negligible impact on the size of the regional income tax base. The estimated \$11 million increase in earnings adds estimated income tax revenues of \$425,203 using an average state income tax rate of 4%. The exact tax impact is not possible to gauge for several reasons. Ohio's progressive tax structure means that households are taxed at various rates. Therefore, the average state income tax rate is used. Furthermore, various tax deductions and exemptions could make some portion of the \$11 million entirely non taxable because some households may not pay taxes at all. See appendix 3 for tax revenue calculations.

### Return on Investment for Taxpayers

The average cost to the state of Ohio to educate one full time undergraduate student at a public university is \$4049 (Ohio Board of Regents, 2008). The average tuition for a full time undergraduate international student is \$7339 (see appendix 2). Therefore, the tuition fees international students pay is almost 200% of the tax payer's cost to educate them. <sup>[11]</sup>

### Impact Relative to Regional Economy

International undergraduate and IEL students enrolled in Northeast Ohio's three largest public universities have a negligible impact on job creation in the region. Northeast Ohio's employed labor force stands at 1.7 million (Ohio Department of Job and Family Services, 2010). The net addition of 437 jobs due to student spending on goods and services is a miniscule .03% of total non-farm employment (see Appendix 4). The impact is also insignificant for just the educational and health services sector. The gross addition of 401 jobs is less than half a percent (.26%) of total regional employment in the sector.

The above numbers suggest that regional economic impact of international undergraduate and ESL students at Northeast Ohio's three largest public universities, while positive, is insignificant. There are, however, more than 20 colleges and universities in the region (Team NEO, 2010). If all public and private universities in Northeast Ohio are included, the economic impact, and thus significance relative to other sectors of the economy, is likely to be greater. The lack of regional employment data on purely the educational services sector (rather than the combined educational and health services sector) may have also reduced the significance of the employment impact.

### Implications Summary

The overwhelming majority of regional economic benefits stem from international undergraduate and ESL spending in the educational services sector through tuition and fees. These results suggest that the higher fees international students pay relative to domestic students is a critical component of regional economic gains. If the tuition differential did not exist, revenues in the educational services sector would plunge 32%.

International undergraduate and ESL student enrolled at Northeast Ohio's three largest public universities have a positive but insignificant regional economic impact. This result is not surprising given that only 3 universities are investigated. A more comprehensive investigation that includes all of Northeast Ohio's colleges and universities may reveal larger economic gains.

### Limitations and Suggestions for Future Research

One of the major limitations in economic impact studies is the economic model itself. First, Input-Output models are linear. They assume that a given change in the outputs of an industry result in a proportional change in production. Second, I-O models do not take into account the time required for change to occur. Rather, they assume that changes occur immediately. Third, I-O models assume that there are no capacity constraints to growth. Furthermore, the use of 2005 rather than 2010 multipliers may have reduced the accuracy of the outputs from the I-O model.

There are also data related limitations. Tuition and fees data may be more precise because they are based on information from university websites. The majority of data analyzed is based on the estimates and recollections of survey respondents. Thus, the potential for human error is high.

Furthermore, the possibility that self selection bias may have skewed responses does exist. Those international students who have an interest in economic issues may have been more inclined to take the survey. In addition, language barriers, particularly among intensive English language students could have caused some students to misinterpret questions. Also, there may be types of international student expenses that are not accounted for in the survey such as medical expenses.

The scope of the study is another limitation. This study examines the three largest public universities in Northeast Ohio. However, there are more than 20 public and private colleges and universities in the region. Broadening the scope of the study to include all of these institutions may provide more accurate picture of economic implications relative to the size of the regional economy.

Future researchers may consider investigating expenditures by demographic categories. Large variations in average individual expenses indicate that international students are not uniform in their spending habits. A demographic analysis of spending can reveal if students of certain nationalities, degree programs, etc are more profitable for the region than others.

Future research can also involve more regional institutions of higher education. A larger sample size would reduce the data related limitations of a small sample size as discussed above. Including all of region's higher education institutions (public and private) would provide regional economic impact figures that can be better compared relative to the regional economy. Finally, this study does not consider all of the costs to tax payers for educating an international student at one of Northeast Ohio's public universities. A complete cost benefit analysis can provide policy makers with the tools to determine if the economic benefits described in this study outweigh costs.

Appendix 1

Respondents By Country of Origin	
Country	Count
Albania	1
Brazil	3
Canada	2
China	16
Costa Rica	1
Czech Republic	1yy
Ethiopia	1
Germany	2
Haiti	1
India	12
Indonesia	1
Jamaica	1
Japan	1
Kuwait	1
Libya	1
Malaysia	2
Nepal	1

New Zealand	1
Nigeria	2
Pakistan	2
Poland	1
Romania	1
Saudi Arabia	14
Serbia	1
South Africa	1
South Korea	7
Taiwan	1
Thailand	1
Trinidad & Tobago	1
United Kingdom	1
Venezuela	1
Vietnam	2
Unknown	3

Appendix 2

Average Resident and Non Resident Tuition & Fees and Taxpayer Cost for Higher Education

Tuition and Fees	Resident (\$)	Non Resident (\$)
University of Akron Full Time	4191.48	7890.72
University of Akron Part Time	2095.74	3945.36
Cleveland State University Full Time	4098	5918.04
Cleveland State University Part Time	2049	2959.02
Kent State University Full Time	4515	8209
Kent State University Part Time	2257.5	4104.5
Average full time non resident tuition	7339.25333	
State average cost to educate full time student	4,049	
Non resident tuition as % of tax payer cost	1.81260887	

Tuition data from Cleveland State University, Kent State University, and University of Akron 2010. Data on state average higher education costs from Ohio Board of Regents, 2010.

Appendix 3

Tax Revenue from International Students

State of Ohio Income Tax Rates	
– \$5,000	0.618% of Ohio taxable income
\$5,001 – \$10,000	\$30.90 + 1.236% of excess of \$5,000
\$10,001 – \$15,000	\$92.70 + 2.473% of excess over \$10,000
\$15,001 – \$20,000	\$216.35 + 3.091% of excess over \$15,000
\$20,001 – \$40,000	\$370.90 + 3.708% of excess over \$20,000
\$40,001 – \$80,000	\$1,112.50 + 4.327% of

	excess over \$40,000
\$80,001 – \$100,000	\$2,843.30 + 4.945% of excess over \$80,000
\$100,001 – \$200,000	\$3,832.30 + 5.741% of excess over \$100,000
More than \$200,000	\$9,573.30 + 6.24% of excess over \$200,000

Source: [http://www.tax.ohio.gov/divisions/ohio\\_individual/individual/annual\\_tax\\_rates.stm](http://www.tax.ohio.gov/divisions/ohio_individual/individual/annual_tax_rates.stm)

	Net Final Demand Earnings	Average Tax Rate
	11,817,767	0.03598
<b>Estimated Tax Revenue</b>	<b>\$425,203.26</b>	

Estimated Tax Revenue from Final Demand Earnings

Appendix 4  
Relative Economic Impact Calculations

<b>Northeast Ohio Consists of:</b>
Akron MSA
Canton - Massillon MSA
Cleveland - Elyria - Mentor MSA
Youngstown - Warren - Boardman MSA
<b>Educational and Health Services</b>
Total regional employment
155,200
Gross jobs added in education sector
401
Relative impact
0.258376289
0.26%
<b>Nonagricultural Sector</b>
Total regional employment
1,680,500
Net jobs added in regional economy
437
Relative impact
0.026004165
0.03%

Data from Ohio Department of Job and Family Services, Ohio Labor Market Information, *Current Employment Statistics Query*.

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[1] See Ohio's Strategic Plan for Higher Education, 104. The plan aims to increase total annual international student enrollment in the University System of Ohio from 13,538 in 2006 to 35,134 by 2017.

[2] The Congressional Research Service 2009 Report, *Foreign Science and Engineering Presence in U.S. Institutions and the Labor Force*, refers to the following: Mattioli, Dana, "With Fewer U.S. Opportunities, Home Looks Appealing to Expats," *The Wall Street Journal*, December 17, 2009, p. A27; Birchard, Karen, "Canada Seeks More Foreign Students," *The Chronicle of Higher Education*, v. 51, April 29, 2005, p. A39; and Altbach, Philip G., "Higher Education Crosses Borders - Can the United States Remain the Top Destination for Foreign Students?," *Change*, March/April 2004, pp. 19-24.

[3] The Congressional Research Service 2009 Report, *Foreign Science and Engineering Presence in U.S. Institutions and the Labor Force* refers to the following: A survey separate from the *Open Doors Report* (conducted by higher education associations) states that "The major reasons for the reported increases appear to be largely related to continued active recruitment efforts (cited by 28% of responding institutions), the growing reputation and visibility of U.S. campuses abroad (26%), and an increased number of linkages with institutions in other countries. The responding institutions that experienced declines in international student enrollments cited the world financial crises (cited by 23%), the cost of tuition/fees at U.S. institutions (21%), and home country economic problems (19%) as major reasons for declines at their institutions. Many other respondents indicated students' concerns about the H1N1 virus, lack of financial aid or scholarships, and a poor U.S. job market." Institute of International Education, *Fall 2009: Joint Survey on International Student Enrollments in the US*, November 16, 2009, <http://opendoors.iienetwork.org/?p=150650>. Also see for example Government Accountability Office, *Higher Education - United States' and Other Countries' Strategies for Attracting and Funding International Students*, GAO08-8781, Washington, DC, June 19, 2008, 12 pp., and Hermes, JJ, "New Fulbright Grant Brings Scientists to U.S.," *The Chronicle of Higher Education*, v. 54, October 26, 2007, p. A42.

[4] Demographic data from Cleveland State University is from Fall 2008. Therefore, the total number of undergraduate students in Table 3 differs from actual Spring 2010 undergraduate enrollment in Table 2.

[5] Percentages are based on a total of 171 IEL students enrolled the University of Akron and Kent State University. Detailed Spring 2010 demographic information for IEL students at Cleveland State University was unavailable and therefore not included.

[6] See Bekhradnia and Vickers, *The Economic Costs and Benefits of International Students*, NAFSA *The Economic Benefits of International Education to the United States for the 2007-2008 Academic Year* and Roslyn Kunin & Associates, *The Economic Impact of International Students at Public Post-Secondary Institutions*. These studies assume that international undergraduate students remain in the host region for the full academic year but not the full calendar year.

[7] The survey did not ask international students the exact dollar amount of local assistance. Students were asked to mark the various categories to which their local assistance applied. Since the actual proportion of tuition costs covered for every student receiving local funding is unknown, assuming that 100% of these costs are covered is the most conservative estimate.

[8] The *Open Doors* report on international students in the U.S. and U.S. students abroad is published annually by the Institute of International Education (IIE) through a grant from the U.S. Department of State. *Open Doors 2009* is based on data for the 2008-2009 academic year. An analysis of international student expenses by Jason Baumgartner of Indiana University and NAFSA: The Association of International Educators using *Open Doors* data is published on IIE's website at <http://opendoors.iienetwork.org/page/150863/>

<sup>[9]</sup> The BEA describes distribution or transportation costs as consisting of the costs of transporting the output from the manufacturers to the wholesaler and from the wholesaler to the retailer. Thus these costs are negligible in the service industry. Please refer *Regional Multipliers A User Handbook for the Regional Input-Output Modeling System* (BEA, 1997).

<sup>[10]</sup> The employment multiplier is computed as the number of jobs generated in an industry per \$1 million change in final demand in that industry

<sup>[11]</sup> State Support (SSI) includes State Share of Instruction, Access Challenge, Success Challenge, and Special Supplements for Central State University and Shawnee State University, but excludes state financial aid. See Ohio Board of Regents, *Cost and State Support Per FTE in Higher Education*, 2010.