

Educational Exchange Programs' Impact on Foreign Direct Investment

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Abstract – Job creation, specifically through foreign direct investment, is extremely important for states in providing jobs for their citizens. This study determines ways to increase foreign direct investment, this study analyzes the impact foreign exchange students participating in educational exchange programs has on the number of jobs created by foreign companies. After running multivariate regression analysis methods with several independent control variables, it was found that there is a significant, quantifiable correlation between the number of exchange students participating in the J-1 Visa program and the amount of jobs created in each state.

Key Words – foreign direct investment, exchange programs, jobs creation, educational exchange

INTRODUCTION

In the United States, policy-makers at both the federal and state level are constantly looking for ways to increase the number of jobs available to its citizens. States are often competing with one another to become the most attractive to potential companies looking to expand their operations. Typically, these companies are foreign, and are looking to open new manufacturing plants/sales offices in the United States to expand their market. To be more competitive, states need to use every institution available to persuade foreign companies to expand and create jobs for local citizens. Many states are already competing in a number of areas, for example by lowering tax burdens and becoming right to work states, yet considerably less attention has been given to the largest institutions in America, schools and universities, until recently [1]. The extent to which educational institutions can be harnessed to entice foreign companies to invest in America, has only received limited attention in research. As such there remains uncertainty around the impact schools and universities have on job creation by foreign companies, which makes it more difficult for policy-makers to conduct adequate cost-benefit analyses. This difficulty can explain why many states have been reluctant to tap into any job-creating potential of schools and universities. This study attempts to contribute to the nascent literature by considering the extent to which increasing the scope of international exchange programs can contribute to the expansion of foreign-owned companies in a given state and/or region. To investigate this pertinent topic and bring it to the data, the

paper addresses the following question: to what extent does the number of international exchange students participating in educational exchange programs impact the number of jobs created by foreign companies?

LITERATURE REVIEW

The federal nature of the system of governance in the United States grants decision makers at the state level wide discretion over policies which have a direct impact on the number of exchange students. These measures include partnering with educational institutions and companies and encouraging more program sponsors for the J-1 Visa program. It is natural therefore that policy makers seeking to find efficient and innovative ways to support the local economy and attract both foreign talent and investment would be vitally interested in understanding the precise relationship between the flow of exchange students and job creation by foreign firms.

In the case of international students who are enrolled in full-time higher education, a number of studies such as [2][3] have drawn a link between international student mobility and socio-economic outcomes, with higher student mobility being found to be an important channel for high-skilled immigration who generally are considered to have high social capital which in turn can act as an aid for stimulating exchange in ideas and technology across countries, thereby encouraging FDI [4]. However it is unclear the extent to which these arguments are directly applicable to exchange students due to the temporary nature of their stay.

Furthermore, a recent study by [5] analyzed the effects of international students on inbound FDI into the UK and US and found a significant and positive impact, with educational networks being emphasized as a key factor in explaining the causal mechanism for more foreign students stimulating inbound FDI. It has been hypothesized that such networks among international students act as important means through which information regarding economic opportunities in the host country is relayed back home. In a similar vein, [6] analyze the link between German migration and FDI, with their results offering broad support for the importance of cultural linkages in stimulating investment from abroad.

Applying these findings to the American setting and the present analysis, the large proportion of foreign high-school and university exchange students arriving on the J-1 visa each year is likely to form an important educational

network which acts as a catalyst for inward FDI. Moreover, [6] argue that such linkages provide incentives for migrants and firms to locate in specific areas, emphasizing that not only are effects of interest at the national level but also that individual states will want to reflect on how best to capitalize on any FDI-stimulating effects of state-initiated educational exchange programs to gain a competitive advantage.

DATA

The two main independent variables of interest in this study are the number of international exchange students participating in educational exchange programs in the United States at college and high school level. For both measures, we use the number of international college students on educational exchanges in each individual state arriving under the J-1 Visa in 2018. This data comes from the United States State Department online database. The dependent variable in our analysis is the number of jobs created by foreign companies in each respective state. These values were provided by SelectUSA, the U.S. government program that measures and promotes foreign direct investment in the United States. Figure 1 shows a scatterplot of the dependent variable against the total number of international exchange students in 2018. The R^2 value is 0.85, indicating a strong positive correlation.

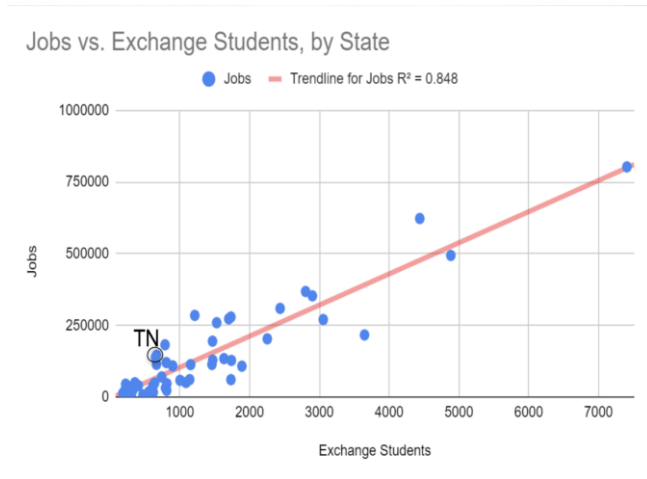


FIGURE 1: Jobs versus exchange students by state.

ANALYSIS

While Figure 1 depicts an extremely high correlation between the number of international exchange students and jobs created by foreign companies, the model does not control for other confounding factors. This means that Figure 1 can not confidently depict a significant relationship between the number of exchange students and job creation. In an attempt to address this problem, multivariate regression models were developed using key independent control variables confirmed by the Tennessee Department of Economic and Community Development to directly impact foreign direct investment. These variables are shown in Table 1 below.

TABLE 1: Control variables for regression analysis.

Control Variable	Source	Comment
Population	United States Census Bureau	Population of each respective state
Purchasing Power of the Dollar	Bureau of Economic Analysis	Power of the USD in each respective state
Tax Burden	ALEC-Laffer State Economic Competitiveness Index	Measured per \$1000 income; compiled variable
Average Occupational Wage	Bureau of Labor Statistics	Average occupational wage for each state
Corporate Tax Rate	Tax Foundation	Corporate tax rate in each respective state
Right to Work State	Workplace Fairness Organization	Right-to-work laws of each respective state
Northeast	United States State Department	Dummy Variable; Midwestern states being control
South	United States State Department	Dummy Variable; Midwestern states being control
West	United States State Department	Dummy Variable; Midwestern states being control

Through multivariate regression analysis methods, we are able to predict how the number of jobs created by foreign companies is impacted by the number of exchange students by taking into account the contribution of the various control variables depicted in Table 1. Figure 2 shows the regression equation used to create the multivariate regression model. In this equation, α refers to the constant in the regression. The β_1 and β_2 represent the coefficients of interest of the college exchange student and high school exchange student variables. The X_i represents the vector containing the independent control variables, and the δ represents each control variable's respective coefficients. Finally, ε_i represents the residual, or what our model cannot explain.

$$\text{ForeignJobs}_i = \alpha + \beta_1 \text{College}_i + \beta_2 \text{Secondary}_i + X_i \delta + \varepsilon_i$$

FIGURE 2: Equation for the multivariate regression model.

Through this equation, and by using data from the variables depicted in table 1, we were able to create our multivariate regression model, as shown in Table 2.

TABLE 2: Multivariate regression model.

Regression Analysis:				
Regression Statistics				
Multiple R	0.973310665			
R Square	0.9473336507			
Adjusted R Square	0.9320881285			
Standard Error	42582.39664			
Observations	50			
ANOVA				
	df	SS	MS	F
Regression	11	1239405866651	112673260605	62.13848499
Residual	38	68903899149	1813260504	
Total	49	1308309765800		
	Coefficients	Standard Error	t Stat	P-value
Intercept	223933.8695	344053.7852	0.6508687862	0.5190477497
College	42.03226243	13.60181892	3.090194236	0.00373240024
Secondary	47.28195513	22.99170537	2.05647882	0.0466505875
Population	0.01338773163	0.002381602918	5.621311399	0.0000018829294
Purchasing Power of Dollar	-150719.3268	201306.9701	-0.7487039656	0.4586451074
Tax Burden	-213.9546662	625.2852843	-0.3421712802	0.734107331
Average Occupational Wage Rate	-0.5677741162	2.543546047	-0.2232214812	0.8245587772
Right to Work State	-17721.24947	23621.83242	-0.7502063834	0.4577505414
Corporate Tax Rates	-2489.684114	2529.951657	-0.9840836708	0.3312989228
West	-44096.64454	23557.5951	-1.871865288	0.0689372285
Northeast	5154.512704	27124.78239	0.1900296427	0.8502974093
South	16614.90866	20956.46102	0.7928298889	0.4327992988

As depicted in these tables, the p-value was below 5% for both college international exchange students and high school international exchange students, indicating that there is a *significant* correlation between the number of international exchange students participating in educational exchange programs and job creation by foreign companies. The respective coefficients can be interpreted as the number of jobs created by foreign companies for each one unit increase in a given independent variable. Therefore, the multivariate models suggest that every additional college exchange student is associated with the creation of 42 new jobs and every additional high-school exchange student is associated with the creation of 47 new jobs. These coefficients were then used to predict the number of jobs created by foreign companies, and were plotted against the actual number of jobs created by foreign companies in Figure 3.

FIGURE 3: Predicted versus actual foreign jobs by state.

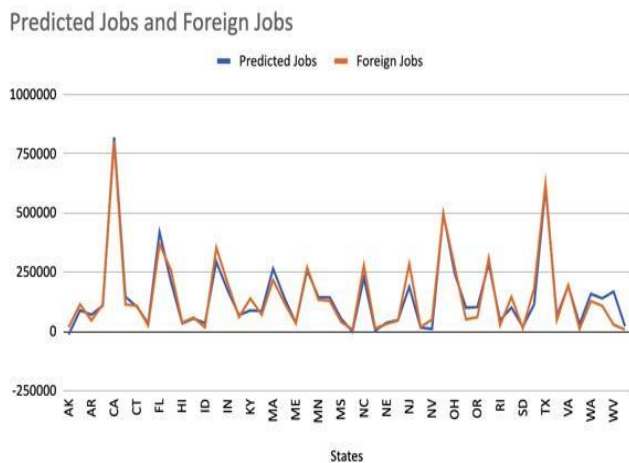


Figure 3 shows that the model we have constructed has very high predictive power, explaining approximately 94% of the variation in foreign job creation across states. This is important because it reinforces the notion that educational programs have a palpable effect on job creation through tangible coefficients that depict the exact numerical impact international exchange students actually have on job creation by foreign companies

DISCUSSION AND LIMITATIONS

However, there are a few limitations to the multivariate regression analysis used in this study. First of all, the coefficient values for both college exchange students and high school exchange students are fairly large. The coefficient is admittedly likely to be biased upwards due to omitted variables. However we argue that the values may not be as implausible as they first seem because the effect one exchange student has on the number of jobs created by foreign companies is amplified through educational network effects, as outlined in the literature review section.

Furthermore, despite our attempts to control for possible endogeneity through the use of a rich set of control variables, the multivariate regression analysis cannot confidently determine the direction of causality. Ideally, if we had data from more time periods, we could run a fixed effects model. This would have been preferable and would have been more informative about the causal relationship as we could have controlled for fixed effects; however, we were unable to model in this fashion due to the fact that the data for the College/University and Secondary Student J-1 Visa subcategories was only made available very recently because of the recent creation of these respective subcategories. We therefore leave this task to future research. Also, based on the regression analysis, it is not entirely clear what mechanism is driving the relationship between exchange students and job creation. This can be addressed in future studies through more detailed surveys of both college and high school international exchange students to understand the nature of the network effect and to gauge exactly how big of an impact this trend could have on job creation by foreign companies. Despite these setbacks, the multivariate analysis methods used in this study still depict a strong, significant correlation between the number of international exchange students and jobs created by foreign companies.

CONCLUSION

In conclusion, it was found that the correlation between the number of college and high school international exchange students and the number of jobs created by foreign companies is extremely high and determined to be significant. It was also found that the coefficient values attributed to both high school and college exchange students are proven to be reliable in predicting job creation by foreign companies. While this study determines a strong correlation but not necessarily a causal relationship between foreign job creation and exchange students, the study can serve as a great segway for deeper research and analysis to determine causality between foreign direct investment and exchange programs. In conclusion, states across the U.S. should actively partner with educational institutions and companies to increase the number of exchange programs in order to make the United States even more attractive for foreign companies.

ACKNOWLEDGEMENTS

Tennessee Department of Economic and Community Development, University of Tennessee, University of Memphis, Japanese Consulate Office.

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