



2007

Exploring the Effects of Age at Arrival and Region of Origin on the Earnings of Immigrant Physicians in the U.S.

Matthew Goergen '07
Illinois Wesleyan University

Follow this and additional works at: https://digitalcommons.iwu.edu/econ_honproj



Part of the [Economics Commons](#)

Recommended Citation

Goergen '07, Matthew, "Exploring the Effects of Age at Arrival and Region of Origin on the Earnings of Immigrant Physicians in the U.S." (2007). *Honors Projects*. 3.

https://digitalcommons.iwu.edu/econ_honproj/3

This Article is protected by copyright and/or related rights. It has been brought to you by Digital Commons @ IWU with permission from the rights-holder(s). You are free to use this material in any way that is permitted by the copyright and related rights legislation that applies to your use. For other uses you need to obtain permission from the rights-holder(s) directly, unless additional rights are indicated by a Creative Commons license in the record and/ or on the work itself. This material has been accepted for inclusion by faculty at Illinois Wesleyan University. For more information, please contact digitalcommons@iwu.edu.

©Copyright is owned by the author of this document.

Exploring the Effects of Age at Arrival and Region of Origin on the Earnings of Immigrant Physicians in the U.S.

Matt Goergen

I. Introduction

Current projections, as indicated by the 2000 Census, suggest that racial and ethnic minorities will outnumber non-Hispanic whites in America by the year 2050. Clearly, immigrants are vital components of the U.S. labor force and crucial in helping drive the domestic economy. Foreign-born workers occupy all niches of the labor market, from low-skilled workers to physicians, yet there still exists a disparity in wages between immigrant and native workers.

Immigrant physicians made up nearly 25% of all physicians practicing in the U.S. in 2003, a figure that was around 17% in 1970 (Pasko & Smart, 2005). Considering the mass influx of foreign physicians into the U.S. over the last several years, it is important to examine what factors are responsible for the difference in wages between immigrant and native physicians. A plethora of previous studies looking at the factors affecting wages of all native and immigrant workers are rather copious and conclude that current immigrants face lower wages than natives (Borjas, 1994). Studies looking precisely at wage differentials between immigrant and native physicians, however, are in short supply. This study aims to determine some important determinants of the wage differential between native and immigrant physicians by applying a human capital framework and employing Ordinary Least Squares (OLS) regression analysis. Specifically, the study determines if the age at arrival and the region of origin have significant impacts on the subsequent earnings of immigrant physicians in the U.S. Section II of the paper details the human capital

theoretical framework that is central to this study and that is used in the most important previous literature. Then, this literature is discussed in the context of the research problem that immigrant physicians earn substantially less than native physicians in the U.S. The principle hypotheses are also developed following the theory and literature review. Section III describes the data set and the empirical model that is employed to test the hypotheses. Section IV presents the results obtained from the regression model and discusses important findings. Section V concludes the paper with policy implications and avenues for future research.

II. Theory and Review of the Literature

According to human capital theory, workers receive different wages because all workers possess different sets of skills and abilities that can be contributed to the workforce. In other words, workers have different amounts of human capital. Generally, human capital is acquired through education and training programs. Schooling, for example, adds to an individual's knowledge "stock", which gives the individual increased skills and abilities which can be used in the labor market. On-the-job training programs, likewise, present workers with an increase in acquired skills that can be used to earn income, more income than could have been earned without the training (Borjas, 2005).

In the field of immigration economics, Barry Chiswick's article "The Effect of Americanization on the Earnings of Foreign-Born Men" (1978) is regarded as a seminal piece. The study employs a human capital framework to test for earnings differentials due to country of origin, years in the U.S., and citizenship. The study

finds that although immigrants initially earn less, their earnings rise more rapidly and eventually overtake the earnings of native men. The mechanism behind this phenomenon is the “Americanization effect,” or, in other words, the ability of immigrants to assimilate into the U.S. labor market. It can then be deduced that recent immigrants, having fewer U.S. specific skills, will earn less than natives, *ceteris paribus*. Yet, as immigrants develop U.S. specific skills through labor market experience, their earnings will rise and, according to Chiswick (1978), overtake those of the natives.

Human capital theory maintains, as reflected in Chiswick’s (1978) model, that years of schooling be “decomposed” into years of schooling before and after immigration into the U.S. Similarly, years of labor market experience must be broken down into experience before and after immigration. By doing this, U.S. specific skills are assessed rather than a vague measure of general skills. Years of schooling, as well as experience, after immigration to the U.S., should make immigrants more equipped for the U.S. labor market than education and experience before immigration. Rachael Friedberg (1996) assesses this phenomenon, termed the portability of human capital, in her paper, “You Can’t Take It with You? Immigrant Assimilation and the Portability of Human Capital.” The study finds that foreign and domestic human capital may not in fact be close substitutes. Education and labor market experience acquired within a host country is more valuable to the immigrant, in terms of earnings, than that acquired abroad. Therefore, natives generally earn more than immigrants because they possess country-specific skills that the immigrants initially

lack. Earnings parity can be achieved, though, the longer immigrants reside in the host country and develop the country-specific skills.

These results raise the question of whether specific regions of origin have more portability of skills problems than others. Considering physicians, different regions may offer medical training and education that are not equally transferable into the U.S. In fact, many medical schools abroad are influenced by the “Western aspirations” of their students, resulting in education and training that may not be well aligned with local levels of technology and patterns of disease in that region (Mullan, 2005). Consequently, graduates find themselves dissatisfied with the opportunities presented in their home countries so they seek opportunities abroad. America is a major recipient of these foreign-trained physicians, with the major source countries being India, Canada, and the Philippines (Mullan, 2005). So, does the region of origin make a difference in relative physician earnings in the U.S.? Chiswick (1978) finds that immigrants from English-speaking countries perform better in the U.S. than immigrants from non-English-speaking countries. These outcomes suggest that the skills acquired by immigrants from English-speaking countries are more transferable into the U.S. Therefore; human capital is more portable into the U.S. from some regions than it is from others.

Seeborg and Sanford (2003) find results that are very similar to those of Chiswick and Friedman. They find that immigrants who arrive in the U.S. earlier perform similar, in terms of earnings, to natives. Furthermore, they find that the earlier arriving immigrants acquire more U.S. specific human capital than later arrivals, yielding earnings that are more similar to those of the natives. In accordance

with Chiswick's notion of the "Americanization effect," the study finds that early arrivals actually outperform natives, who on average earn \$1,292 per year more than natives after controlling for language, education, and hours worked. Conversely, later arriving immigrants, those with less U.S. specific human capital, earn \$7,396 less annually than natives on average. These findings illustrate the significance of age at the time of arrival on subsequent earnings for immigrant workers in the U.S.

Another variable used in studying the causes of wage differentials between immigrants and natives is citizenship status. Chiswick (1978) finds that earnings are not related to citizenship status. Moreover, alien versus naturalized citizen status does not affect earnings despite the theoretical evidence that aliens should earn less than permanent citizens. He claims that aliens earn less only in the instances where they have been in the country for less time than the citizens. Temporary migrants, for example, would spend less time than permanent residents in acquiring U.S. specific human capital. This was tested by holding years since migration constant and observing that there is no significant difference in earnings between the two groups.

George Borjas, a former Cuban refugee himself, is a very prominent figure in the field of immigration economics and criticizes Chiswick's (1978) work for its failure to consider cohort effects. He argues (Borjas, 1994 p. 1672) that waves (or generations) of immigrants may be inherently different in terms of skills and abilities and that wage convergence between immigrants and natives cannot be explained by a "positive cross-section correlation between the relative wage of immigrants and years-since-migration." He explains that a change in immigration policy, such as the preferential selection of more-skilled immigrants, creates cohort effects. Also, newer

waves of immigrants are less skilled. These differences, he argues, could be responsible for the differential earnings among various waves of immigrants as opposed to actual wage convergence of the immigrants with natives as cross-sections would suggest. This critique, however, is not relevant for this study because there are no cohort effects for immigrant physicians. All waves or generations of physicians should be uniform in terms of education levels and skills, so it is acceptable to use Chiswick's cross-sectional data approach. Theoretically, though, wages are dependent on if any of the education was obtained inside the U.S. because this education is a form of U.S. specific human capital. If foreign physicians are trained abroad using certain technology and then forced to use the U.S. specific technology upon migration, these physicians will have less U.S. specific skills, leading to fewer perceived skills, in effect. Thus, it is appropriate to look not only at acquired skills, but also acquired skills that are specific to the host countries.

To what extent does specialty matter in determining the earnings of immigrant physicians in the U.S.? Pasko and Smart (2005) point out that in 2003, there were a higher percentage of immigrant physicians compared to U.S. physicians in primary care specialties. Primary care consists of family medicine, general practice, internal medicine, and pediatrics. Furthermore, 95.8% of foreign physicians were in patient care in 2003, with 60% in internal medicine (Pasko & Smart, 2005 p.59). According to the Medical Group Management Association (2005), physicians in primary care earn less than in other specialties, such as anesthesiology and general surgery. Therefore, the wage differential between native and immigrant physicians could possibly be explained by the fact that immigrant physicians enter less monetary-

rewarded medical specialties than natives. This conclusion, however, is not qualified by previous studies and should be explored in more detail for future research.

Following the theory of human capital, it is hypothesized that early arrival immigrant physicians earn wages comparable to those of natives. Moreover, human capital acquired in the U.S. helps immigrant physicians reach earnings parity with natives. In addition, immigrants from some regions should earn more than immigrants from other regions. This is because particular regions produce human capital that is more transferable into the U.S. than others. Immigrant physicians are trained differently in different regions of the world. Notably, the technology and techniques used in the training process may be different from those in the U.S. Therefore, immigrant physicians may have equal abilities, training, and education as native physicians, but not equal U.S. specific skills. This difference, therefore, is hypothesized to be responsible for the wage differentials between immigrant and native physicians.

III. Data and Empirical Model

To test the hypotheses that early arrival immigrant physicians face higher earnings than later arrivals due to the acquisition of more U.S. specific skills, and that some regions yield more portable human capital, data from the five percent sample of the 2000 Integrated Public Use Microdata Series (IPUMS) census database were used. This data set is problematic due to the “top-coding” of the earnings figures at higher incomes, which does not allow for a complete investigation of the existing wage differentials. Yet, there are sufficient observations below the top-code that

make the analysis possible. The top-code itself is set at \$175,000 in the IPUMS data set. Any earnings above this value are reported as the mean of all earnings exceeding the top-code from all individuals in the given physician's state of residence.

To further focus the study, only physicians under the age of 40 are included. This creates less of a top-code problem. Also, only physicians under 40 are looked at because this is generally the age by which physicians have finished residency programs and are relatively early in their career. Additionally, more than two-fifths of all physicians practicing in the U.S. in 2003 were under 45 (40.2%) (Pasko & Smart, 2005 p. v). Finally, only physicians working 40 or more weeks are included in the study. Therefore, part-time and non-practicing physicians are excluded to focus only on full-time, practicing physicians. The variables used in this study, along with their predicted signs, are defined in Table 1.

All of the origin-related variables are predicted to be negative because immigrant physicians are expected to earn less than natives regardless of source country, *ceteris paribus*. These regions were selected for study because the majority of immigrant physicians in the sample came from these regions. Also, Mullan (2005) finds that the U.S. is a major beneficiary of large-scale immigration from these regions. OTHER is a variable that ensures the results are relative to only native physicians by controlling for immigrants from all other regions of the world who enter the U.S.

Table 1: Variable Definitions and Predicted Signs

Variable	Definition
Dependent:	
WAGES	Total pre-tax wage and salary income from the previous year (1999)
Independent: Origin-Related	
CANADA (-)	Dummy variable equal to 1 if physician emigrated from Canada, 0 otherwise
INDIA (-)	Dummy variable equal to 1 if physician emigrated from India, 0 otherwise
EUROPE (-)	Dummy variable equal to 1 if physician emigrated from Europe, 0 otherwise
AFRICA (-)	Dummy variable equal to 1 if physician emigrated from Africa, 0 otherwise
LATIN AMERICA (-)	Dummy variable equal to 1 if physician emigrated from Latin America, 0 otherwise
PHILIPPINES (-)	Dummy variable equal to 1 if physician emigrated from the Philippines, 0 otherwise
CHINA (-)	Dummy variable equal to 1 if physician emigrated from China, 0 otherwise
OTHER (-)	Dummy variable equal to 1 if physician emigrated from a region not already listed besides U.S. territories, 0 otherwise
Independent: Age-Related	
AGE (+)	Individual's age in years
0-12 (+)	Dummy variable equal to 1 if physician's age at immigration into U.S. is between 0 and 12, 0 otherwise
13-18 (-)	Dummy variable equal to 1 if physician's age at immigration into U.S. is between 13 and 18, 0 otherwise
19-30 (-)	Dummy variable equal to 1 if physician's age at immigration into U.S. is between 19 and 30, 0 otherwise
31-40 (-)	Dummy variable equal to 1 if physician's age at immigration into U.S. is between 31 and 40, 0 otherwise
Independent: Other	
GENDER (-)	Dummy variable equal to 1 if female, 0 otherwise
WKSWORKED (+)	Number of weeks worked in the previous year (1999)

The age-related variables are defined according to ages at specific stages of schooling. These variables represent the times in which immigrants develop U.S. specific skills that add to WAGES, the dependent variable. The longer one lives in the U.S., the more he/she is acquiring these skills. The age-related variables reflect the acquisition of these human capital investments both before and after migration into the U.S. In order to treat natives, age is included and reflects years spent in the U.S.

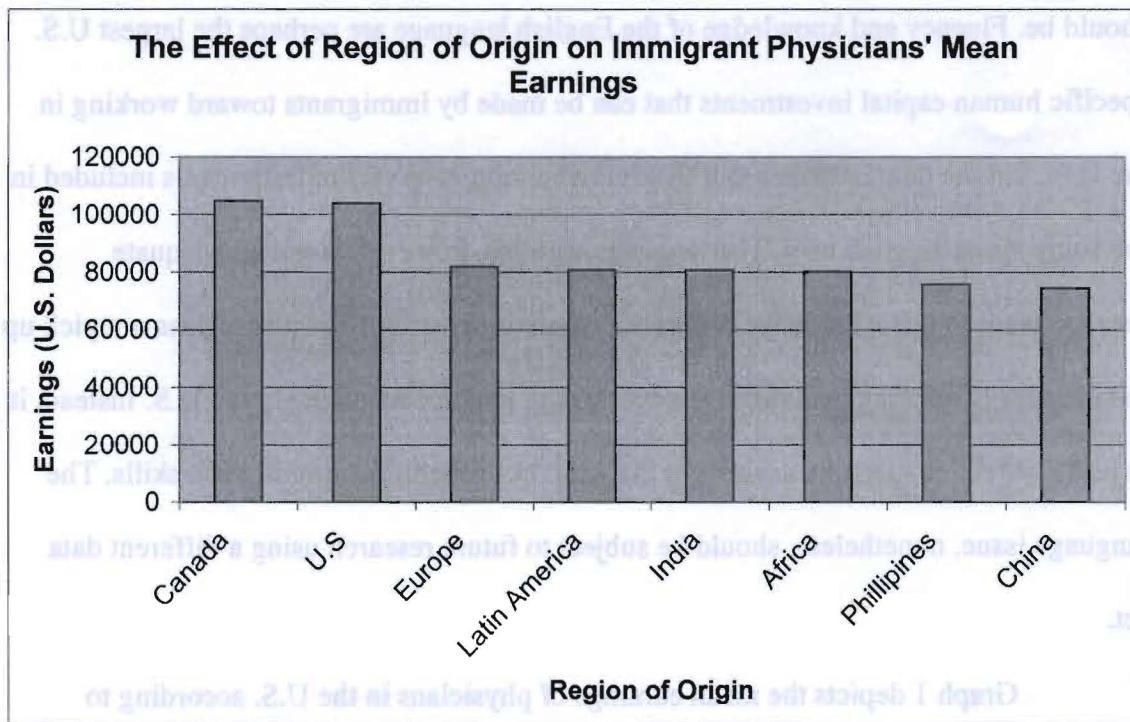
The 0-12 variable reflects ages before entering high school. It is predicted to be positive because these individuals not only have U.S. specific human capital similar to natives since they arrive in the U.S. before entering high school, but they also possess multiculturalism and possibly bilingualism. These factors are expected to result in a labor market reward, as found by Seeborg and Sandford. (2003) The 13-18 variable reflects an age when one is in high school. This is predicted to be negative because these immigrants may have a difficult time adapting to and realizing the “Americanization effect” quickly. Therefore, they possess a considerably reduced amount of U.S. specific capital compared to natives and immigrants who arrived as children, or, in other words, before the age of 12. The 19-30 variable represents the general age of an individual enrolled in college, from undergraduate through medical school. This is predicted to be negative since these immigrants have considerably less U.S. specific human capital than both natives and the earlier arrivals, resulting in an earnings reduction. Likewise, 31-40 is expected to be negative and represents individuals who have already completed medical school and then immigrate into the U.S. Also, control variables such as gender and the number of weeks worked during the 1999 sample period are included.

Language proficiency is not included despite the theoretical suggestions that it should be. Fluency and knowledge of the English language are perhaps the largest U.S. specific human capital investments that can be made by immigrants toward working in the U.S., but the data indicates that the overwhelming majority of individuals included in the study speak English well. The language variable, however, is not an adequate measurement to get at language differences among physicians because it does not pick up the nuances of the English language necessary to practice medicine in the U.S. Instead, it is just a vague language measurement that conveys general communication skills. The language issue, nonetheless, should be subject to future research using a different data set.

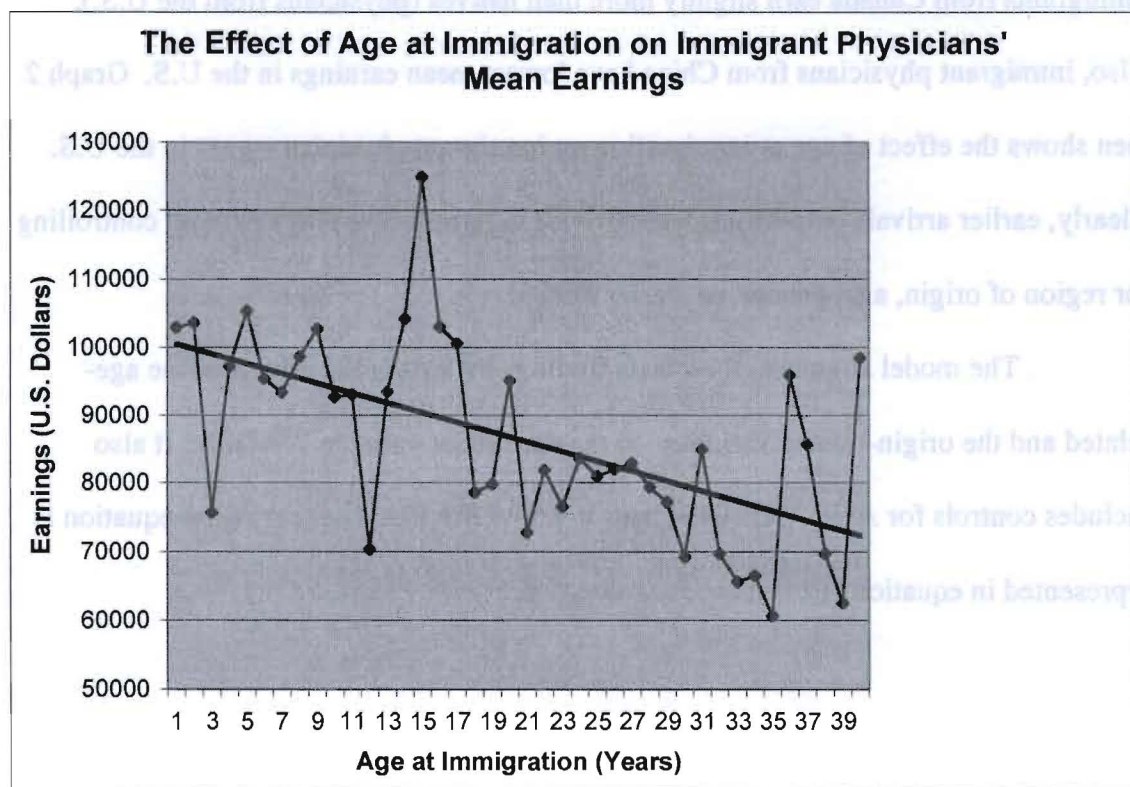
Graph 1 depicts the mean earnings of physicians in the U.S. according to region of origin. Without controlling for age, age at arrival, gender, or weeks worked, immigrants from Canada earn slightly more than natives (physicians from the U.S.). Also, immigrant physicians from China have lowest mean earnings in the U.S. Graph 2 then shows the effect of age at immigration on immigrant physician wages in the U.S. Clearly, earlier arrivals outperform later arrivals in terms of earnings without controlling for region of origin, age, gender, or weeks worked.

The model augments these data findings by testing the effects of the age-related and the origin-related variables on the dependent variable WAGES. It also includes controls for AGE, GENDER, and WKSWORKED. The regression equation is represented in equation (1).

Graph 1:



Graph 2:



$$(1) \quad \text{WAGES} = \alpha + \beta_1(0-12) + \beta_2(13-18) + \beta_3(19-30) + \beta_4(31-40) + \beta_5\text{CANADA} + \beta_6\text{INDIA} + \beta_7\text{EUROPE} + \beta_8\text{AFRICA} + \beta_9\text{PHILIPPINES} + \beta_{10}\text{LATIN AMERICA} + \beta_{11}\text{CHINA} + \beta_{12}\text{AGE} + \beta_{13}\text{GENDER} + \beta_{14}\text{WKSWORKED}$$

The model uses an OLS regression to test the effects of the independent variables on the given dependent variable. An alternative analysis, perhaps using a censored regression model in the family of Tobit regressions, should be subject to investigation for future research in order to try and resolve the “top-code” issue.

IV. Results

The regression results, which are presented in Table 2, generally support the hypotheses that early arriving immigrant physicians earn wages similar to natives, and that immigrant physicians from particular regions earn more than from other regions. Table 2 presents the effects of the explanatory variables on the dependent variable WAGES.

As expected, some regions face greater earnings disadvantages than others, perhaps due to this transferability of skills problem. Unexpectedly, however, Canada faces no significant earnings disadvantages relative to natives after controlling for age, age at arrival, gender, and amount of weeks worked. This may be due to the fact that Canada is the most similar to the U.S. in terms of medical education, language, custom, and economic/political institutions. It is then reasonable to speculate that

Table 2: Native-Immigrant Wage Regression Results: Dependent = WAGES

Variable	
Independent: Origin-Related	
CANADA	-14,123
INDIA	-33,910*
EUROPE	-39,808**
AFRICA	-45,992**
PHILIPPINES	-47,454**
LATIN AMERICA	-49,632**
CHINA	-53,694**
OTHER	-32,189*
Independent: Age-Related	
AGE	9,770**
0-12	37,155**
13-18	638
19-30	-21,841**
31-40	-63,505**
Independent: Other	
GENDER	-24,816**
WKSWORKED	975**
Adjusted R ²	0.172
Sample Size	10,225
* Indicates variables significant at .05 level	
** Indicates variables significant at .01 level	

immigrant physicians from certain regions face a lower transferability of skills problem than from other regions because some regions are more similar to the U.S. Immigrant physicians from China and Latin America face the greatest disadvantage in relative earnings, perhaps due to these countries being the most dissimilar to the U.S. and facing the greatest portability of skills problems. Chinese physicians, for example, earn \$53,694 less than native physicians in the U.S., *ceteris paribus*. This enormous earnings disadvantage could stem from the fact that China still mixes homeopathic and Western medicine techniques in their medical education and training, producing skills much different from those acquired in the U.S. Therefore, physicians coming from China may be equally trained and educated, but possess less U.S. specific skills relative to natives, resulting in earnings disadvantages. Similarly, immigrants from all the other tested areas (India, Europe, Africa, Philippines) face significant reductions in earnings after controlling for age, age at the time of immigration, gender, and weeks worked.

The age-related independent variables present some interesting results. As expected, immigrant physicians who arrive before the age of 12 have significant earnings advantages over natives, *ceteris paribus*. This result is in agreement with the findings of Seeborg and Sanford (2003) and could possibly be explained by an added labor market reward for multiculturalism and bilingualism. These individuals arrive in the U.S. before high school, so they attain much of the same education and labor market experience as the natives. Perhaps, the multiculturalism and possible bilingualism they possess better equip them to deal with a rapidly growing and diverse population in the U.S. and result in higher earnings.

Unexpectedly, those whose age at arrival is between 13 and 18 do not have earnings that are significantly different from native physicians. This may be because these immigrants arrive in the U.S. while in high school and still manage to acquire much human capital inside the U.S. Accordingly, their earnings are on par with the natives. Later arriving immigrants, on the other hand, face significant earnings disadvantages after holding region of origin, age, gender, and weeks worked constant. In particular, immigrants arriving between the ages of 31 and 40 earn \$63,505 less than natives, *ceteris paribus*. This earnings reduction may be attributed to the lack of U.S. specific human capital these physicians possess.

These results suggest that extra time spent living in the U.S. does actually add to the attainment of U.S. specific skills through the “Americanization effect” that Chiswick (1978) proposes. This coincides with previous studies on immigrants, such as Friedberg (1996), which obtain similar results for other occupations, and finds that human capital in the form of medical training inside the U.S. is much more beneficial to immigrant physicians than training abroad in terms of earnings.

Again, the age-related independent variables are the best proxy for the acquisition of U.S. specific skills since the more time an individual resides within the U.S., the more country-specific skills he/she will attain. All of the coefficients except for the 13-18 age at arrival variable possess the hypothesized signs and are significant to the 0.01 percent level. The model yields an adjusted R-squared value of 0.172, indicating that 17.2 percent of the variation in WAGES is explained by the model. Future research should use a censored regression model to test if it lessens “top-coding” problem. The top-coded

earnings values distort actual wage representations and may have lowered the R-squared value.

This model also presents another surprising result. Although the coefficient on the GENDER variable has the anticipated negative sign, the magnitude of the coefficient is striking. It suggests that being a female results in \$24,816 less earnings than being male, *ceteris paribus*. This alarming result points to obvious causes of wage disparities that still exist in the American society and should be subject to future research. The effect that being a female immigrant has on earnings could be investigated, for example, to test if the interaction between these variables further reduces earnings.

To illustrate the effects that region of origin and age at immigration have on earnings, Table 3 presents the simulated earnings for 40 year old immigrant male physicians working 51 weeks under different age at arrival and region of origin scenarios. The age of 40 is chosen to estimate earnings because it is the only age that includes all ages at immigration for the given scenarios. For example, if the age of 35 were chosen for the estimation, immigrants who arrived in the U.S. when they were 38 would not be accurately represented. The earnings projection would assign some later arriving immigrants ages below their ages at the time of immigration, which gives rise to conceptual difficulties. Also, 51 weeks worked is chosen because it is the mean number of weeks worked for all the immigrant physicians in the sample. Finally, the difference in earnings from a native physician is presented in parentheses.

Table 3 shows that both age at immigration and region of origin matter in determining immigrant physician wages. Strikingly, the table shows that immigrants from Canada and India who arrive in the U.S. before the age of 12 actually outperform natives

in terms of earnings. This result is in general agreement with the findings of Chiswick (1978) and Seeborg and Sanford (2003). Specifically, the “Americanization effect” appears to be present today, even among high-skilled physicians. Early arrival immigrant physician wages do actually rise above those of the natives, but only when immigrating

Table 3: Estimated Earnings (in U.S. Dollars) of 40 Year Old Immigrant Male Physicians Working 51 Weeks by Age of Arrival and Country of Origin (Difference from Native Physicians in Parenthesis)

Regions	Age at Immigration			
	0-12	13-18	19-30	31-40
Canada	222,272.51 (+23,032.56)	185,755.10 (-13,484.8)	163,275.30 (-35,964.6)	121,611.14 (-77,628.8)
Europe	196,587.55 (-2,652.40)	160,070.14 (-39,169.8)	137,590.33 (-61,649.6)	95,926.18 (-103,313)
India	202,485.50 (+3,245.55)	165,968.09 (-33,271.8)	143,488.29 (-55,751.6)	101,824.13 (-97,415.8)
Africa	190,403.58 (-8,836.37)	153,886.17 (-45,353.7)	131,406.37 (-67,833.5)	89,742.21 (-109,497)
Philippines	188,941.17 (-10,298.78)	152,423.76 (-46,816.2)	129,943.95 (-69,296.0)	88,279.79 (-110,960)
Latin America	186,763.38 (-12,476.57)	150,245.97 (-48,993.9)	127,766.17 (-71,473.7)	86,102.01 (-113,137)
China	182,701.18 (-16,538.77)	146,183.77 (-53,056.1)	123,703.96 (-75,535.9)	82,039.80 (-117,200)

into the U.S. from Canada and India. It is then reasonable to speculate that immigrant physicians from these regions face a lower transferability of skills problem than those from other regions because these regions are more similar to the U.S. The medical education is given in English, for example, in both Canada and India. Also, upon arrival,

immigrants gain knowledge of the language, customs, and nature of the labor markets which eventually lead to higher earnings. Canada and India are more similar to the U.S. in this regard, so skills from those regions may be more portable into the U.S.

Conversely, a Chinese physician who entered the U.S. between the ages of 31 and 40 earns \$117,200 less than a 40 year old native working 51 weeks a year. This clearly highlights the effects that region of origin and age at immigration have on earnings. Coming from China and arriving after the age of 30, perhaps because it is the most dissimilar to the U.S., results in the largest earnings disadvantage in the U.S. These physicians have the least U.S. specific human capital and their skills are the least transferable into the U.S. labor market.

V. Conclusion

The findings of this study indicate that early arrival immigrant physicians, as well as immigrants from regions most similar to the U.S., earn wages comparable to those of the natives. One possible explanation for this result is living in the U.S. allows individuals to develop U.S. specific skills that can be applied directly in the labor market. Surprisingly, though, immigrants arriving before the age of 12 earn \$37,155 more than natives, *ceteris paribus*. When considering region of origin, only Canadian and Indian early arrivals have wages that surpass the natives. Chinese physicians arriving between the ages of 31 and 40 face the greatest earnings disadvantage in the U.S. Likewise, females receive considerably less earnings than males. It would be interesting to test the effects of being a female immigrant physician on earnings for future research to determine if there is a further reduction associated with being in both of these minority

groups. In addition, despite supporting the hypotheses that immigrants earn less due to less U.S. specific skills and that some regions produce skills that are more transferable into the U.S. than others, the model offers a relatively low R-squared value that could be improved by eliminating top-coded values in the data or reevaluating the use of a different model.

Given they are crucial causes of wage differences between immigrant and native physicians, age at immigration and region of origin should be considered when developing immigration policy. A research implication and avenue for future research is to look at region of origin more carefully. For example, Europe is not uniform in terms of language, customs, education, and political/economic systems. Later research should separate European countries by similarities and differences to the U.S. in order to better test the effects of region of origin on immigrant physicians' earnings. Also, this study finds that different regions have skills that are more portable into the U.S., but does not consider what exactly it is about the different regions that affect earnings. The explanations offered are purely speculative. This country-specific analysis should be subject to future research.

The next logical step for this research agenda is to investigate why these earnings differences exist now that it has been established that age at arrival and region of origin matter. This sort of investigation requires a different data set that includes more detailed information on specialty, medical school characteristics, and English language proficiency. Data on physician specialty would illustrate the extent to which specialty matters in determining physician wages. Medical school characteristics can also be useful in examining differences in education, which could affect subsequent earnings. The

language variable in the IPUMS data set, furthermore, does not convey differences in the English proficiency of immigrant physicians in the U.S. Rather, it is used to suggest literacy and the ability to communicate effectively in the U.S. It does not pick up the nuances of the language necessary to being a medical practitioner.

In sum, the possession of country-specific skills derived from age at the time of immigration and from source region, gender, age, and the amount of weeks worked all contribute to earnings for physicians. Different immigrants have different levels of U.S. specific skills depending on what age they arrive in the U.S. and what regions they emigrate from. The longer one has been living in the U.S., or, in other words, the more one has invested in human capital domestically and not abroad, the higher his/her earnings will be. Some skills and medical training abroad, for example, may not transfer directly or be completely applicable inside the U.S. As so keenly stated by Friedberg (1996) in reference to immigrants' human capital, "you can't take it with you." Instead, for immigrant physicians to reach earnings parity with natives inside the U.S., the first step may in fact be to invest in their human capital here.

REFERENCES

- Borjas, George J.** *Labor Economics*, 3rd Ed. New York, NY: McGraw-Hill/Irwin, 2005.
- Borjas, George J.** "The Economics of Immigration." *Journal of Economic Literature*, 1994, 32 (4), pp. 1667-1717.
- Chiswick, Barry R.** "The Effect of Americanization on the Earnings of Foreign-Born Men." *The Journal of Political Economy*, 1978, 86 (5), pp. 897-921.

- Cooper, Richard A., and Aiken, Linda H.** "Human Inputs: The Health Care Workforce." *Uncertain Times: Kenneth Arrow and the Changing Economics of Health Care*, Duke University Press, 2003, pp. 71-83.
- Friedberg, Rachel M.** "You Can't Take It With You? Immigrant Assimilation and the Portability of Human Capital." Working Paper, National Bureau of Economic Research, November 1996.
- Khan, Saba Shah, and Featherly, John.** "US Seeks More Foreign Doctors, Medical Students." Federal Information and News Dispatch, Inc., Voice of America News, 2006.
- Medical Group Management Association.** *Physician Compensation and Production Survey*, 2005 Ed. Medical Group Management Association, 2005.
- Mullan, Fitzhugh.** "The Metrics of the Physician Brain Drain." *The New England Journal of Medicine*, 2005, 353 (17) pp. 1810-1818.
- Pasko, Thomas and Smart, Derek R.** *Physician Characteristics and Distribution in the US*, 2005 Ed. The American Medical Association, 2005.
- Seeborg, Michael C., and Sandford, Jeremy.** "The Assimilation of Immigrants Who Arrived in the United States as Children." *The Journal of Business and Economic Research*, 2003, 1(3), pp. 27-36.

Data Sources

Steven Ruggles, Matthew Sobek, Trent Alexander, Catherine A. Fitch, Ronald Goeken, Patricia Kelly Hall, Miriam King, and Chad Ronnander. *Integrated Public Use*

Microdata Series: Version 3.0 [Machine-readable database]. Minneapolis, MN:
Minnesota Population Center [producer and distributor], 2004.