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An Empirical Study of Earnings of Immigrants and Native-Born Americans in the U.S. Labor Market Given Different Levels of Educational Attainment

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State University of New York
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An empirical study of earnings of immigrants and native-born Americans in the U.S.
labor market given different levels of educational attainment

A Thesis in Applied Economics

By
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Abstract

This paper will compare the lifetime wage earnings of immigrants and native born citizens in the US for the years of 2000 – 2010 according to educational attainment using cross-sectional data. The data is obtained through IPUMS-CPS Integrated Public Use of Microdata Series, University of Minnesota. The findings of Investment in Human Capital of Mincer (1958), the Immigrant's Earnings Distribution of Chiswick and Miller (2006), the Pareto's Law of Income Distribution, and the Immigrants Investment in Human Capital Model by Duleep and Regets (1999) are the theoretical basis in which this study will be ruled. The empirical evidence suggests that immigrants who invest in education have closer lifetime income earnings in the higher income distribution levels to the US native born citizens than those who do not. It also shows that according to age, the average wage earnings will increase rapidly the first working years, settle by the middle, and decrease at the end for all the educational attainment levels.

Introduction

It was during the late 50's and 60's when the investment in human capital was finally attributed as one of the major variables explaining the increase in lifetime wage earnings for working force. Various models and statistical analysis has also been of increasing interest in the economy field, since findings points to the statement that a better educated and trained labor force will lead to better earnings and result in economic growth.

Human capital is considered as all the investment that an individual and a company intends for a person's improvement in a specific task, job or occupation. It is accounted by the money spent in tuitions and courses, and by the hours of in-job training that are used for this purpose instead of work.

The US labor supply market is considered one of the best trained and prepared since it is exposed to the newest technology and the most efficient processes in the world. Being a country of opportunities and well paid occupations it is a place of interest for immigrants who search for better earnings and living standards. According to the Bureau of Labor Statistics from the US Department of Labor, in 2015 16.7% of the US labor force is foreign-born people, being Hispanics the 48.8%. ¹

Immigrants will decide to come to the United States for various reasons. The most common are economic motivation, family related issues, political or social persecution (refugees) in home country, and temporary immigration.

¹ *Bureau of Labor Statistics*, Foreign-Born Workers: Labor Force Characteristics — 2015, May 2016, 1, accessed July 12, 2016, <http://www.bls.gov/news.release/pdf/forbrn.pdf>.

The formal education, in-job training and skills for specific tasks could be obtained prior to immigration or post-immigration, and it is a key point for immigration decision making since the costs of investment will be compared with the lifetime wage earnings as a simple return on investment. There is a recent trend vaguely documented of foreign-born workers motivated to invest in education in the destiny country to become more competitive for job seeking. It is also the purpose to close the gap of income inequality of foreign-born vs native-born that is suggested in management and professional occupations.

The return of investment for the two groups are completely different. Attributes such as the costs of education, financial aid available, starting working age, ease of paying tuition, and scholarships are important when analyzing if it is worth it. It is known native-born will have more opportunities of education and training than foreign-born, so it is of this paper interest to analyze if the return on investment is higher.

A better prepared and educated foreign-born labor supply market leads to a more competitive and efficient production country. Immigrants investment in human capital will not only bring social benefits to the country, but it makes part of the equation in both the production and the consumption side.

Government policies of selection of immigrants take into account the possibilities of investment in either physical capital or human capital, and the motivation of future earnings for foreign workers lead to a more prepared foreign-born labor market than the native-born. To put it in simple words, immigrants will invest in education and postpone

wage earnings for the period of schooling duration, with the optimistic expectation of higher income after completion in either country of origin or the U.S. labor market.

Review of Literature

Human Capital

Human capital is a relatively new topic of interest for economists that became widely researched as it is attributed as one of the key factors that could explain economic growth that is not either the mainstream production factors of capital or labor. It is defined as the increase of an individual's productivity levels as a result of all the investment in education, in-job training and skills improvement. It constitutes the additional formation and it does not distinguish between occupations. A perfect example is that of a carpenter and a CEO of a large company. The first employee will invest very little in academic education, but will gain experience as years go by and will stay updated with the latest use of technology and tools with various courses and in-job training. The second employee, the CEO, will invest in usually higher levels of academic education such an MBA or master's degree, and will keep studying through the entirety of his career to keep up with new managerial tools. For now, it will not be of relevance the amount of money or time invested.

Interestingly, it's a personal choice that affects individual's income portraying a typical microeconomic issue, but with a macroeconomic impact in economic development if every single person increases the level of education, and thus the productivity. Under the basic assumption that people make rational decisions, one should evaluate the cost of out-of-pocket investment versus the return of the investment, often calculated with the

lifetime wage earnings. Decision depends also in the availability and ease of funding. More developed countries count with better financial aid programs for educational investment and research programs in various industries. Developing countries, on the other hand, have fewer aids available and lack the funds to invest in research and development in the production level.

The initial major findings in human capital theory are laid on Theodore Schultz and Gary Becker in the early 1960's. Developed countries, like United States, experienced a prolonged continuous economic growth in per capita income in the last decades. And while economic theory holds that growth in either capital or labor will end in diminishing marginal returns, Becker found that it was human capital what was missing in the equation for this sustained economic growth to be possible. He also trotted that developed countries that held this sustained growth also destined large amounts of investment to education and training.²

In 1956, Robert Solow ³, under full employment assumption and no scarce resources, the economic growth will be explained in the investment in one of the two factors of production, labor or capital, holding everything else constant. This model only explains economic growth for periods of time, so it will eventually approach the equilibrium. The production function with decreasing returns to capital is represented by:

$$Y = F(K, L).$$

Where, Y is output, K is capital, and L is labor.

² Gary Becker, *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*, 2nd ed. (New York: National Bureau of Economic Research, 1975), 1.

³ Robert M. Solow, "A Contribution to the Theory of Economic Growth," *The Quarterly Journal of Economics* 70, no. 1 (Feb., 1956): 65-94.

From this starting point, in 1992, Mankiw, Romer and Weil use the analysis of cross-country data to extend the Solow model adding human capital as factor of production.

With the data available, the Solow model implied that effects of savings and population growth on income were too large. In the paper, the authors point out that the exclusion of human capital may explain why they appeared too large, mainly for two reasons.

“First, for any given rate of human capital accumulation, higher savings or lower population growth leads to a higher level of income and thus a higher level of human capital; hence, accumulation of physical capital and population growth have greater impacts on income when accumulation of capital is taken into account. Second, human capital accumulation may be correlated with savings rates and population growth rates; this would imply that omitting human capital accumulation biases the estimated coefficients on savings and population growth.”⁴

The model proposed will then turn out to be a Cobb-Douglas production function, at time t , given by:

$$Y(t) = A(t)^\alpha (K(t)L(t))^{1-\alpha} \quad 0 < \alpha < 1$$

Where: Y is output, K capital, L labor, and A the level of technology. Empirical evidence of the extended model shows consistent results with theory when including human capital.

⁴ Gregory Mankiw, David Romer, and David Weil, “A Contribution to the Empirics of Economic Growth,” *The quarterly journals of economics* 107, no. 2 (May, 1992): 408.

Further development of economic models that takes into account social attributes like family size and fertility has also pointed out the strong relation between population growth rates and human capital.

Theodore Schultz showed in his empirical study that one fifth of the increase of national income in the United States between 1929 and 1957 was explained by additional education of the labor force.⁵

Theory and evidence has shown that investment in education is of benefit for both an individual and to society. The returns on investment for an individual are represented by the future earnings cash flows and to a government by the improvement of society referred to as a better cohesive and well trained labor force.

For simplicity, the profound meaning of education will be omitted, since it has different definitions according to each country. So to make it as universal as possible the significance or the quality of the education received will be disregarded, and only quantitative aspects will be taken into account for human capital calculations.

The value of human capital goes further than just a number, since it is transferable from place to place as a different to investment in physical capital. IF an educated individual decides to immigrate he will take with him all the education and knowledge since it is attached to his own self. But in contrast to land, building, equipment, or any physical capital its timeline depends on human lifespan. Once an individual dies the human capital also does.

⁵ Nelson B. Henry, *Social Forces Influencing American Education* (NYC: National Society for the Study of Education, 1961), 46.

The relevant qualities of human capital investments will be the cost of funding, the time available and the possible lifecycle of the “learned material”. Training and education could be obsolete in a short time or become even more valuable with the years; it all depends in the field and occupation.⁶

Education and Income Distribution

Income and earnings inequality is upon one of the most researched issues among economists for long past years. As Mincer recalled in his paper of “*Investment in Human Capital and Personal Income Distribution*” in 1958 there should be a better close up look to the distribution of incomes and the causes that affects it. Observable parameters should be the starting point to determine the statistical distribution. One of the most known theories is that of which the “individual’s abilities” are normally distributed as in a Gaussian form.⁷ The income distributions of individuals are subject of personal choice, and under the assumption that people are rational the decision to invest will depend on the equalization of present value of lifetime earnings at the time.

The model, in a simple explanation, assumes all individuals have identical abilities and equal chance or opportunity to enter an occupation. Each year of training will reduce earnings by exactly one year. If the flow of income is stable during the extent of the working life it is easier to calculate the difference due to training. The cost of training depends on the length and the costs of educational services such as tuition or

⁶ George Langelett, “Human Capital: A Summary of the 20th Century Research,” *Journal of education finance* 28, no. 1 (Summer 2002): 11.

⁷ Hans Staehle, “Ability, Wages and Income,” *The review of economics and statistics* 25, no. 1 (Feb., 1943): 1.

equipment. If we consider that educational services expenses are zero, we have the following discrete discounting process

$$P_n = P_n \sum_{t=n+1}^T \left(\frac{1}{1+r} \right)^t$$

Where, T is length of working life, P_n are the annual earnings of individuals with n years of training, P_n is the present value of life earnings at the start of training, r is the rate of discount, t l-time, in years.

In the continuous form,

$$P_n = P_n \int_0^T (e^{-rt}) P_n dt = \frac{P_n}{r} (e^{-rT} - e^{-rT})$$

Where, e is the base of natural logarithms, and r is the difference in the amount of training in years.

Then, the present value of lifetime earnings of individuals with $(T - t)$ years of training is

$$P_{T-t} = \frac{P_{T-t}}{r} (e^{-r(T-t)} - e^{-rT})$$

The ratio of annual earnings of people with different years of training t is,

$$P_{T-t}, T - t = \frac{e^{r(T-t)} - 1}{e^{r(T-t)} - 1}$$

From this propositions it is expected that, people with more training will demand higher annual wages; the difference between earnings in people with t years of training depends on the rate of discount of future income; it will depend in the life span.

Another important finding that the author points out in his paper is the role played by age, education, occupation or mixed components. Based on the suggestion that income has a life-path, a statistical study with the income data between the 39th and 49th revealed that age, level of schooling, gender, race determine the peak of income in a lifetime.⁸

Later, in their preliminary report of education and earnings, Becker and Chiswick (1966)⁹ start from the idea that investment in human capital could provide a theory of income distribution that could hold applied to either developed and developing countries. The relation between the investments and the returns on earnings including the original earnings could be expressed as follows:

$$Y_i = Y_0 + \sum_{j=1}^J Y_{ij} Y_{ij}$$

Where Y_{ij} is the amount spent by the i th person on the j th investment, Y_{ij} is the rate of return on this investment, and Y_0 are the effects of the original capital. Their approach takes into account the assumption of rational behavior where as an individual will invest an amount that maximizes his economic welfare.

In a supply and demand for investment in human capital curves will shift and readjust to the equilibrium depending on the cost of funding, the availability of education, the labor market and the demand for occupations, the wealth of family, the interest to consume, scholarships, loans and aid available.

⁸ H. P. Miller, *Income of the American People* (New York: John Wiley & Sons, 1955), 65-68.

⁹ Gary S. Becker and Barry R. Chiswick, "Education and Distribution of Earnings," *The American Economic Review* 56, no. 1 (March 1, 1966): 359-69.

The statistical re-formulation of their theory of earnings is expressed by¹⁰

$$\log y_i \cong a + \bar{r}' x_i + \varepsilon_i$$

Where $a = \log \bar{y}$, \bar{r}' is the average rate of return adjusted for the average fraction of earnings foregone, x_i investment in period i , and ε_i shows the combined effect on earnings of luck and ability. If \bar{r}' and ε_i , the equation could be used to see their contribution to the distribution of earnings, thus the fraction of total inequality in earnings.

The principal characteristic of the theory, is that the author's approach does not work with curve fitting but rather focus on the basic assumption of economic theory that rational behavior leads to maximization. The empirical analysis was done with data available measuring formal education as years of schooling. The results suggest that in different regions of the United States schooling could explain a part of inequality in earnings.

In 1992, Mincer enquires into the empirical validity of Yoram Ben-Porath's model.¹¹

"Yoram's approach brings home the realization that human capital's twin responses to findings in growth accounting and in income distribution statistics are basically the same: aggregate accumulation of human capital is a factor in generating aggregate

¹⁰ See appendix A for mathematical explanation

¹¹ Jacob Mincer, "The Production of Human Capital and the Life Cycle of Earnings: Variations On a Theme," *Journal of labor economics* 15, no. 1 (Jan., 1997): 526-47.

economic growth, while individual accumulation is the process that generates individual economic growth, a basic micro unit in modern labor economics.”¹²

The production function is written by

$$Q_t = Q(H_t, L_t, G_t; \theta)$$

Where Q is a person's gross investment in human capital given a period t , H_t is the stock of human capital at start of t , L_t is the fraction of time in period t used for the production of Q_t , and G_t are purchased goods and services used for the production. The parameter θ is that added by Becker in the production function that refers to the individuals physical and intellectual ability, where Yoram's rationalize decreasing returns to scale.

In its basic formulation in the production model is that investment in human capital produces more human capital and the importance of the use of time in the inputs of production of human capital. “This model offers a productivity based explanation of the growth of earnings with working age.”¹³

Immigrants and Human Capital Investment

Policies of immigration in developed countries are fundamental for the selection of families and workers that will engage in economic activities. Excluding refugees and political asylum cases, immigrants that make the decision to relocate are expected to be more educated or at least rational in their decision making. Migration will happen only if

¹² Jacob Mincer, “The Production of Human Capital and the Life Cycle of Earnings: Variations On a Theme,” *Journal of labor economics* 15, no. 1 (Jan., 1997): 527.

¹³ Jacob Mincer, “The Production of Human Capital and the Life Cycle of Earnings: Variations On a Theme,” *Journal of labor economics* 15, no. 1 (Jan., 1997): 545.

the rate of return when investing in the migration process is greater or equal than the interest of the cost of funding for investment in Human Capital.¹⁴

According to Chiswick (1999) immigrants will ultimately self-select for immigration process. The level of education and the natural ability of the individual play a significant role. Those with more education and ability are expected to make better decisions, which would lead to a better selected supply of qualified immigrants. Since the individual will compare the cost of investment versus the rate of return of future flows in the new place of residency, he will only migrate if it is economically favorable. Out-of-pocket investment will be greater at different levels of education and at different stages of life. The probability of being selected in the labor-market of country of destination is also a key point, given that this is the expected flow of earnings returns to which the investment will be compared.

In the paper "*How Immigrants Fare Across the Earnings Distribution in Australia and the United States*" Chiswick¹⁵, Le, and Miler take a look at the distribution of earnings in Australia and the United States for native-born and for foreign-born, and compare them in the different level of education and ages. Empirical analysis suggested that in lower deciles immigrants from non-English speaking countries earn more than those from English speaking countries and native-born in the U.S. But in the higher deciles foreign-born from English speaking countries have 12% higher mean hourly earnings than native-born, and non-English speaking countries earn 12% below than native-born. In comparison to the U.S. labor market, in Australia immigrants from

¹⁴ Barry R. Chiswick, "Are Immigrants Favorably Self-Selected?," *The American economic review* 89, no. 2 (May, 1999): 181.

¹⁵ Barry R. Chiswick, Anh T. Le, and Paul W. Miller, "How Immigrants Fare Across the Earnings Distribution in Australia and the United States," *Industrial and Labor Relations Review* 61, no. 3 (April, 2008): 353-73.

English speaking countries don't do so well in higher levels of earnings. Differences in labor market and distributions of earnings could be a result of selection immigration policies.

In the study of immigrant investment in human capital, Duleep's and Regets's (1999)¹⁶ empirical and theoretical approach suggest foreign-born invest more than native-born. Considering a two-period model the human capital model for native-born is as follows:

$$\max_{\theta} \{ \theta H_1 (1 - \theta) + \theta [\theta_1 + \theta \theta(\theta_1, \theta)] \}$$

Where θ is the market rate of return of a unit of human capital, H_1 is the initial stock of human capital, θ is the proportion of initial human capital value forgone, and $\theta \theta(\theta_1, \theta)$ is the human capital production function with θ productivity coefficient. Since the human capital may not be completely valued in the destination country, the model introduces a parameter referred to as skills transferability. So the above model for immigrants becomes:

$$\max_{\theta} \{ \theta \theta_1 H_{\theta} (1 - \theta) + \theta [\theta_2 \theta_{\theta} + \theta \theta(\theta_{\theta}, \theta)] \}$$

Where H_{θ} is the immigrant's initial human capital stock in source country and θ is the parameter of skill-transferability, with θ_1 the proportion of source human capital investment valued in the labor market of country of destination and θ_2 the proportion of source-country human capital valued in the second period.

Empirical evidence, suggests that given a level of education measured in schooling years and age, the model of Immigrant Human Capital Investment concludes that:

¹⁶ Duleep, Harriet Orcutt, and Mark C. Regets. "Immigrants and Human Capital Investment." *The American Economic Review* 89, no. 2 (May., 1999): 1.

1. “Immigrants will have faster earnings growth than natives due to both greater human capital investment and greater value over time of source-country skills.
2. Immigrants with low initial skill transferability will have greater human-capital investment, and hence greater earnings growth, than immigrants with high initial skills transferability.
3. More generally, there should be a negative effect of immigrant initial earnings, adjusted for age and source country schooling, on earnings growth.
4. As low-skills transferability immigrants invest more than high-skill-transferability immigrants, earnings differences among immigrants of similar age and education, but separated by source country, will narrow.
5. If initially untransferable human capital is useful in producing new human capital, education will do more, to encourage investment among low-skill-transferability immigrants.”¹⁷

Frank van Tubergen and Herman van de Werfhost, found empirical evidence that shows that post investment in education has a strong relation with pre-emigration education level.¹⁸ Their study was performed with Netherlands population data surveys from 1988, 1991, 1994, 1998, and 2002 for four large immigrant groups: Turkey, Morocco, Suriname, and Dutch Antillean. As the Immigrant Human Capital Investment model suggests, immigrants with higher levels of education are more likely to invest in human capital after immigration process, as it is an outcome of settlement intentions,

¹⁷ Duleep, Harriet Orcutt, and Mark C. Regets. “Immigrants and Human Capital Investment.” *The American Economic Review* 89, no. 2 (May., 1999): 187.

¹⁸ Frank van Tubergen and Herman van de Werfhost, “Post immigration Investment in Education: A Study of Immigrants in the Netherlands,” *Demography* 44, no. 4 (Nov., 2007): 1

skill transferability, and opportunity of costs.

Methodology

The study was conducted as a statistical analysis using time series cross-sectional data tables with samples collected from IPUMS-USA database extract system, University of Minnesota.¹⁹

The specifications of the extract are as follow:

Samples: 11 (2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014)

Variables: 21 (Census year, data set number, household serial number, household weight, group quarter status, person number in sample unit, person weight, sex, age, Hispanic origin, Hispanic origin detailed, birthplace, birthplace detailed, citizenship status, year of immigration, language spoken, language spoken detailed, speaks English, educational attainment, educational attainment detailed, wage and salary income.

After defining the information needed to create the tables, the data was entered in SAS University Edition. The tables were constructed for immigrants, native-born Americans, and both for the years 2004 through 2014. The mean, median and Standard deviation was measured for different level of educational attainment for the ranges of age 0-25, 25-30, 30-40, 40-50, 50-60, 60-70, and 70 and above.

¹⁹ Steven Ruggles, Katie Genadek, Ronald Goeken, Josiah Grover, and Matthew Sobek. Integrated Public Use Microdata Series: Version 6.0 [Machine-readable database]. Minneapolis: University of Minnesota, 2015

The reason the study gazed out the two main groups as total immigrants, and native-born is to draw possible conclusions regarding the differences in the distribution of earnings. Is of important relevance to compare median earnings for both groups and construct a hypothesis based on empirical evidence and theoretical background.

The range of ages is of specific interest as to determine if they have any incidence in the peaks of distribution of earnings in both groups. For immigrants, it is a huge deal when it comes to decision making whether it will be worth human capital investment and emigration process. For native-born it is only from the investment point of view, as decisions are made when older the life-time of earnings returns shortens.

The results are compared to statistics published in various online websites and published papers.

Time series cross-sectional data tables allow to compare results from an extended number of samples collected in a summarized and simple way.

The tables constructed with SAS were then exported to Excel to elaborate the graphs. Linear graphs are the more suitable for comparisons and visual understanding of the information.

Empirical Data

Table 1. Average wage earnings for people with No School Completed, Current Population Survey.

AVERAGE OF INCOME WAGE MEDIAN	No school completed										
	YEAR										
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
UNITED STATES NATIVE-BORN	\$ 10,252.50	\$ 9,617.50	\$ 7,608.13	\$ 9,905.71	\$ 8,586.25	\$ 11,732.00	\$ 13,187.50	\$ 15,134.75	\$ 9,058.63	\$ 12,803.13	\$ 12,328.57
FOREIGN BORN	\$ 12,053.25	\$ 14,275.00	\$ 13,336.00	\$ 14,970.00	\$ 14,830.25	\$ 16,269.13	\$ 16,565.00	\$ 16,357.14	\$ 15,800.00	\$ 13,125.25	\$ 14,685.00
ALL TOGETHER	\$ 11,152.88	\$ 11,946.25	\$ 10,472.06	\$ 12,606.67	\$ 11,708.25	\$ 14,000.56	\$ 14,876.25	\$ 15,705.20	\$ 12,429.31	\$ 12,964.19	\$ 13,585.33

Source: Current Population Survey, Integrated Public Use Microdata Service IPUMS

The average wage earnings for people with no school completed is always higher for foreign born than for U.S. native born. During the year 2008 there was a decrease in the earnings for both groups, which is consistent with the financial crisis that begun in Wall Street and affected the entire country.

Table 2. Average wage earnings for people with High School Diploma, Current Population Survey.

AVERAGE OF INCOME WAGE MEDIAN	High school graduate, or GED										
	YEAR										
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
UNITED STATES NATIVE-BORN	\$ 18,975.00	\$ 19,825.00	\$ 20,562.50	\$ 20,937.50	\$ 21,915.88	\$ 22,183.75	\$ 22,687.50	\$ 23,745.00	\$ 24,171.75	\$ 23,720.00	\$ 23,967.00
FOREIGN BORN	\$ 17,100.00	\$ 18,697.50	\$ 19,057.50	\$ 19,512.50	\$ 21,160.13	\$ 20,540.00	\$ 20,992.63	\$ 22,437.50	\$ 23,176.38	\$ 22,485.00	\$ 22,375.00
ALL TOGETHER	\$ 18,037.50	\$ 19,261.25	\$ 19,810.00	\$ 20,225.00	\$ 21,538.00	\$ 21,361.88	\$ 21,840.06	\$ 23,091.25	\$ 23,674.06	\$ 23,102.50	\$ 23,171.00

Source: Current Population Survey, Integrated Public Use Microdata Service IPUMS

In contrast to no educational at all, when a high school diploma is involved U.S. native-born have higher average wage earnings from years 2000-2010. Earnings are increasing constantly with no low peaks during the financial crisis of 2008.

Table 3. Average wage earnings for people with Bachelor Degree, Current Population Survey.

AVERAGE OF INCOME WAGE MEDIAN	Bachelors degree										
	YEAR										
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
UNITED STATES NATIVE-BORN	\$ 31,613.50	\$ 33,587.50	\$ 34,275.00	\$ 35,625.00	\$ 35,738.63	\$ 36,400.00	\$ 38,550.00	\$ 39,175.00	\$ 41,034.75	\$ 41,750.00	\$ 40,612.50
FOREIGN BORN	\$ 29,799.50	\$ 32,812.50	\$ 31,250.00	\$ 32,500.00	\$ 35,200.00	\$ 33,462.50	\$ 35,710.00	\$ 38,387.50	\$ 39,210.50	\$ 41,300.00	\$ 39,062.50
ALL TOGETHER	\$ 30,706.50	\$ 33,200.00	\$ 32,762.50	\$ 34,062.50	\$ 35,469.31	\$ 34,931.25	\$ 37,130.00	\$ 38,781.25	\$ 40,122.63	\$ 41,525.00	\$ 39,837.50

Source: Current Population Survey, Integrated Public Use Microdata Service IPUMS

For people with a bachelor degree the wage earnings average is higher if for U.S. native-born compared to foreign-born. They also increase consistently for the years from 2000 to 2010 despite the crisis in 2008.

Table 4. Average wage earnings for people with Master Degree, Current Population Survey.

AVERAGE OF INCOME WAGE MEDIAN	Masters degree										
	YEAR										
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
UNITED STATES NATIVE-BORN	\$ 37,750.00	\$ 38,671.63	\$ 40,687.50	\$ 40,400.00	\$ 39,800.00	\$ 42,687.50	\$ 43,612.50	\$ 44,875.13	\$ 45,525.00	\$ 47,875.00	\$ 48,683.25
FOREIGN BORN	\$ 43,600.00	\$ 40,187.50	\$ 44,412.50	\$ 45,000.00	\$ 42,247.88	\$ 43,375.00	\$ 50,777.50	\$ 46,916.38	\$ 58,000.00	\$ 54,100.00	\$ 55,512.50
ALL TOGETHER	\$ 40,675.00	\$ 39,429.56	\$ 42,550.00	\$ 42,700.00	\$ 41,023.94	\$ 43,031.25	\$ 47,195.00	\$ 45,895.75	\$ 51,762.50	\$ 50,987.50	\$ 52,097.88

Source: Current Population Survey, Integrated Public Use Microdata Service IPUMS

Average wage earnings for foreign-born people in the U.S. labor market is higher than native-born.

Table 5. Average wage earnings for people with Doctorate Degree, Current Population Survey.

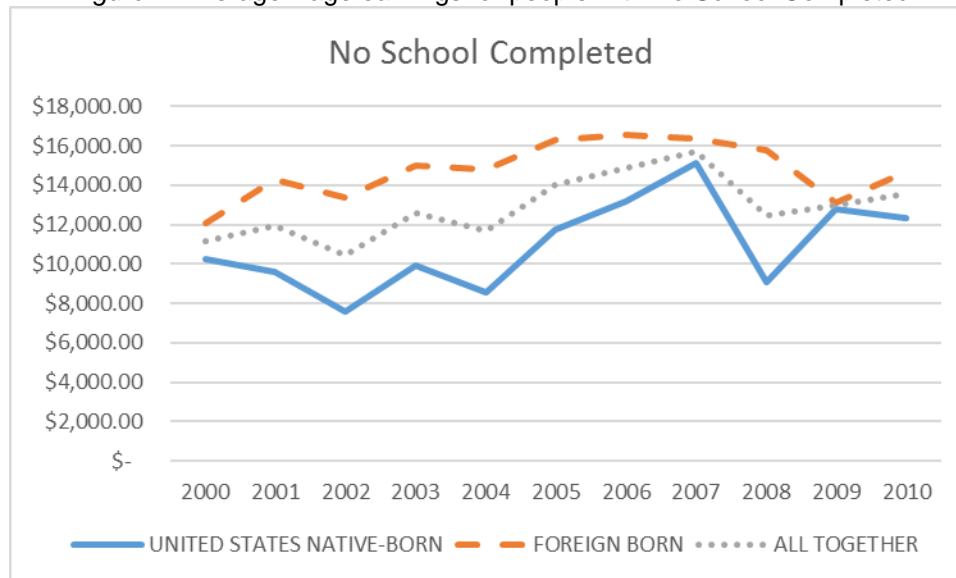
AVERAGE OF INCOME WAGE MEDIAN	Doctorate degree										
	YEAR										
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
UNITED STATES NATIVE-BORN	\$ 53,062.50	\$ 49,844.13	\$ 54,607.14	\$ 76,486.88	\$ 57,937.50	\$ 60,937.50	\$ 53,312.50	\$ 62,432.25	\$ 64,625.00	\$ 69,410.88	\$ 70,432.63
FOREIGN BORN	\$ 48,914.29	\$ 58,250.25	\$ 59,142.86	\$ 62,437.50	\$ 63,714.29	\$ 62,035.50	\$ 61,942.50	\$ 71,857.14	\$ 72,250.25	\$ 83,571.71	\$ 82,457.14
ALL TOGETHER	\$ 51,126.67	\$ 54,047.19	\$ 56,875.00	\$ 69,462.19	\$ 60,633.33	\$ 61,486.50	\$ 57,627.50	\$ 66,830.53	\$ 68,437.63	\$ 76,019.27	\$ 76,044.07

Source: Current Population Survey, Integrated Public Use Microdata Service IPUMS

With the exception of the year 2003, average wage earnings are consistently higher for foreign-born than U.S. native-born.

Graphs

Figure 1. Average wage earnings for people with No School Completed

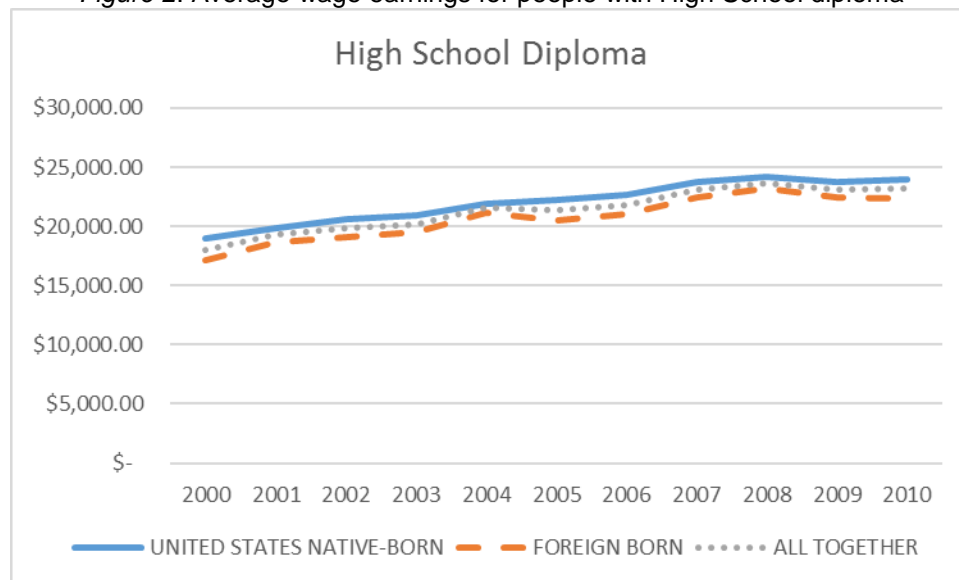


Source: Table 1

As seen in table 1, in Figure 1 it can be appreciated how far below is the average of income earnings for U.S. native-born in contrast to foreign-born. Immigrants who come with no education or school completed to the United States are often under the categories of refugees, asylum seeker and protected witness or special status. Consistent with Chiswick's findings, in the lower deciles and higher deciles of distribution of income, foreign born have higher earnings than native. In this analysis we are not taking into account the distribution itself, but it is expected that for people with no education the average is in the lower tail side of the normal distribution bell graph. During the crisis of 2008 there is a pronounced drought of the earning of native-born, but other than that it is evident the consistent increase through the years. In average,

the foreign born did 39% more than the U.S. native from the years 2000 to 2010. While the labor supply for foreign born appears to be consistent over the years and with similar average wage earnings, for the native born there is more volatility; the lowest in 2002 with \$7,608.13 USD and the highest in 2007 of \$15,134.75, a 99% of difference in only 5 years.

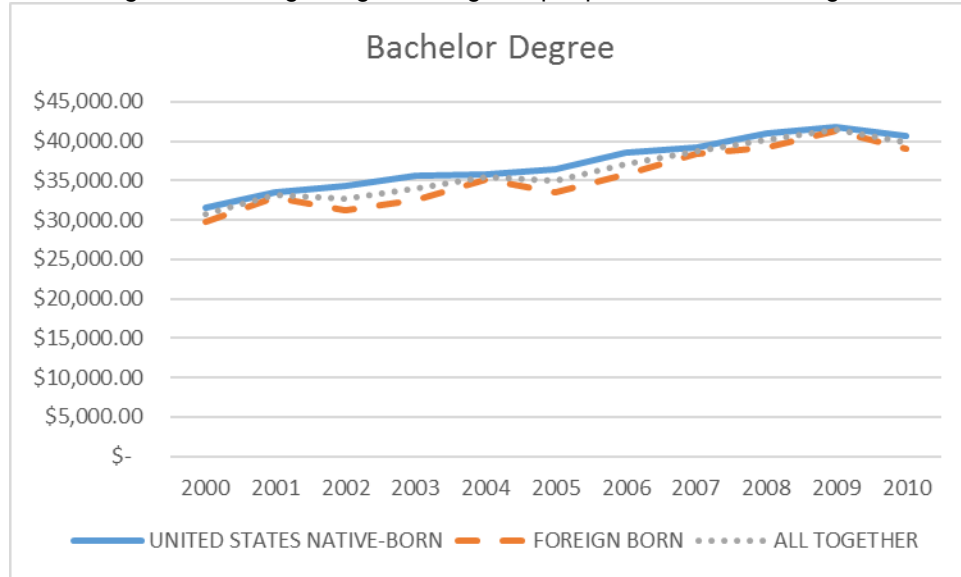
Figure 2. Average wage earnings for people with High School diploma



Source: Table 2

When obtained a high school diploma, U.S. native-born average wage earning is above the foreign born. During the decade of the 2000's, in average, U.S. natives did 6% more than foreign born with this level of education. From the graph we can also conclude that the increase was consistent and positive during the years, and there is no significant peak or drought despite a financial crisis during 2008. The inequality gap between both groups is standard and basically the same for the years observed.

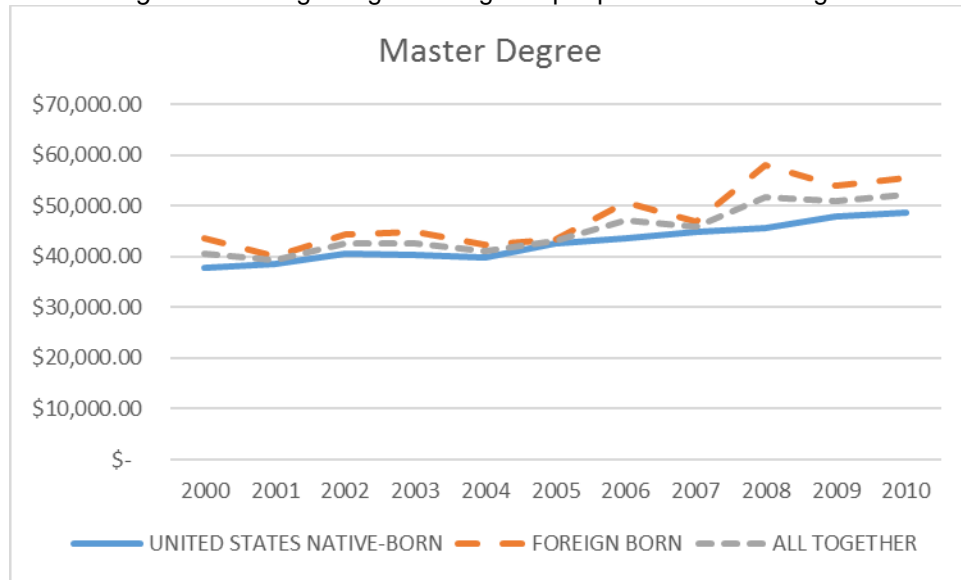
Figure 3. Average wage earnings for people with Bachelor degree



Source: Table 3

With a comparable and valid bachelor's degree, even though native-born average wage earnings are still above the foreign-born, the gap of these two groups is closing. The average of difference is of 5%, and it is slowly getting closer, as for 2009 it is only of 1%. As for 2010 the average income of wage earnings for foreign-born is of \$39,062.50 USD, key point when taking into account future income flows for decision making.

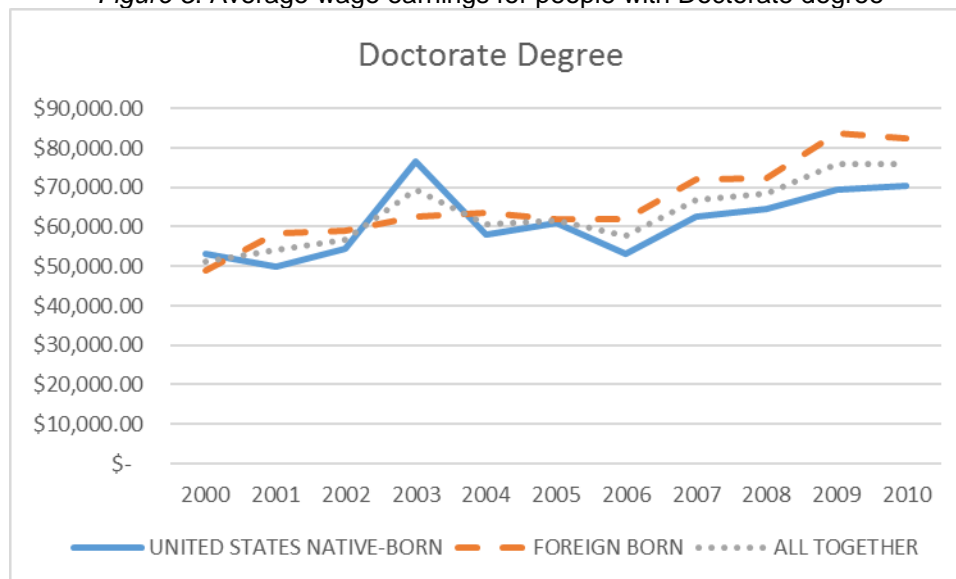
Figure 4. Average wage earnings for people with Master degree



Source: Table 4

Once a master's degree is obtained, the foreign born will again have higher average wage earnings than the native born. Consistent with Chiswick suggestions, then in higher deciles in the income distribution foreign make much better than native born. As pointed out before, we are not taking into account the distribution of earnings, but it is expected that a higher level of education will lead to higher level of income. For example, as in contrast to a high school diploma foreign-born worker that makes in average \$22,375.00 USD in 2010, a person holding a master's degree will make in average \$39,062.50 USD in the same year; a solid 75% more. In the year 2005, evidence show the closest the gap has been in this decade, with a difference of only 2% higher income for foreign-born than native-born. The widest the gap has been, is in the year 2008, where foreign-born made 28% more in average than native-born workers.

Figure 5. Average wage earnings for people with Doctorate degree



Source: Table 5

With a doctorate degree, in average, the foreign-born worker made 8% more than the native-born during the years 2000 to 2010. With exception of the years 2000 and 2003, the earnings for foreign-born is always higher than for U.S. natives; and in 2005 the gap is only of 2%. For 2010, the average wage earning of a foreign-born with doctorate degree is of \$82,457.14 USD, so it is expected that rational individuals that make decisions will invest in more education according to the expectance of future income flows.

AVERAGE OF WAGE EARNINGS US BORN	YEAR										
	2002	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
0 - 25 YEARS	\$ 10,512.80	\$ 10,024.13	\$ 11,315.00	\$ 21,206.67	\$ 9,215.40	\$ 11,411.87	\$ 9,108.67	\$ 10,870.00	\$ 13,005.87	\$ 11,809.53	\$ 11,415.60
Bachelors degree	\$ 17,000.00	\$ 20,000.00	\$ 19,200.00	\$ 20,000.00	\$ 19,500.00	\$ 18,700.00	\$ 20,400.00	\$ 23,000.00	\$ 22,029.00	\$ 23,000.00	\$ 20,400.00
Doctorate degree	\$ 19,000.00	\$ 753.00		\$ 201,360.00	\$ 30,000.00	\$ 49,500.00	\$ 2,000.00	\$ 3,000.00	\$ 28,000.00	\$ 35,087.00	\$ 47,000.00
High school graduate, or GED	\$ 11,000.00	\$ 12,000.00	\$ 12,000.00	\$ 12,000.00	\$ 12,500.00	\$ 13,000.00	\$ 12,500.00	\$ 14,000.00	\$ 14,000.00	\$ 13,000.00	\$ 12,334.00
Masters degree	\$ 24,000.00	\$ 24,000.00	\$ 30,500.00	\$ 16,500.00	\$ 13,000.00	\$ 20,000.00	\$ 25,000.00	\$ 30,000.00	\$ 20,000.00	\$ 30,000.00	\$ 22,000.00
No school completed	\$ 2,600.00	\$ 16,000.00	\$ 910.00	\$ 1,000.00	\$ 2,000.00	\$ 500.00	\$ 12,000.00	\$ 3,650.00	\$ 7,500.00	\$ 2,700.00	\$ 3,500.00
25 - 30 YEARS	\$ 20,437.86	\$ 27,018.20	\$ 23,620.00	\$ 24,514.29	\$ 22,434.67	\$ 26,314.67	\$ 25,069.47	\$ 26,400.13	\$ 28,767.47	\$ 27,172.86	\$ 27,928.57
Bachelors degree	\$ 30,808.00	\$ 32,000.00	\$ 34,000.00	\$ 34,000.00	\$ 31,409.00	\$ 35,000.00	\$ 34,000.00	\$ 35,000.00	\$ 37,000.00	\$ 38,000.00	\$ 36,000.00
Doctorate degree	\$ 38,000.00	\$ 39,000.00	\$ 42,000.00	\$ 41,000.00	\$ 40,000.00	\$ 45,000.00	\$ 32,000.00	\$ 55,000.00	\$ 80,000.00	\$ 52,200.00	\$ 47,000.00
High school graduate, or GED	\$ 20,000.00	\$ 21,000.00	\$ 21,000.00	\$ 22,000.00	\$ 23,000.00	\$ 23,400.00	\$ 23,000.00	\$ 24,000.00	\$ 24,612.00	\$ 24,000.00	\$ 23,400.00
Masters degree	\$ 35,000.00	\$ 36,973.00	\$ 36,000.00	\$ 37,000.00	\$ 36,400.00	\$ 40,000.00	\$ 40,000.00	\$ 40,000.00	\$ 42,700.00	\$ 45,000.00	\$ 46,000.00
No school completed	\$ 780.00	\$ 14,000.00	\$ 7,000.00		\$ 10,000.00	\$ 32,500.00	\$ 10,000.00	\$ 3,800.00	\$ 15,000.00	\$ 17,000.00	
30 - 40 YEARS	\$ 27,960.00	\$ 28,948.53	\$ 29,574.67	\$ 30,378.67	\$ 31,490.93	\$ 31,707.07	\$ 34,909.07	\$ 37,428.13	\$ 35,101.87	\$ 36,166.67	\$ 35,001.80
Bachelors degree	\$ 40,000.00	\$ 40,000.00	\$ 42,000.00	\$ 43,000.00	\$ 43,000.00	\$ 44,000.00	\$ 45,000.00	\$ 47,000.00	\$ 47,000.00	\$ 50,000.00	\$ 48,000.00
Doctorate degree	\$ 56,000.00	\$ 55,000.00	\$ 51,000.00	\$ 60,000.00	\$ 60,000.00	\$ 61,000.00	\$ 62,000.00	\$ 70,000.00	\$ 67,000.00	\$ 75,000.00	\$ 72,000.00
High school graduate, or GED	\$ 24,000.00	\$ 25,000.00	\$ 25,000.00	\$ 25,000.00	\$ 26,000.00	\$ 26,000.00	\$ 27,000.00	\$ 29,000.00	\$ 29,000.00	\$ 28,000.00	\$ 28,000.00
Masters degree	\$ 45,000.00	\$ 45,000.00	\$ 48,000.00	\$ 48,700.00	\$ 48,000.00	\$ 47,500.00	\$ 50,000.00	\$ 50,000.00	\$ 55,000.00	\$ 55,000.00	\$ 56,400.00
No school completed	\$ 15,000.00	\$ 20,000.00	\$ 1,640.00	\$ 17,000.00	\$ 12,000.00	\$ 936.00	\$ 40,000.00	\$ 52,000.00	\$ 25,000.00	\$ 22,000.00	\$ 35,000.00
40 - 50 YEARS	\$ 33,299.87	\$ 31,306.67	\$ 33,833.33	\$ 34,600.00	\$ 37,526.67	\$ 35,598.00	\$ 36,546.67	\$ 39,838.67	\$ 39,233.47	\$ 40,234.53	\$ 40,014.40
Bachelors degree	\$ 43,000.00	\$ 45,700.00	\$ 47,000.00	\$ 48,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 52,000.00	\$ 55,000.00	\$ 55,000.00	\$ 55,000.00
Doctorate degree	\$ 63,000.00	\$ 65,000.00	\$ 64,000.00	\$ 73,000.00	\$ 83,000.00	\$ 70,000.00	\$ 76,000.00	\$ 80,000.00	\$ 81,000.00	\$ 85,000.00	\$ 89,000.00
High school graduate, or GED	\$ 25,000.00	\$ 26,500.00	\$ 27,500.00	\$ 27,000.00	\$ 29,000.00	\$ 29,120.00	\$ 30,000.00	\$ 30,000.00	\$ 31,000.00	\$ 30,760.00	\$ 31,000.00
Masters degree	\$ 50,000.00	\$ 51,000.00	\$ 53,000.00	\$ 55,000.00	\$ 55,000.00	\$ 60,000.00	\$ 60,000.00	\$ 62,000.00	\$ 61,500.00	\$ 68,000.00	\$ 65,066.00
No school completed	\$ 20,000.00	\$ 1,300.00	\$ 21,000.00	\$ 12,000.00	\$ 3,100.00	\$ 850.00	\$ 2,500.00	\$ 30,680.00	\$ 15,000.00	\$ 23,000.00	\$ 11,000.00
50 - 60 YEARS	\$ 32,792.00	\$ 34,159.20	\$ 35,000.73	\$ 35,326.33	\$ 36,020.27	\$ 38,475.73	\$ 37,154.93	\$ 38,553.07	\$ 37,906.40	\$ 40,180.00	\$ 38,710.73
Bachelors degree	\$ 45,000.00	\$ 45,000.00	\$ 45,000.00	\$ 46,000.00	\$ 48,000.00	\$ 50,000.00	\$ 50,000.00	\$ 52,000.00	\$ 53,249.00	\$ 55,000.00	\$ 55,000.00
Doctorate degree	\$ 70,000.00	\$ 66,000.00	\$ 71,000.00	\$ 77,000.00	\$ 80,000.00	\$ 76,000.00	\$ 80,000.00	\$ 95,000.00	\$ 78,000.00	\$ 96,000.00	\$ 87,061.00
High school graduate, or GED	\$ 25,000.00	\$ 26,000.00	\$ 27,000.00	\$ 27,000.00	\$ 29,000.00	\$ 29,000.00	\$ 30,000.00	\$ 30,000.00	\$ 31,512.00	\$ 31,000.00	\$ 31,000.00
Masters degree	\$ 51,000.00	\$ 50,000.00	\$ 53,000.00	\$ 54,000.00	\$ 56,000.00	\$ 58,000.00	\$ 59,000.00	\$ 60,000.00	\$ 60,000.00	\$ 63,000.00	\$ 64,000.00
No school completed	\$ 5,000.00	\$ 10,600.00	\$ 15,000.00	\$ 8,640.00	\$ 10,920.00	\$ 23,000.00	\$ 10,000.00	\$ 1,796.00	\$ 1,163.00	\$ 10,000.00	\$ 6,000.00
60 - 70 YEARS	\$ 28,879.20	\$ 25,526.27	\$ 27,613.33	\$ 29,546.93	\$ 30,122.27	\$ 29,413.33	\$ 31,549.07	\$ 33,411.33	\$ 35,919.93	\$ 36,113.33	\$ 35,943.27
Bachelors degree	\$ 30,000.00	\$ 35,000.00	\$ 32,000.00	\$ 38,000.00	\$ 38,000.00	\$ 39,000.00	\$ 42,000.00	\$ 43,000.00	\$ 49,000.00	\$ 47,000.00	\$ 42,000.00
Doctorate degree	\$ 65,000.00	\$ 70,000.00	\$ 70,000.00	\$ 75,000.00	\$ 70,000.00	\$ 72,000.00	\$ 68,000.00	\$ 80,458.00	\$ 83,000.00	\$ 82,000.00	\$ 81,400.00
High school graduate, or GED	\$ 17,000.00	\$ 18,000.00	\$ 19,000.00	\$ 20,500.00	\$ 22,640.00	\$ 22,950.00	\$ 23,000.00	\$ 24,960.00	\$ 25,000.00	\$ 25,000.00	\$ 25,002.00
Masters degree	\$ 42,000.00	\$ 42,400.00	\$ 43,000.00	\$ 42,000.00	\$ 43,800.00	\$ 45,000.00	\$ 45,000.00	\$ 50,000.00	\$ 50,000.00	\$ 54,000.00	\$ 55,000.00
No school completed	\$ 28,000.00	\$ 1,040.00	\$ 9,600.00	\$ 7,000.00	\$ 750.00	\$ 450.00	\$ 9,000.00	\$ 1,152.00	\$ 799.00	\$ 12,500.00	\$ 15,000.00
70 YEARS AND ABOVE	\$ 13,212.00	\$ 12,098.93	\$ 11,122.40	\$ 15,039.00	\$ 16,891.13	\$ 17,496.60	\$ 18,648.00	\$ 19,132.27	\$ 17,417.93	\$ 18,675.47	\$ 18,401.60
Bachelors degree	\$ 11,000.00	\$ 12,000.00	\$ 15,000.00	\$ 16,000.00	\$ 16,000.00	\$ 13,500.00	\$ 25,000.00	\$ 16,400.00	\$ 20,000.00	\$ 20,000.00	\$ 23,500.00
Doctorate degree	\$ 53,000.00	\$ 40,000.00	\$ 19,250.00	\$ 14,035.00	\$ 28,000.00	\$ 44,000.00	\$ 36,500.00	\$ 36,000.00	\$ 25,000.00	\$ 50,000.00	\$ 60,000.00
High school graduate, or GED	\$ 9,000.00	\$ 8,100.00	\$ 10,000.00	\$ 11,000.00	\$ 9,187.00	\$ 10,000.00	\$ 11,000.00	\$ 13,000.00	\$ 12,250.00	\$ 12,000.00	\$ 15,000.00
Masters degree	\$ 8,000.00	\$ 12,000.00	\$ 12,000.00	\$ 20,000.00	\$ 16,200.00	\$ 20,000.00	\$ 18,400.00	\$ 13,001.00	\$ 20,000.00	\$ 10,000.00	\$ 21,000.00
No school completed	\$ 3,640.00	\$ 3,600.00	\$ 960.00	\$ 11,700.00	\$ 19,000.00	\$ 29,120.00	\$ 12,000.00	\$ 19,000.00	\$ 7.00	\$ 2,725.00	\$ 4,800.00
Grand Total	\$ 23,981.92	\$ 24,408.58	\$ 24,992.00	\$ 27,311.04	\$ 26,552.42	\$ 27,406.70	\$ 27,811.98	\$ 29,572.53	\$ 29,739.91	\$ 30,282.46	\$ 29,937.04

Table 6. Average wage earnings for US born, by age and educational attainment 2000-2010, Current Population Survey.

AVERAGE OF WAGE EARNINGS FOREIGN	YEAR										
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
0-25 YEARS	\$ 12,370.00	\$ 13,840.00	\$ 13,305.71	\$ 13,529.14	\$ 12,354.00	\$ 17,125.86	\$ 14,514.00	\$ 13,207.14	\$ 18,072.27	\$ 15,571.57	\$ 15,190.86
Bachelors degree	\$ 14,330.00	\$ 16,000.00	\$ 15,000.00	\$ 20,000.00	\$ 20,000.00	\$ 15,000.00	\$ 24,980.00	\$ 17,000.00	\$ 20,184.00	\$ 23,000.00	\$ 17,500.00
Doctorate degree		\$ 29,000.00		\$ 4,500.00		\$ 77,282.00	\$ 7,540.00		\$ 47,000.00		
High school graduate, or GED	\$ 12,000.00	\$ 12,600.00	\$ 14,400.00	\$ 14,000.00	\$ 13,000.00	\$ 13,000.00	\$ 14,150.00	\$ 15,000.00	\$ 16,000.00	\$ 15,000.00	\$ 14,000.00
Masters degree	\$ 50,000.00	\$ 20,000.00	\$ 24,000.00	\$ 40,000.00	\$ 9,600.00	\$ 24,000.00	\$ 45,000.00	\$ 17,000.00	\$ 27,000.00	\$ 15,000.00	\$ 27,900.00
No school completed	\$ 9,200.00	\$ 14,000.00	\$ 15,000.00	\$ 11,000.00	\$ 15,600.00	\$ 10,000.00	\$ 14,560.00	\$ 15,000.00	\$ 18,000.00	\$ 14,000.00	\$ 18,000.00
25 - 30 YEARS	\$ 21,849.73	\$ 22,785.33	\$ 24,093.20	\$ 26,345.33	\$ 24,728.00	\$ 23,136.27	\$ 23,811.33	\$ 26,044.00	\$ 25,717.73	\$ 25,062.67	\$ 27,026.67
Bachelors degree	\$ 30,066.00	\$ 32,500.00	\$ 33,000.00	\$ 30,000.00	\$ 32,000.00	\$ 30,000.00	\$ 36,000.00	\$ 38,000.00	\$ 35,000.00	\$ 35,000.00	\$ 37,000.00
Doctorate degree	\$ 35,000.00	\$ 45,000.00	\$ 50,000.00	\$ 85,000.00	\$ 40,000.00	\$ 36,002.00	\$ 26,000.00	\$ 55,000.00	\$ 32,000.00	\$ 40,000.00	\$ 79,000.00
High school graduate, or GED	\$ 16,000.00	\$ 19,000.00	\$ 19,760.00	\$ 20,000.00	\$ 19,000.00	\$ 19,240.00	\$ 19,200.00	\$ 20,000.00	\$ 21,424.00	\$ 20,000.00	\$ 20,000.00
Masters degree	\$ 46,500.00	\$ 40,000.00	\$ 48,000.00	\$ 40,000.00	\$ 30,000.00	\$ 34,000.00	\$ 38,000.00	\$ 30,000.00	\$ 48,500.00	\$ 50,000.00	\$ 50,000.00
No school completed	\$ 7,800.00	\$ 13,000.00	\$ 14,688.00	\$ 16,000.00	\$ 14,400.00	\$ 20,000.00	\$ 15,000.00	\$ 21,000.00	\$ 17,000.00	\$ 10,000.00	\$ 10,400.00
30 - 40 YEARS	\$ 24,954.67	\$ 27,520.00	\$ 28,612.00	\$ 29,160.00	\$ 29,027.07	\$ 30,594.73	\$ 30,970.93	\$ 33,033.33	\$ 31,980.13	\$ 33,039.53	\$ 31,508.67
Bachelors degree	\$ 35,000.00	\$ 37,000.00	\$ 40,000.00	\$ 37,000.00	\$ 42,000.00	\$ 40,000.00	\$ 41,100.00	\$ 45,000.00	\$ 49,000.00	\$ 48,400.00	\$ 45,000.00
Doctorate degree	\$ 50,600.00	\$ 60,000.00	\$ 53,000.00	\$ 70,000.00	\$ 61,000.00	\$ 60,000.00	\$ 60,000.00	\$ 74,000.00	\$ 65,002.00	\$ 73,000.00	\$ 60,000.00
High school graduate, or GED	\$ 18,000.00	\$ 20,000.00	\$ 20,500.00	\$ 21,000.00	\$ 20,581.00	\$ 22,000.00	\$ 24,000.00	\$ 24,000.00	\$ 25,000.00	\$ 24,000.00	\$ 22,000.00
Masters degree	\$ 50,000.00	\$ 50,000.00	\$ 55,000.00	\$ 50,000.00	\$ 53,383.00	\$ 55,000.00	\$ 55,000.00	\$ 60,000.00	\$ 64,500.00	\$ 68,000.00	\$ 70,000.00
No school completed	\$ 14,000.00	\$ 16,640.00	\$ 13,000.00	\$ 16,900.00	\$ 16,042.00	\$ 17,169.00	\$ 15,000.00	\$ 17,500.00	\$ 18,000.00	\$ 11,000.00	\$ 15,000.00
40 - 50 YEARS	\$ 27,025.07	\$ 30,126.67	\$ 31,970.67	\$ 33,506.67	\$ 32,058.67	\$ 34,713.33	\$ 38,176.73	\$ 37,757.13	\$ 37,480.13	\$ 38,381.47	\$ 37,690.67
Bachelors degree	\$ 36,000.00	\$ 40,000.00	\$ 40,000.00	\$ 40,000.00	\$ 40,000.00	\$ 40,500.00	\$ 44,000.00	\$ 44,000.00	\$ 45,500.00	\$ 50,000.00	\$ 46,000.00
Doctorate degree	\$ 53,000.00	\$ 70,000.00	\$ 75,000.00	\$ 75,000.00	\$ 70,000.00	\$ 80,000.00	\$ 100,000.00	\$ 92,000.00	\$ 74,000.00	\$ 95,002.00	\$ 90,000.00
High school graduate, or GED	\$ 21,000.00	\$ 21,000.00	\$ 20,800.00	\$ 23,000.00	\$ 24,000.00	\$ 24,000.00	\$ 24,591.00	\$ 25,000.00	\$ 26,002.00	\$ 25,000.00	\$ 25,000.00
Masters degree	\$ 50,000.00	\$ 51,500.00	\$ 60,000.00	\$ 50,000.00	\$ 55,000.00	\$ 60,000.00	\$ 67,000.00	\$ 70,000.00	\$ 72,000.00	\$ 70,000.00	\$ 69,000.00
No school completed	\$ 14,976.00	\$ 15,000.00	\$ 15,000.00	\$ 16,000.00	\$ 13,000.00	\$ 20,000.00	\$ 17,760.00	\$ 17,000.00	\$ 19,000.00	\$ 13,000.00	\$ 17,680.00
50 - 60 YEARS	\$ 28,099.33	\$ 30,595.27	\$ 33,973.33	\$ 32,966.67	\$ 32,647.20	\$ 32,992.00	\$ 35,431.60	\$ 37,906.67	\$ 36,691.47	\$ 35,356.73	\$ 38,681.40
Bachelors degree	\$ 40,000.00	\$ 35,000.00	\$ 40,000.00	\$ 41,000.00	\$ 42,600.00	\$ 44,000.00	\$ 41,600.00	\$ 47,600.00	\$ 50,000.00	\$ 45,000.00	\$ 45,000.00
Doctorate degree	\$ 65,000.00	\$ 65,002.00	\$ 84,000.00	\$ 70,000.00	\$ 70,000.00	\$ 80,000.00	\$ 80,000.00	\$ 95,000.00	\$ 75,000.00	\$ 86,000.00	\$ 100,000.00
High school graduate, or GED	\$ 20,000.00	\$ 23,400.00	\$ 24,000.00	\$ 23,000.00	\$ 25,000.00	\$ 26,000.00	\$ 26,000.00	\$ 27,000.00	\$ 26,000.00	\$ 25,000.00	\$ 25,000.00
Masters degree	\$ 48,000.00	\$ 56,000.00	\$ 60,000.00	\$ 50,000.00	\$ 58,000.00	\$ 60,000.00	\$ 69,000.00	\$ 70,000.00	\$ 70,000.00	\$ 60,000.00	\$ 63,000.00
No school completed	\$ 13,500.00	\$ 13,000.00	\$ 15,000.00	\$ 14,300.00	\$ 15,600.00	\$ 15,600.00	\$ 18,200.00	\$ 15,000.00	\$ 13,000.00	\$ 18,000.00	\$ 19,000.00
60 - 70 YEARS	\$ 27,262.67	\$ 28,852.00	\$ 29,869.27	\$ 28,540.80	\$ 27,645.33	\$ 33,148.53	\$ 36,900.00	\$ 34,145.73	\$ 35,999.13	\$ 38,320.13	\$ 38,452.27
Bachelors degree	\$ 39,000.00	\$ 35,000.00	\$ 30,000.00	\$ 32,000.00	\$ 35,000.00	\$ 31,200.00	\$ 38,000.00	\$ 41,500.00	\$ 40,000.00	\$ 40,000.00	\$ 40,000.00
Doctorate degree	\$ 70,000.00	\$ 75,000.00	\$ 72,000.00	\$ 50,000.00	\$ 75,000.00	\$ 80,000.00	\$ 100,000.00	\$ 100,000.00	\$ 100,000.00	\$ 70,000.00	\$ 110,000.00
High school graduate, or GED	\$ 21,000.00	\$ 17,640.00	\$ 18,000.00	\$ 20,100.00	\$ 22,000.00	\$ 22,000.00	\$ 22,000.00	\$ 26,000.00	\$ 25,985.00	\$ 24,000.00	\$ 25,000.00
Masters degree	\$ 44,000.00	\$ 40,000.00	\$ 41,600.00	\$ 60,000.00	\$ 52,000.00	\$ 50,000.00	\$ 60,000.00	\$ 62,331.00	\$ 52,000.00	\$ 55,000.00	\$ 62,200.00
No school completed	\$ 14,950.00	\$ 11,000.00	\$ 14,000.00	\$ 18,000.00	\$ 11,000.00	\$ 19,400.00	\$ 13,000.00	\$ 12,000.00	\$ 20,000.00	\$ 15,002.00	\$ 10,400.00
70 YEARS AND ABOVE	\$ 16,263.23	\$ 20,009.20	\$ 17,115.67	\$ 28,271.60	\$ 20,244.93	\$ 18,608.07	\$ 21,569.53	\$ 20,053.50	\$ 32,248.07	\$ 35,807.29	\$ 24,852.00
Bachelors degree	\$ 9,000.00	\$ 32,000.00	\$ 16,000.00	\$ 24,000.00	\$ 31,000.00	\$ 30,000.00	\$ 20,000.00	\$ 32,000.00	\$ 30,000.00	\$ 44,000.00	\$ 40,000.00
Doctorate degree	\$ 10,800.00	\$ 60,000.00	\$ 10,000.00	\$ 75,000.00	\$ 65,000.00	\$ 13,000.00	\$ 50,000.00	\$ 10,000.00	\$ 110,000.00	\$ 135,000.00	\$ 55,000.00
High school graduate, or GED	\$ 10,800.00	\$ 16,848.00	\$ 15,000.00	\$ 15,000.00	\$ 25,700.00	\$ 17,280.00	\$ 17,000.00	\$ 20,000.00	\$ 21,000.00	\$ 24,000.00	\$ 25,000.00
Masters degree	\$ 10,300.00	\$ 14,000.00	\$ 11,700.00	\$ 20,000.00	\$ 30,000.00	\$ 11,000.00	\$ 12,220.00	\$ 6,000.00	\$ 65,000.00	\$ 54,800.00	\$ 36,000.00
No school completed	\$ 9,000.00	\$ 17,000.00	\$ 5,000.00	\$ 13,000.00	\$ 18,000.00	\$ 9,984.00	\$ 23,000.00		\$ 5,400.00	\$ 10,000.00	\$ 12,000.00
Grand Total	\$ 23,166.76	\$ 25,036.91	\$ 26,095.91	\$ 27,691.46	\$ 26,158.57	\$ 27,576.08	\$ 29,135.07	\$ 29,530.03	\$ 31,393.13	\$ 31,959.55	\$ 31,106.50

Table 7. Average wage earnings for Foreign born, by age and educational attainment 2000-2010, Current Population Survey.

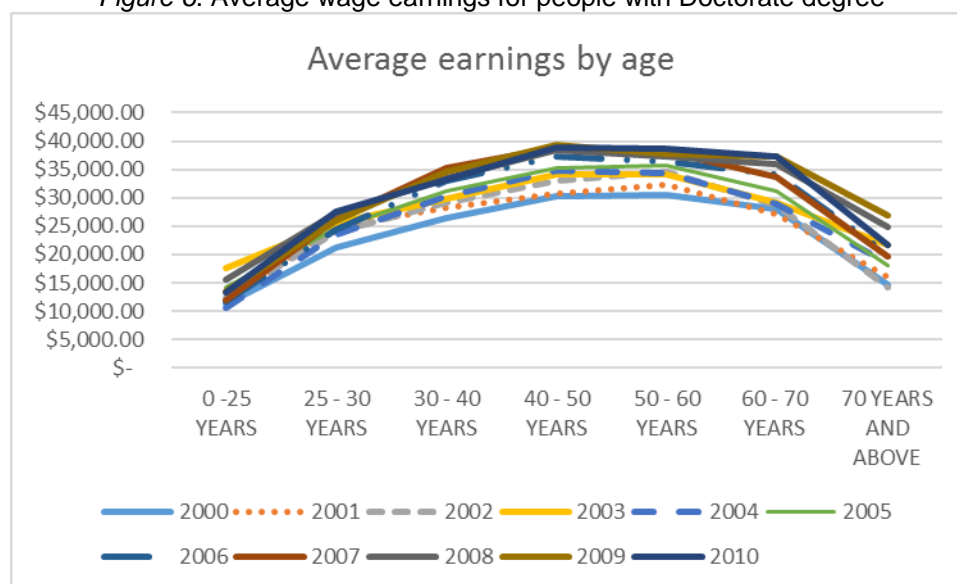
AVERAGE OF WAGE EARNINGS ALL	YEAR										
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
0 - 25 YEARS	\$ 11,375.07	\$ 11,932.07	\$ 12,310.36	\$ 17,500.28	\$ 10,672.61	\$ 14,170.34	\$ 11,811.33	\$ 11,998.28	\$ 15,539.07	\$ 13,625.69	\$ 13,238.14
Bachelors degree	\$ 15,665.00	\$ 18,000.00	\$ 17,100.00	\$ 20,000.00	\$ 19,750.00	\$ 16,850.00	\$ 22,690.00	\$ 20,000.00	\$ 21,106.50	\$ 23,000.00	\$ 18,950.00
Doctorate degree	\$ 19,000.00	\$ 14,876.50		\$ 102,930.00	\$ 30,000.00	\$ 63,391.00	\$ 4,770.00	\$ 3,000.00	\$ 37,500.00	\$ 35,087.00	\$ 47,000.00
High school graduate, or GED	\$ 11,500.00	\$ 12,300.00	\$ 13,200.00	\$ 13,000.00	\$ 12,750.00	\$ 13,000.00	\$ 13,325.00	\$ 14,500.00	\$ 15,000.00	\$ 14,000.00	\$ 13,167.00
Masters degree	\$ 37,000.00	\$ 22,000.00	\$ 27,250.00	\$ 28,250.00	\$ 11,300.00	\$ 22,000.00	\$ 35,000.00	\$ 23,500.00	\$ 23,500.00	\$ 22,500.00	\$ 24,950.00
No school completed	\$ 5,900.00	\$ 15,000.00	\$ 7,955.00	\$ 6,000.00	\$ 8,800.00	\$ 5,250.00	\$ 13,280.00	\$ 9,325.00	\$ 12,750.00	\$ 8,350.00	\$ 10,750.00
25 - 30 YEARS	\$ 21,168.14	\$ 24,901.77	\$ 23,856.60	\$ 25,461.38	\$ 23,581.33	\$ 24,725.47	\$ 24,440.40	\$ 26,222.07	\$ 27,242.60	\$ 26,081.38	\$ 27,462.07
Bachelors degree	\$ 30,437.00	\$ 32,250.00	\$ 33,500.00	\$ 32,000.00	\$ 31,704.50	\$ 32,500.00	\$ 35,000.00	\$ 36,500.00	\$ 36,000.00	\$ 36,500.00	\$ 36,500.00
Doctorate degree	\$ 36,500.00	\$ 42,000.00	\$ 46,000.00	\$ 63,000.00	\$ 40,000.00	\$ 40,501.00	\$ 29,000.00	\$ 55,000.00	\$ 56,000.00	\$ 46,100.00	\$ 63,000.00
High school graduate, or GED	\$ 18,000.00	\$ 20,000.00	\$ 20,380.00	\$ 21,000.00	\$ 21,000.00	\$ 21,320.00	\$ 21,100.00	\$ 22,000.00	\$ 23,018.00	\$ 22,000.00	\$ 21,700.00
Masters degree	\$ 40,750.00	\$ 38,486.50	\$ 42,000.00	\$ 38,500.00	\$ 33,200.00	\$ 37,000.00	\$ 39,000.00	\$ 35,000.00	\$ 45,600.00	\$ 47,500.00	\$ 48,000.00
No school completed	\$ 4,290.00	\$ 13,500.00	\$ 10,844.00	\$ 16,000.00	\$ 12,200.00	\$ 26,250.00	\$ 12,500.00	\$ 12,400.00	\$ 16,000.00	\$ 13,500.00	\$ 10,400.00
30 - 40 YEARS	\$ 26,457.33	\$ 28,234.27	\$ 29,093.33	\$ 29,769.33	\$ 30,259.00	\$ 31,150.90	\$ 32,940.00	\$ 35,230.73	\$ 33,541.00	\$ 34,603.10	\$ 33,255.23
Bachelors degree	\$ 37,500.00	\$ 38,500.00	\$ 41,000.00	\$ 40,000.00	\$ 42,500.00	\$ 42,000.00	\$ 43,050.00	\$ 46,000.00	\$ 48,000.00	\$ 49,200.00	\$ 46,500.00
Doctorate degree	\$ 53,300.00	\$ 57,500.00	\$ 52,000.00	\$ 65,000.00	\$ 60,500.00	\$ 60,500.00	\$ 61,000.00	\$ 72,000.00	\$ 66,001.00	\$ 74,000.00	\$ 66,000.00
High school graduate, or GED	\$ 21,000.00	\$ 22,500.00	\$ 22,750.00	\$ 23,000.00	\$ 23,290.50	\$ 24,000.00	\$ 25,500.00	\$ 26,500.00	\$ 27,000.00	\$ 26,000.00	\$ 25,000.00
Masters degree	\$ 47,500.00	\$ 47,500.00	\$ 51,500.00	\$ 49,350.00	\$ 50,691.50	\$ 51,250.00	\$ 52,500.00	\$ 55,000.00	\$ 59,750.00	\$ 61,500.00	\$ 63,200.00
No school completed	\$ 14,500.00	\$ 18,320.00	\$ 7,320.00	\$ 16,950.00	\$ 14,021.00	\$ 9,052.50	\$ 27,500.00	\$ 34,750.00	\$ 21,500.00	\$ 16,500.00	\$ 25,000.00
40 - 50 YEARS	\$ 30,162.47	\$ 30,716.67	\$ 32,902.00	\$ 34,053.33	\$ 34,792.67	\$ 35,155.67	\$ 37,361.70	\$ 38,797.90	\$ 38,356.80	\$ 39,308.00	\$ 38,852.53
Bachelors degree	\$ 39,500.00	\$ 42,850.00	\$ 43,500.00	\$ 44,000.00	\$ 45,000.00	\$ 45,250.00	\$ 47,000.00	\$ 48,000.00	\$ 50,250.00	\$ 52,500.00	\$ 50,500.00
Doctorate degree	\$ 58,000.00	\$ 67,500.00	\$ 69,500.00	\$ 74,000.00	\$ 76,500.00	\$ 75,000.00	\$ 88,000.00	\$ 86,000.00	\$ 77,500.00	\$ 90,001.00	\$ 89,500.00
High school graduate, or GED	\$ 23,000.00	\$ 23,750.00	\$ 24,150.00	\$ 25,000.00	\$ 26,500.00	\$ 26,560.00	\$ 27,295.50	\$ 27,500.00	\$ 28,501.00	\$ 27,880.00	\$ 28,000.00
Masters degree	\$ 50,000.00	\$ 51,250.00	\$ 56,500.00	\$ 52,500.00	\$ 55,000.00	\$ 60,000.00	\$ 63,500.00	\$ 66,000.00	\$ 66,750.00	\$ 69,000.00	\$ 67,033.00
No school completed	\$ 17,488.00	\$ 8,150.00	\$ 18,000.00	\$ 14,000.00	\$ 8,050.00	\$ 10,425.00	\$ 10,130.00	\$ 23,840.00	\$ 17,000.00	\$ 18,000.00	\$ 14,340.00
50 - 60 YEARS	\$ 30,445.67	\$ 32,377.23	\$ 34,487.03	\$ 34,146.50	\$ 34,333.73	\$ 35,733.87	\$ 36,293.27	\$ 38,229.87	\$ 37,298.93	\$ 37,768.37	\$ 38,696.07
Bachelors degree	\$ 42,500.00	\$ 40,000.00	\$ 42,500.00	\$ 43,500.00	\$ 45,300.00	\$ 47,000.00	\$ 45,800.00	\$ 49,800.00	\$ 51,624.50	\$ 50,000.00	\$ 50,000.00
Doctorate degree	\$ 67,500.00	\$ 65,501.00	\$ 77,500.00	\$ 73,500.00	\$ 75,000.00	\$ 78,000.00	\$ 80,000.00	\$ 95,000.00	\$ 76,500.00	\$ 91,000.00	\$ 93,530.50
High school graduate, or GED	\$ 22,500.00	\$ 24,700.00	\$ 25,500.00	\$ 25,000.00	\$ 27,000.00	\$ 27,500.00	\$ 28,000.00	\$ 28,500.00	\$ 28,756.00	\$ 28,000.00	\$ 28,000.00
Masters degree	\$ 49,500.00	\$ 53,000.00	\$ 56,500.00	\$ 52,000.00	\$ 57,000.00	\$ 59,000.00	\$ 64,000.00	\$ 65,000.00	\$ 65,000.00	\$ 61,500.00	\$ 63,500.00
No school completed	\$ 9,250.00	\$ 11,800.00	\$ 15,000.00	\$ 11,470.00	\$ 13,260.00	\$ 19,300.00	\$ 14,100.00	\$ 8,398.00	\$ 7,081.50	\$ 14,000.00	\$ 12,500.00
60 - 70 YEARS	\$ 28,070.93	\$ 27,189.13	\$ 28,741.30	\$ 29,043.87	\$ 28,883.80	\$ 31,280.93	\$ 34,224.53	\$ 33,778.53	\$ 35,959.53	\$ 37,216.73	\$ 37,197.77
Bachelors degree	\$ 34,500.00	\$ 35,000.00	\$ 31,000.00	\$ 35,000.00	\$ 36,500.00	\$ 35,100.00	\$ 40,000.00	\$ 42,250.00	\$ 44,500.00	\$ 43,500.00	\$ 41,000.00
Doctorate degree	\$ 67,500.00	\$ 72,500.00	\$ 71,000.00	\$ 62,500.00	\$ 72,500.00	\$ 76,000.00	\$ 84,000.00	\$ 90,229.00	\$ 91,500.00	\$ 76,000.00	\$ 95,700.00
High school graduate, or GED	\$ 19,000.00	\$ 17,820.00	\$ 18,500.00	\$ 20,300.00	\$ 22,320.00	\$ 22,475.00	\$ 22,500.00	\$ 25,480.00	\$ 25,492.50	\$ 24,500.00	\$ 25,001.00
Masters degree	\$ 43,000.00	\$ 41,200.00	\$ 42,300.00	\$ 51,000.00	\$ 47,900.00	\$ 47,500.00	\$ 52,500.00	\$ 56,165.50	\$ 51,000.00	\$ 54,500.00	\$ 58,600.00
No school completed	\$ 21,475.00	\$ 6,020.00	\$ 11,800.00	\$ 12,500.00	\$ 5,875.00	\$ 9,925.00	\$ 11,000.00	\$ 6,576.00	\$ 10,399.50	\$ 13,751.00	\$ 12,700.00
70 YEARS AND ABOVE	\$ 14,628.64	\$ 16,054.07	\$ 14,119.03	\$ 21,655.30	\$ 18,510.21	\$ 18,052.33	\$ 20,108.77	\$ 19,577.00	\$ 24,833.00	\$ 26,946.00	\$ 21,626.80
Bachelors degree	\$ 10,000.00	\$ 22,000.00	\$ 15,500.00	\$ 20,000.00	\$ 23,500.00	\$ 21,750.00	\$ 22,500.00	\$ 24,200.00	\$ 25,000.00	\$ 32,000.00	\$ 31,750.00
Doctorate degree	\$ 31,900.00	\$ 50,000.00	\$ 14,625.00	\$ 44,517.50	\$ 46,500.00	\$ 28,500.00	\$ 43,250.00	\$ 23,000.00	\$ 67,500.00	\$ 92,500.00	\$ 57,500.00
High school graduate, or GED	\$ 9,900.00	\$ 12,474.00	\$ 12,500.00	\$ 13,000.00	\$ 17,443.50	\$ 13,640.00	\$ 14,000.00	\$ 16,500.00	\$ 16,625.00	\$ 18,000.00	\$ 20,000.00
Masters degree	\$ 9,150.00	\$ 13,000.00	\$ 11,850.00	\$ 20,000.00	\$ 23,100.00	\$ 15,500.00	\$ 15,310.00	\$ 9,500.50	\$ 42,500.00	\$ 32,400.00	\$ 28,500.00
No school completed	\$ 6,320.00	\$ 10,300.00	\$ 2,980.00	\$ 12,350.00	\$ 18,500.00	\$ 19,552.00	\$ 17,500.00	\$ 19,000.00	\$ 2,703.50	\$ 6,362.50	\$ 8,400.00
Grand Total	\$ 23,579.54	\$ 24,722.74	\$ 25,543.95	\$ 27,501.25	\$ 26,357.99	\$ 27,491.04	\$ 28,473.53	\$ 29,551.46	\$ 30,566.52	\$ 31,117.47	\$ 30,521.77

Table 8. Average wage earnings for ALL, by age and educational attainment 2000-2010, Current Population Survey.

From the above tables we can conclude that average wage earnings will increase as the level of education increases. For people in the U.S. labor market between the ages of 40 to 50 in 2010, when obtaining a high school diploma there is an increase of 95% from no schooling at all; an 80% for obtaining a bachelor's degree in difference to a GED; an 33% from a master's degree compared to a bachelor; and a 34% from a doctorate compare to a masters. The biggest difference is when having at least the high school diploma.

As data shows too, it is suggested that along with the age, the average of wage earnings have a lifecycle.

Figure 6. Average wage earnings for people with Doctorate degree



Source: Table 9

Its peak is reached mainly at age 40, and it stays leveled for a couple of decades and begin to decrease at individuals turn 60 to 70 years old. It makes sense, since most people reaching this age are retiring and decreasing the intensity of time dedicated to

produce income. The biggest jump is from the first range of 0-25 years to 25-30 years, when individuals are expected to have finished high school and college.

Table 9. Average wage earnings of ALL from 2000 – 2010 by age

AVERAGE OF WAGE EARNINGS ALL	YEAR										
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
0 - 25 YEARS	\$ 11,375.07	\$ 11,932.07	\$ 12,310.36	\$ 17,500.28	\$ 10,672.61	\$ 14,170.34	\$ 11,811.33	\$ 11,998.28	\$ 15,539.07	\$ 13,625.69	\$ 13,238.14
25 - 30 YEARS	\$ 21,168.14	\$ 24,901.77	\$ 23,856.60	\$ 25,461.38	\$ 23,581.33	\$ 24,725.47	\$ 24,440.40	\$ 26,222.07	\$ 27,242.60	\$ 26,081.38	\$ 27,462.07
30 - 40 YEARS	\$ 26,457.33	\$ 28,234.27	\$ 29,093.33	\$ 29,769.33	\$ 30,259.00	\$ 31,150.90	\$ 32,940.00	\$ 35,230.73	\$ 33,541.00	\$ 34,603.10	\$ 33,255.23
40 - 50 YEARS	\$ 30,162.47	\$ 30,716.67	\$ 32,902.00	\$ 34,053.33	\$ 34,792.67	\$ 35,155.67	\$ 37,361.70	\$ 38,797.90	\$ 38,356.80	\$ 39,308.00	\$ 38,852.53
50 - 60 YEARS	\$ 30,445.67	\$ 32,377.23	\$ 34,487.03	\$ 34,146.50	\$ 34,333.73	\$ 35,733.87	\$ 36,293.27	\$ 38,229.87	\$ 37,298.93	\$ 37,768.37	\$ 38,696.07
60 - 70 YEARS	\$ 28,070.93	\$ 27,189.13	\$ 28,741.30	\$ 29,043.87	\$ 28,883.80	\$ 31,280.93	\$ 34,224.53	\$ 33,778.53	\$ 35,959.53	\$ 37,216.73	\$ 37,197.77

Source: Current Population Survey, Integrated Public Use Microdata Service IPUMS

Discussion

The data supports the theoretical background used for this study. The empirical evidence suggests that educational attainment and age play an important role in the distribution of earnings, and even more for immigrants entering the labor market in the U.S.

As age and education are key element to earnings, assuming individuals make rational choices depending the financial and economic wellbeing, the decision of investment in human capital for immigrants will depend in this two characteristics. Foreign-born workers will choose to enter the US labor market when the return of investment of immigration is higher than the lifetime earnings in the country of origin. Based on the future expected income flow of earnings according to educational attainment and age, the individual can choose to emigrate.

From the data collected, it is shown that with a master's degree or doctorate degree foreign born employees earn more than native-born. This may be a consequence of quality of immigration selection established by government policies. Foreign workers will earn more in higher level of earnings by the fact that they must have special skills or abilities that native-born lack.

While native-born workers have less motivation to invest in human capital, foreign-born tend to invest in higher level of education and receive higher average wage earnings after completion.

The evidence supports the theory in this paper reviewed, and it suggests that immigration is a wise decision when education and age are taken into account. As age

increases, the lifetime of future income flows and timeline to recover the investment shortens.

According to the data obtained in the Current Population Survey, in higher levels of education the average wage earnings is higher for foreign-born workers than native-born. It is only in the high school and bachelor's degree level, the most common level of education, when native-born have higher earnings.

So, does it mean that foreign-born workers have more motivation to study than native-born workers, and does this translate to a more efficient labor supply? Are immigrants more qualified resulting in better paid workers?

More research needs to be done to address these questions, but for now the conclusions that the empirical evidence of this study suggests are as follow:

- Lifetime average earnings have a lifecycle according to age.
- Foreign-born workers have higher incomes during 2000-2010 when levels of education are no school received, master's degree and doctorate degree.
- Foreign-born workers will decide to invest in human capital, assuming they make rational choices when comparing future flow of earnings vs costs of education.
- Investment in education for foreign-born workers is beneficial when age is further from retirement.

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Appendices

APPENDIX A

Statistical formulation of the earnings distribution equation:

If returns could be treated as constant for essentially an indefinitely long period, this equation could be expressed as

$$E_i = E_0 + \sum_{j=1}^J E_{0j} E_{ij} \quad (1)$$

Where E_{ij} is the amount spent by the i th person on the j th investment, E_{0j} is the rate of return on this investment, and E_0 are the effects of the original capital.

To utilize this information, we have reformulated the analysis to bring out explicitly the relation between earnings and the investment period. The principal device used is to write the cost of the j th “year” of investment to the i th person as the fraction E_{0j} of the earnings that would be received if no investment was made during that year. If for convenience E_{0j} in the equation (1) is replaced by $\bar{E}_{0j} + E_{0j}^*$, where \bar{E}_{0j} is the average rate of return on the j th investment and E_{0j}^* is the (positive or negative) premium to the i th person resulting from his (superior or inferior) personal characteristics, then it can be shown that equation (1) could be rewritten as

$$E_i = E_0 [1 + E_{01}(\bar{E}_{01} + E_{01}^*)][1 + E_{02}(\bar{E}_{02} + E_{02}^*)] \dots [1 + E_{0J}(\bar{E}_{0J} + E_{0J}^*)] \quad (2)$$

Where E_{0j} is the total investment period of the i th person. If the effect of luck and other such factors on earnings is now incorporated within a multiplicative term E_{0j}^* , the log transform of equation (2) is

$$\log E_i = \log E_0 + \sum_{j=1}^J \log[1 + E_{0j}(\bar{E}_{0j} + E_{0j}^*)] + E_{0j} \quad (3)$$

By defining $E_{0j} = \bar{E}_{0j}(1 + E_{0j}^*)$ where E_{0j} measures the “unskilled” personal characteristics of the i th person, and $E_{0j}^* = \bar{E}_{0j} + E_{0j}^*$ where \bar{E}_{0j} is the average fraction for the j th investment, and by using the relation

$$\log[1 + E_{0j}(\bar{E}_{0j} + E_{0j}^*)] \cong E_{0j}(\bar{E}_{0j} + E_{0j}^*) \quad (4)$$

Equation (3) could be written as

$$\log E_i \cong \log E_0 + \sum_{j=1}^J \bar{E}_{0j} E_{0j}^* + E_{0j} \quad (5)$$

where $\bar{y} = \log \bar{y}$, $\bar{y}' = \bar{y} \bar{y}'$, and

$$\bar{y} = \log(1 + \bar{y}) + \sum \bar{y} \bar{y}'^* + \sum \bar{y} \bar{y}' + \bar{y} \quad (6)$$

The term \bar{y} largely shows the combined effect on earnings of luck and ability. If the \bar{y}' was the same for each period of investment, the equation for earnings is simply

$$\log \bar{y} \cong \bar{y} + \bar{y}' \bar{y} + \bar{y} \quad (7)$$

If \bar{y}' the average rate of return adjusted for the average fraction of earnings foregone, and the investment period \bar{y} were known, equation (7) could be used to compute their contributions to the distribution of earnings. For example, they would jointly “explain” the fraction

$$\bar{y}^2 = (\bar{y}')^2 \frac{\bar{y}^2(\bar{y})}{\bar{y}^2(\log \bar{y})} \quad (8)$$

Of the total inequality in earnings, where $\bar{y}^2(\bar{y})$ is the variance of investment periods, and $\bar{y}^2(\log \bar{y})$ is the variance of the log of earnings, the measure of inequality in earnings. Ability and luck together would “explain” the fraction $\frac{\bar{y}^2(\bar{y})}{\bar{y}^2(\log \bar{y})}$, and the (perhaps negative) remainder of the inequality in earnings would be “explained” by the covariance between ability, luck and the investment period.

APPENDIX B

**News Release
Bureau Of Labor Statistics
U.S. Department of Labor**

Foreign-Born Workers: Labor Force Characteristics – 2015

The unemployment rate for foreign-born persons in the United States was 4.9 percent in 2015, down from 5.6 percent in 2014, the U.S. Bureau of Labor Statistics reported today. The jobless rate of nativeborn persons fell to 5.4 percent from 6.3 percent in the prior year.

Data on nativity are collected as part of the Current Population Survey (CPS), a monthly sample survey of approximately 60,000 households. The foreign born are persons who reside in the United States but who were born outside the country or one of its outlying areas to parents who were not U.S. citizens. The foreign born include legally-admitted immigrants, refugees, temporary residents such as students and temporary workers, and undocumented immigrants. The survey data, however, do not separately identify the numbers of persons in these categories. For further information about the survey, see the Technical Note in this news release.

Highlights from the 2015 data:

- In 2015, there were 26.3 million foreign-born persons in the U.S. labor force, comprising 16.7 percent of the total.
- Hispanics accounted for 48.8 percent of the foreign-born labor force in 2015 and Asians accounted for 24.1 percent. (Data in this news release for persons who are White, Black, or Asian do not include those of Hispanic or Latino ethnicity. Data on persons of Hispanic or Latino ethnicity are presented separately.)

- Foreign-born workers were more likely than native-born workers to be employed in service occupations; natural resources, construction, and maintenance occupations; and production, transportation, and material moving occupations. Native-born workers were more likely than foreign-born workers to be employed in management, professional, and related occupations and sales and office occupations.
- The median usual weekly earnings of foreign-born full-time wage and salary workers were \$681 in 2015, compared with \$837 for their native-born counterparts. (Differences in earnings reflect a variety of factors, including variations in the distributions of foreign-born and native-born workers by educational attainment, occupation, industry, and geographic region.)

Demographic Characteristics

The demographic composition of the foreign-born labor force differs from that of the native-born labor force. In 2015, men accounted for 58.3 percent of the foreign-born labor force, compared with 52.2 percent of the native-born labor force. By age, the proportion of the foreign-born labor force made up of 25- to 54-year-olds (73.7 percent) was higher than for the native-born labor force (62.5 percent). Labor force participation is typically highest among persons in that age bracket.

In 2015, nearly half (48.8 percent) of the foreign-born labor force was Hispanic, and almost one-quarter (24.1 percent) was Asian, compared with 10.2 percent and 1.9 percent, respectively, of the native-born labor force. About 16.8 percent of the foreign-born labor force was White and 9.2 percent was Black, compared with 73.4 percent and 12.1 percent, respectively, of the native-born labor force.

In 2015, 23.9 percent of the foreign-born labor force age 25 and over had not completed high school, compared with 4.6 percent of the native-born labor force. The foreign born were less likely than the native born to have some college or an associate degree—16.9 percent versus 29.9 percent. The proportions for foreign-born and native-born persons that had a bachelor's degree and higher were more similar, at 34.9 percent and 39.1 percent, respectively.

Labor Force

The share of the U.S. civilian labor force that was foreign born was 16.7 percent in 2015; it was 16.5 percent in 2014.

In 2015, the labor force participation rate of the foreign born was 65.2 percent, down from 66.0 percent in the prior year. The participation rate for the native born edged down to 62.2 percent in 2015.

The participation rate of foreign-born men was 78.2 percent in 2015, higher than the rate of 67.3 percent for native-born men. In contrast, 52.9 percent of foreign-born women were labor force participants, lower than the rate of 57.4 percent for native-born women.

Among the major race and ethnicity groups in 2015, labor force participation rates for foreign-born Asians and Hispanics declined to 62.6 percent and 68.2 percent, respectively. The rates for foreign-born Whites (58.7 percent) and Blacks (70.8 percent) were little different from the prior year. In comparison, the participation rate for native-born Whites (62.3 percent) declined in 2015, while the rates for Blacks (60.0 percent), Asians (62.4 percent), and Hispanics (63.9 percent) showed little change.

In 2015, foreign-born mothers with children under 18 years old were less likely to be labor force participants than were native-born mothers—57.8 percent versus 73.4 percent. Labor force participation differences between foreign-born and native-born mothers were greater among those with younger children than among those with older children. The labor force participation rate of foreign-born mothers with children under age 6 was 48.8 percent in 2015, much lower than that for native-born mothers with children under age 6, at 68.6 percent. Among women with children under age 3, the participation rate for the foreign born (45.0 percent) was 20.7 percentage points below that for native-born mothers (65.7 percent). The labor force participation rates of foreign-born and native-born fathers with children under age 18 were more similar, at 93.6 percent and 92.4 percent, respectively.

By region, the foreign born made up a larger share of the labor force in the West (24.0 percent) and in the Northeast (19.5 percent) than for the nation as a whole (16.7 percent) in 2015. In contrast, the foreign born made up a smaller share of the labor force than for the nation as a whole in the South (15.5 percent) and Midwest (8.7 percent).