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PROPENSITY TO NATURALIZE AND ITS IMPACTS ON LABOUR MARKET PERFORMANCE AND PUBLIC COFFERS IN THE UNITED STATES OF AMERICA*

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Abstract   Immigration literature in the United States cites poorer economic performance of recent immigrants (arrivals since mid-1980s) than of those who arrived in the past. Massey and Bartley (2005) caution researchers by pointing out that immigrants' economic performance is a function of their legal status in the country. In this paper, we analyze the economic performance of naturalized citizens, who are the most advantaged group of immigrants in terms of civic and economic rights, and yet comprise only 40 percent of the immigrant population in the United States. Data from 2000 census of population are used.

Our econometric and descriptive results indicate that 1) naturalized citizens earn higher labour market incomes than their non-naturalized counterparts in the United States, 2) a household headed by a naturalized citizen remains a source of public funds transfer to the non-immigrant household for a long time after arrival into the country, and 3) an immigrant household headed by a non-citizen is a net recipient of public funds transfers from the non-immigrant household. Impacts of several socioeconomic factors on the propensity to naturalize are also analyzed in an econometric framework.

I. Introduction

The United States of America has been a popular immigrant destination for centuries. According to the United Nations' estimates, around 140 million people, or 2 percent of the world's population, now reside in a country where they were not born. Two-thirds of these people live in Australia, Canada, and most live in the United States. Over the period 1990-2005, the percentage of foreign-born in the country's total population rose dramatically from 7.9 percent to 12.1 percent. This large scale inflow of foreign born has generated a public debate in the United States over their economic and social integration. This paper aims to contribute to that debate through an analysis of one integration tool, namely citizenship acquisition.

A wide body of literature has emerged to analyze the economic performance of immigrants to the United States.[1] However, one caveat in this literature is that it does not distinguish between the legal status of immigrants, which is defined in this paper as naturalized citizens, legal immigrants, legal non-immigrants, and undocumented migrants. As Massey and Bartley (2005) have noted, the economic performance of these status groups may differ from each other due to their differential treatment under US law, which in turn may affect their economic opportunities. Since 1986, changes in US immigration laws have resulted in penalties on undocumented migrants and legal non-immigrants while increasing the relative advantages for naturalized citizens and legal immigrants.[2] At the same time, changing economic and political conditions around the world have resulted in an increase in the relative share of undocumented migrants and legal non-immigrants in the total foreign-born population of the United States. However, separate data on the socioeconomic characteristics of these two status groups are not available from either the population census, or from the Current Population Survey micro data, both of which have been used extensively to analyze the economic performance of immigrants. However, aggregating across all groups regardless of immigrant status, much of the recent research on the economic performance of this overall immigrant stock has documented a declining economic performance of immigrants.[3]

Given the focus of this book and the noted data limitations, in the present chapter I analyze the economic performance of one group of immigrants in the United States, i.e., naturalized citizens. Of course, this is the most legally advantaged group of US immigrants. I also provide comparative results for noncitizens, and the native-born citizen population. I argue in

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[1] For example, Blau (1984), Simon (1984), Borjas (1991, 1996, 1999), etc.
[2] The effectiveness of these sanctions however has been questioned.
[3] For example, Borjas (2002a).

particular that if the results of the present study, which concentrates on citizenship acquisition, differ from the conventional immigration research as cited above, then future research on the economic performance and impact of immigration with the attendant policy implications must pay attention to the different legal status of this segment of the US population.

In section II, I discuss the possible factors that motivate immigrants to acquire citizenship in the United States. Section III analyzes the impact of some well-known demographic and economic characteristics on the decision to acquire US citizenship. In turn these variables and citizenship status are known to affect the economic performance of naturalized immigrants. While econometric estimates of their impacts on citizenship acquisition are available from past research, I update those results to enable their comparison with those found for other countries.[4] I also estimate a slightly different econometric model than used in previous US research to incorporate the effect of the economic conditions existing in the source country of immigrants. Section IV analyzes the impact of naturalization on the labour market earnings of foreign-born individuals by their citizenship status. This extension of the analysis is motivated by Borjas (2002a and 2002b) who observes that welfare participation rates of naturalized citizens are greater than those of non-citizens. Thus this analysis of post-citizenship income can provide some idea of an individual's tax payments as an offset for the presumed increased receipt of public money. These results are presented in Section V. Section VI concludes the study.

II. Motivation for citizenship acquisition for a United States immigrant

Under the Immigration and Nationality Act (INA), (1922) the United States Congress has established certain requirements that must be fulfilled by naturalized citizens. In sum, these requirements include residency and physical presence, good moral character, attachment to the constitution, language, good knowledge of United States government and history, the Oath of Allegiance and the renouncement of citizenship of the country of origin.[5]

Just as in other countries, United States citizenship has its attendant privileges. A citizen can vote, be elected to public office, serve on a jury, enjoy government protection while traveling abroad, and most importantly gain expedited entry of family members to the United States. In addition, certain government benefits that are not available to non-citizens are available to

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[4] For example, Jasso and Rosenzweig (1990), Bueker (2005, 2006) and Yang (1994) have analyzed the impact of economic and demographic characteristics of individuals on the probability of naturalization in the United States.

[5] For a review of current rules of naturalization in the United States, please see Bloemraad (2006).

citizens who can also meet potentially preferential tax requirements that are different from those of non-citizens.[6]

Despite the above privileges available to citizens, the economic value of citizenship acquisition in the United States has diminished over time due to the increasing rights of permanent residents and loosened naturalization rules. For example, in 1986, the required residence time in the United States necessary for a US citizen married to an alien to be able to automatically transmit US citizenship to a child born abroad was reduced from ten years to five years. The period of time after naturalization before a naturalized citizen can reside abroad was also reduced from five years to one year in 1986. Until 1994, a naturalized citizen could lose citizenship by setting up a permanent residence abroad within one year following US naturalization. This provision was repealed by Congress in 1994. Furthermore, as Yang (1994) has noted, occupations including practicing as an accountant, architect, attorney, dentist, physician, private detective, funeral director, liquor dealer, etc. that were available to only US citizens in the past, can now be practiced by all permanent residents, including citizens and non-citizens.[7]

To offset some of the dilution in the economic value of citizenship ascension, the United States Congress introduced a Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) in 1996. That Act excluded non-citizens, even if permanent residents, from welfare programs and allowed the states to introduce further restrictions.[8] In the same year, an Illegal Immigration Reform and Immigrant Responsibility Act (IIRIRA) was introduced which made it more difficult for legal non-naturalized immigrants to sponsor their relatives for entry to the United States, which of course would place a premium on citizenship acquisition to accelerate family reunification.[9]

The results of the above two reforms created a flux of applications for naturalization towards the end of 1990s. This outcome generated a new debate in the US political and academic circles on the motivation to naturalize, as discussed below.

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[6] http://uscis.gov/gtraphics/citizenship/becoming/htm

[7] Two other examples of relaxing citizenship rules include 1) rights granted to an unmarried mother to transmit her US citizenship to a child born abroad, and 2) faster eligibility of citizenship of those immigrant military personnel who enlisted after September 11, 2001 (the $320 application fee was also waived and soldiers were permitted to attend naturalization ceremonies at military bases and consulates abroad.

[8] The PRWORA had a broader objective of reducing the potential work disincentive effects of welfare schemes and applied to all US residents.

[9] For further details of how new naturalization rules compare with those in the past, please see Jasso and Rosenzweig (1990) for rules that applied in the 1980s and to Bloemraad (2005) for more recent rules.

Borjas (2002a) holds that eligibility for participation in welfare programs is a strong motive for naturalization. His study shows that welfare participation rates among households headed by naturalized citizens rose after 1996 and at the same time, a decline was observed among households headed by non-citizens.[10] This result led him to conclude that "many immigrants will become citizens not because they want to fully participate in the United States political and social systems, but because naturalization is required to receive welfare benefits."[11] On the other hand, using the Current Population Survey data from 1994/95 to 2000/01, Balistreri and Hook's (2004) econometric study showed that the 1996 welfare reforms did not change the social and economic determinants of naturalization in the case of Mexican immigrants. These authors also analyzed the impact of IIRIRA and concluded that policies that restricted an immigrant's ability to sponsor relatives for legal migration tend to encourage the propensity to naturalize.[12]

A third, and a more recent motivating factor for naturalization in the United States may be the anxiety resulting from the attack of September 11, 2001. This event resulted in strict anti-terrorist measures that may have prompted many US foreign-born residents to become citizens due to the perception that doing so might help avoid unpleasant integration experiences. However, no evidence of this exists in the literature, to date.

In sum, the recent literature portrays a complex set of motives (economic, social and political) to motivate recent US immigrants to ascend to citizenship. However, I will argue that many of these forces can be characterized as either increasing the costs on non-citizenship or raising the benefits of citizenship acquisition, and will develop a broad economic model to incorporate these features.

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[10] Welfare payments included cash benefits, Medicaid, and food stamps.

[11] Before this study, Espenshade, Baraka and Huber (1997) had drawn similar implications of the welfare reforms.

[12] Prior to the above two studies, Yang (1994) had also noted that accelerated processing of family reunification immigrants to the United States was a very strong motivation for immigrants in general to acquire United States citizenship. An immigrant permanent resident who is a non-citizen can only sponsor his or her spouse and unmarried children as immigrants within a numerically limited category. Sponsorship under this category accounts for only 26 percent of all numerically limited categories. On the other hand, a citizen can sponsor not only his or her immediate relatives with no numerical restriction, but also their unmarried or married adult children and their siblings. Such sponsorships make up about 54 percent of all numerically limited categories. In sum, the earlier the immigrant becomes a citizen, the shorter the waiting time for his / her relatives to immigrate.

Econometric analysis of an individual's decision to acquire United States citizenship

Since it is the thesis of this chapter that a cost-benefit analysis best informs citizenship acquisition, I will employ a modified human capital model to further the analysis. This model in turn argues that an individual's demographic, social and economic characteristics, as well as the economic conditions of the country of origin determine citizenship acquisition in the United States. At least two reasons can be advanced to highlight the importance of analyzing citizenship acquisition decision in the United States: first, since the said characteristics also determine the socioeconomic success of an immigrant and are influenced by US immigration laws, it can be argued that immigration law determines the long- term benefits of immigration for the individual as well as for US society. Second, since US citizens are allowed to sponsor their foreign-born parents, siblings, spouses and children, a greater number of immigrants ascending to US citizenship could result in an increase in immigrant applications from this section of its foreign-born population. If this is the case, then greater participation in the political process and in the country's welfare programs can be expected. Hence, the impact of the socioeconomic and demographic characteristics on citizenship acquisition should be of interest to politicians, who may like to see greater numbers of voters in their constituencies.

Demographic characteristics that may affect an individual immigrant's naturalization decision are reflected in four variables: namely, age and a set of three dummy variables representing marital status, gender, and the presence of children under 15. An older immigrant – up to a point – is more likely to naturalize as the resulting benefits increase and the costs of forgoing their previous citizenship decrease with age. Yang (1994) has further argued that a married immigrant is more likely to naturalize than a single person because such a person has a more stable environment and also because families have more extensive contacts with US institutions, thereby making it easier to integrate.

Some research has shown that the rate of naturalization is significantly higher among women than among men (Alvarez 1987; Yang 1994). Portes and Curtis (1987) have also shown that the propensity to naturalize increases with the presence of children in the household. In contrast, Yang argues that men would be more likely to naturalize since they may receive greater economic benefits from ascension.

Economic and labour market characteristics that may influence an immigrant's ascension decision are reflected in their earned income, weeks worked during the year, and a set of three dummy variables representing education, occupation, and home ownership status. These variables

in total reflect the immigrants' degree of economic adaptation to the United States and in turn raise the costs of returning home.

Citizenship acquisition hinders an immigrant's ability to return home in the absence of dual citizenship, and Portes and Rumbaut (1990) have argued that less favorable conditions in an immigrant's country of origin also reduce the reversibility of migration flow and therefore increase the probability of naturalization. Hence, to incorporate the effect of economic conditions of the country of origin, I have included the ratio of GDP per capita in country of origin to that in the United States.[13]

The probability of naturalization may also be a function of time spent in the United States as greater social and economic integration is expected with the length of stay. Hence, the number of years since migration variable is also added to my model.

Finally, many authors have suggested that an immigrant's propensity to naturalize in the host country is also affected by dual citizenship laws in his/her country of origin as well as in the host country. If an immigrant must sacrifice his/her citizenship of the country of origin to ascend to US citizenship, this may impose two costs on the individual. First, the individual could lose access to labour market opportunities in the country of origin. Second, he or she could incur a psychological cost by being viewed as a foreigner among friends and family members in country of origin. Hence, the possibility of losing one's citizenship status in the country of origin could be a deterrent for naturalization in the United States.

Acquisition of US citizenship requires renouncing of any foreign allegiance.[14] This requirement is generally interpreted to mean that naturalized citizens cannot hold dual citizenship. However, some literature (Jasso and Rosenzweig 1990; Bloemraad 2006) suggests that this is a *de facto* requirement. Immigrants are not required to provide any documents proving official renouncement of their foreign citizenship. As a result, one may expect some confusion in the interpretation of the US government's stand on dual citizenship. However, one may assess the impact of dual citizenship laws by considering if the country of origin allows dual citizenship. Hence, I include a dummy variable in the ascension model to represent if the country of origin allows dual citizenship to reflect the increased cost of becoming a US citizen.

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[13] A more precise statement of sending country conditions would also incorporate the effect of the political conditions in country of origin. One may expect this to be vaguely captured by the country's GDP per capita.

[14] The Oath of Allegiance begins as "I hereby declare, on oath, that I absolutely and entirely renounce and abjure all allegiance and fidelity to any foreign prince, potentate, state or sovereignty of whom or which I have heretofore been a subject or a citizen…" (Jasso and Rosenzweig 1990).

II.1. Data used for analysis

The study is based on microdata obtained from a 5 percent sample of the United States population census conducted in 2000. This sample is included in the Integrated Public Use Microdata Series (IPUMS) produced by the Minnesota Population Center, University of Minnesota.[15] The census sample is a weighted national sample of approximately 6,184,438 households and 14,081,466 person records. The analysis was limited to 578,248 immigrants 25–65 years of age, who by the census date had lived in the US a sufficiently long period of time to be eligible for naturalization.[16] The unit of analysis is the household head who had worked for at least one week during 1999 and for whom wages and salaries earned during that year were positive. Mexican immigrants were excluded from this citizenship study for two reasons. First, since Mexico is a part of the North American Free Trade Agreement (NAFTA), Mexicans may view the benefits of US citizenship differently from other immigrants.[17] Second, a large number of Mexican immigrants in the US are residing there illegally and no separate information on their legal status is available in the population census or in the population survey. Hence, their exclusion from our analysis reduces any potential bias in our estimates.

II.2. Sample characteristics

Table 1 provides the mean values for the outlined selected demographic and economic characteristics of naturalized citizens and non-citizens in the US, which broadly reflect the human capital factors that influence the costs and benefits of citizenship acquisition. These persons have in turn been broadly grouped as originating from developed and developing countries. We find some noticeable differences between the characteristics of naturalized citizens originating in a developing or a developed country.

The average naturalized citizen in either development group is about 4 years older than a non-citizen and is more likely to be married and with fewer children aged under 15 than a non-citizen. An immigrant coming from a developing country tends to acquire US citizenship sooner. This finding is consistent with DeVoretz and Pivnenko's (2006) finding for Canada and confirms that immigrants from developing countries are more likely to benefit from citizenship acquisition

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[15] The IPUMS consists of 38 high-precision samples of the American population drawn from 15 federal censuses and from the American Community Surveys of 2000-2004. For detailed information about this database, the reader is referred to http://www.ipums.org/usa/.

[16] To be eligible to apply for US citizenship, a person must have lived there for at least five years and be a legal resident.

[17] This may be especially so because of greater mobility of workers across US-Mexico borders allowed under NAFTA

than their developed country counterparts. This could be partly because such immigrants tend to have larger families so that they tend to benefit more from acquiring the right to sponsor relatives, which comes with citizenship acquisition. We also plot this result in Figure 1 for selected developed and developing country immigrants.

Once naturalized, a developing country immigrant is more likely to work in a professional and managerial occupation. In contrast, the occupational status does not vary by citizenship status for an immigrant who comes from a developed country, as is also the case with respect to his/her educational attainment. On the other hand, a naturalized citizen who arrives from a developing country is more likely to have acquired a university degree than his/her developed country counterpart.

A naturalized citizen is more likely to own a house in the United States. The effect of citizenship acquisition on home ownership is stronger for citizens who originate from a developing country.

The labour market variables indicate that a naturalized citizen who comes to the United States from a developing country works more weeks than his/her non-citizen counterpart and also more than a person from a developed country. Such a citizen also earns about 50 percent more income than a non-citizen, while citizenship status has no effect on the income of the person who comes from a developed country. In sum, an immigrant from a developing country who eventually naturalizes may accumulate more human capital and work more weeks in anticipation of exploiting the prospect of post-citizenship earnings gain. Moreover, these cited characteristics of naturalized US citizens are consistent with those found for naturalized citizens in Canada (DeVoretz and Pivnenko 2006). We now turn to a formal analysis of the impact of these characteristics on the propensity for naturalization.

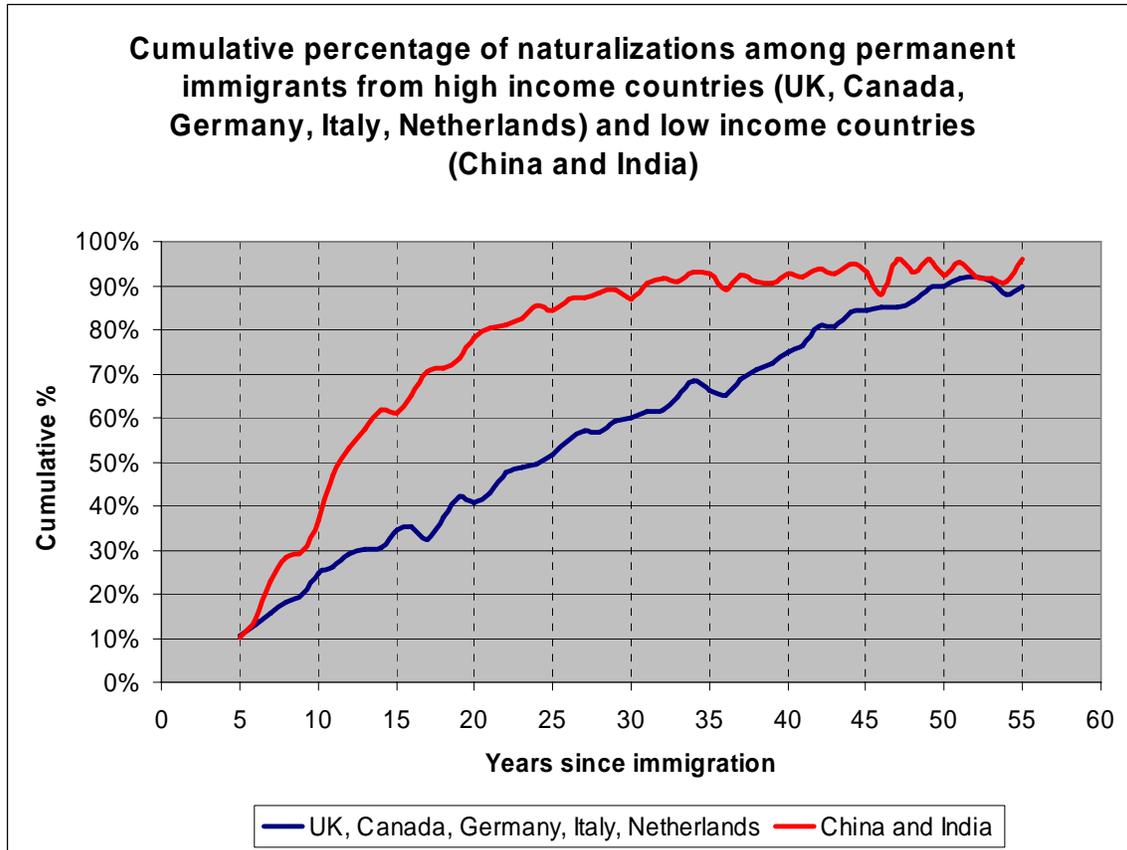| Table 1: Descriptive statistics for immigrants to the US, age 25-65, over 5 years since immigration (Mexican immigrants excluded)				
	Developed countries		Developing countries*	
	Naturalized citizen	Not a citizen	Naturalized citizen	Not a citizen
Sample size	83,943	57,463	250,931	175,898
Age, mean	48.16	43.86	44.29	40.34
Years since immigration, %				
6-10	3.92%	25.34%	11.43%	39.75%
11-15	7.35%	19.09%	17.32%	26.66%
16-20	9.72%	14.59%	22.54%	17.51%
21-25	12.60%	11.30%	18.17%	7.55%
26-30	13.98%	9.13%	13.07%	4.45%
over 30	52.43%	20.55%	17.47%	4.08%
Marital status				
Married, spouse present, %	71.08%	68.58%	68.54%	59.61%
Married, spouse absent, %	1.71%	2.18%	3.48%	6.21%
Separated, %	1.70%	2.17%	3.04%	4.76%
Divorced, %	11.08%	10.79%	9.26%	7.90%
Widowed, %	3.56%	2.27%	2.57%	2.20%
Never married, %	10.86%	14.00%	13.11%	19.32%
Females, %	55.61%	55.18%	52.57%	49.12%
Presence of eldest child under 15, %	19.43%	27.14%	28.15%	31.47%
Occupation				
Professional, %	23.27%	24.33%	24.81%	16.28%
Managerial, %	16.21%	16.82%	12.22%	8.49%
Education				
Above high school or diploma, %	27.32%	26.64%	26.22%	18.58%
Bachelor degree, %	19.80%	20.38%	21.48%	13.00%
Master's or professional degree	11.42%	11.27%	12.23%	8.93%
Doctorate, %	2.21%	3.75%	2.12%	2.33%
Home ownership, %	78.63%	66.35%	68.01%	43.28%
Weeks worked, mean	36.71	36.35	38.50	35.28
Wage and salary income, mean	$32,597	$32,219	$30,614	$21,372
Total personal income, mean	$41,375	$38,945	$36,192	$24,398
* Source countries are divided into two groups based on $14000 GDP per capita threshold ** De-scaled weights obtained by dividing each observation's weight by the mean weight, were applied.				

Figure 1

Cumulative percentage of naturalizations among permanent immigrants from high income countries (UK, Canada, Germany, Italy, Netherlands) and low income countries (China and India)

Table 2: Logistic regression results (dependent variable: CTZN (1=US citizen, 0=otherwise)						
	Developed Country immigrants			Developing country immigrants		
	Coefficient	t-value	Odds ratio	Coefficient	t-value	Odds ratio
Constant	0.448	6.411	1.565	-2.650	-65.140	0.071.
Age	--0.0256	-15.100	0.974	0.003	2.446	1.003
Age squared	0.00014	8.500	1.00	0	4.981	1.000
Years since immigration	0.087	148.610	1.091	0.094	194.53	1.098
Female	-0.015	-1.230	.0985	0.220	30.425	1.246
Married	0.105	7.754	1.111	0.159	19.100	1.172
Presence of Children Under 15	-0.060	-3..687	0.942	-0.025	-2.870	0.976
University Degree	0.161	11.174	1.175	0.411	43.775	1.508
Professional Occupation	0.068	3..650	1.059	0.152	14.543	1.164
Home ownership	0.290	21.754	1.337	0.580	80.209	1.786
Natural logarithm of total income	0.040	7.693	1.037	0.063	21.911	1.065
Ratio of the source country GDP per capita to that of the US	-2.920	-64.003	0.054	-0.867	-17.513	0.420
Dual citizenship	-0.350	-29.226	0.704	-.052	-6.375	0.949
Log Likelihood function	-186750.2			-479447.2		
Cox & Snell R-square)	0.23163			0.216		
Chi-squared	48019.8			105293.8		
Notes: See Table1 for respective sample sizes. Odds ratio is the anti-log of each coefficient and is interpreted as the change in the odds of becoming a naturalized US citizen associated with a one-unit change in the independent variable (in case of dummy independent variable, the change is from 0 to 1.						

II. 3. *Econometric model used to analyze the probability of citizenship acquisition*

Following the existing econometric literature, we estimate a logistic regression model to analyze the effects of the explanatory variables on the probability of citizenship acquisition in the United States.[18] The model takes the form:

$$Ln [p_i / (1 - p_i)] = a + \Sigma\, b_i\, X_i + e$$

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[18] Aldrich and Nelson (1984) as well as Hanushek and Jakson (1977) suggest the estimation of logistic regression if the dependent variable is a dummy variable, as in this case where a dummy variable representing citizenship status is used (the value of this variable equals 1 if the individual is a naturalized citizen and 0 otherwise). Afifi and Clark (1990) further suggest that logistic regressions do not require any assumptions regarding the distributions of the predictive variables. Hence, logistics regressions are appropriate where the predictive variables are a combination of discrete and continuous variables.

where Ln [p_i / (1 - p_i)] is the logged odds of becoming a naturalized citizen in the US, a is the intercept, X_i's are the independent variables, b_i's are the coefficients and e is the error term. The coefficients are interpreted as the change in the logged odds of becoming a naturalized US citizen when there is a unit change in the independent variable, keeping the other independent variables constant. In cases where the independent variable is a dummy variable, the effect is measured when the corresponding variable changes its value from 0 to 1.

To facilitate the interpretation, we consider the odds ratios, which are the anti logs of the logged odds. Odds ratios are interpreted as the change in the odds of becoming a US citizen associated with a one-unit change in the independent variable, net of other variables in the model. In cases where the independent variable is a dummy variable, the coefficient represents the change in odds between categories. An odds ratio above 1 indicates increased odds of becoming a naturalized citizen for a unit change in the corresponding independent variable, and in cases where the independent variable is a dummy variable, it represents the increased odds between the categories. An odds ratio of 1 indicates no difference and a ratio below 1 indicates decreased odds. Since the sample size is very large, tests of significance (t-tests) are not very useful. Hence, our interpretation of results will largely focus on the patterns and the effective size of the odds ratios.

As I argued earlier, the costs and benefits of citizenship acquisition may vary by the immigrant's country of origin. Hence, separate equations are estimated for developed and developing country immigrants.[19]

II. 4. Results of citizenship acquisition model

The results for the logistic regression are reported in Table 2, which also includes the results for the odds ratios.

The goodness of fit statistics associated with the two equations are reported at the bottom of Table 2. The explanatory power of each model is given by the chi-squared statistic, with degrees of freedom equal to the number of independent variables (excluding the intercept term) in the model. It is observed that each chi-squared value is statistically significant at 0.01 or 0.05 levels of significance, which gives strong confidence to the explanatory power of each model. The predictive value of the developing country immigrant equation is greater than the estimated equation for the developed country immigrant.

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[19] Bueker's (2005) analysis also shows that country of origin is a statistically significant determinant of citizenship acquisition in the United States.

It is seen from Table 3 that the developing country immigrants' logistic equation all contain variables have t-values greater than 2, i.e., the critical t-value at 0.05 level of significance. In the case of the developed country immigrant equation, only the "female" variable has a lower t-value and hence does not pass the t-test of statistical significance. However, as we mentioned before, the large sample sizes used for estimation may be causing the t-values to be high, thereby reducing the credibility of the t-test of significance. Hence, we will only interpret the odds ratios.

Most of the reported odds ratios in both models are greater than 1, indicating that the included demographic and adaptation characteristics of immigrants do a good job of predicting the likelihood of citizenship acquisition. The odds of acquiring US citizenship are similar for individuals who have identical post-schooling experience, regardless of whether they come from a developing or a developed country. Immigrant women coming from developed countries are less likely to naturalize than their male counterparts while the opposite is true for immigrant women who come from developing countries. The presence of children aged under 15 reduces the odds of acquiring US citizenship in both immigrant groups which is a surprising result. University education, professional qualifications, home ownership and income increase the odds of acquiring citizenship in both groups, however, the impacts of these variables are greater for developing country immigrants. As revealed by the coefficient of the GDP ratio, the odds of acquiring citizenship decrease as one comes from a relatively prosperous country in each group. The presence of dual citizenship in country of origin reduces the odds of acquiring US citizenship which is also contrary to our expectations.

The greatest difference in the two groups is observed in the impact of home ownership where, compared to a person who does not own a home, the odds of acquiring citizenship increase for a home owner who came from a developing country by 1.34 times more than for a developed country immigrant. Persons with a university degree in the developing country sample are 1.29 times more likely to ascend to US citizenship. We now turn to an estimation of how labour market rewards citizenship acquisition in the United States.

III. Wage equations for citizens and non-citizens

While citizenship acquisition increases entitlements of individuals in welfare schemes, it also enhances their labour market opportunities. Hence, any analysis of the potential public treasury effect of naturalization should not only consider the effect on welfare receipts but also the impact on income of individuals which in turn determines their public treasury contribution. In the present section, we analyze the impact of naturalization on one indicator of labour market

performance of immigrants, i.e., the labour market earnings and compare the same with the earnings of non-citizens.

Separate earnings equations are estimated for naturalized citizens and non-citizens and within each group, I have also performed separate estimations for developed and developing country immigrants. Furthermore, to isolate the compounding effect of gender discrimination on annual wages, I also estimate separate equations for males and females. The specification of each wage equation is based on human capital theory which views education as the single most important determinant of earnings.

To capture the effect of citizenship acquisition on annual wages, an expanded wage equation is specified in which the natural logarithm of annual wages is considered as the dependent variable. The independent variables include age (as a proxy for post-schooling experience); age-squared (to account for the concavity of age-earnings profile); years since migration (to isolate the effect of citizenship status from the United States labour market experience effect on earnings) logarithm of weeks worked during the year (to control for any labour supply effect on earnings); and a set of dummy variables for the citizenship status, different education levels, occupations, and full time weeks worked. Results of our estimation are provided in Table 3.

All OLS coefficients yield the predicted signs owing to human capital theory. Of primary interest is in the coefficient of the dummy variable representing citizenship acquisition. In case of immigrants arriving from <u>developed</u> countries, the magnitude of this coefficient is small and the corresponding t-value is below its critical value of 2. [20] Hence, citizenship acquisition alone does not have a statistically significant effect on the log of annual wages of developed country immigrants. However, a larger and statistically significant effect of citizenship acquisition on the log of annual wages is found in case of immigrants arriving from developing countries. In both samples, the results do not vary by gender.

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[20] All tests of significance are performed at a 0.05 level of significance.

Table 3: OLS estimation of log-linear earnings model: citizenship effect on immigrant earnings (Dependent variable is Log of earnings).				
	Developed countries (GDP per capita > $13,999)		Developing countries (GDP per capita < $14,000)	
	(1) Females	(2) Males	(3) Females	(4) Males
(Constant)	4.660 (76.519)	4.456 (66.070)	4.935 (158.331)	5.175 (170.437)
Age	.026 (10.024)	.071 (25.059)	.026 (18.581)	.041 (31.028)
Age squared	-0.0003 (-9.804)	-.001 (-22.137)	-0.0003 (-19.353)	.0004 (-31.164)
Years since immigration	.003 (9.676)	.001 (4.021)	.008 (35.463)	.010 (49.376)
LN(weeks)	.969 (153.274)	.825 (90.744)	.879 (265.610)	.766 (201.780)
Naturalized citizen (reference group is non-citizens)	**.021** **(2.973)**	***-.010*** ***(-1.341)***	**.092** **(23.809)**	**.107** **(29.317)**
Education (Reference group is high school graduate or less)				
Above high school or diploma	.195 (24.289)	.121 (13.035)	.201 (45.477)	.158 (36.387)
Bachelor degree	.388 (39.647)	.361 (35.569)	.384 (75.107)	.331 (64.877)
Master's or professional degree	.544 (43.706)	.555 (46.102)	.539 (81.168)	.620 (102.866)
Doctorate	.611 (25.234)	.539 ()30.377	.607 (41.427)	.668 (69.150)
Occupation (Reference group is skilled and low skill occupations)				
Professional occupation	.263 (30.899)	.234 (23.967)	.371 (78.835)	.344 (69.938)
Managerial occupation	.322 (33.402)	.399 (44.984)	.310 (50.316)	.320 (64.559)
Status of weeks worked (Reference group is of those who worked part time weeks e.g. 34 hours or less)				
Full time weeks worked	.847 (111.557)	.927 (67.927)	.750 (166.812)	.816 (127.351)
Adjusted R Square	.544	.363	.542	.442
F-statistics	4857.743	2367.483	15061.919	11692.251
*Note: t-statistics is given in brackets				

In order to investigate any possible occupational effect on the impact of post citizenship earnings, I further augment my model by adding an interaction dummy variable which is obtained by multiplying the dummy variable for naturalized citizenship with that for professional

occupation status. This interactive variable represents an individual who is a naturalized citizen and has worked in a professional occupation. Thus the coefficient of this variable should indicate the earnings effect of working in a professional occupation given that citizenship acquisition has occurred. The results of the augmented model are presented in Table 4.

Table 4: OLS estimation of log-linear earnings model: citizenship effect on immigrant earnings (dependent variable is logarithm of annual wages).				
	Developed countries (GDP per capita > $13,999)		Developing countries (GDP per capita < $14,000)	
	(1) Females	(2) Males	(3) Females	(4) Males
(Constant)	4.672 (76.629)	4.471 (66.201)	4.928 (158.032)	5.171 (170.243)
Age	.026 (9.997)	.071 (25.019)	.026 (18.569)	.041 (30.997)
Age squared	.0003 (-9.766)	-.001 (-22.096)	.0003 (-19.339)	-0.0005 (-31.125)
Years since immigration	.003 (9.415)	.001 (3.797)	.008 (35.681)	.011 (49.594)
Naturalized citizen	.005 (.642)	-.027 (-3.062)	.104 (24.028)	.116 (28.769)
Naturalized citizen in professional occupation	.055 (3.892)	.061 (4.012)	-.051 (-6.232)	-.043 (-5.375)
Above high school or diploma	.195 (24.300)	.121 (13.093)	.199 (45.079)	.156 (35.984)
Bachelor degree	.387 (39.591)	.361 (35.542)	.383 (74.906)	.330 (64.628)
Master's or professional degree	.543 (43.597)	.554 (46.050)	.538 (80.876)	.618 (102.337)
Doctorate	.616 (25.413)	.544 (30.592)	.601 (40.893)	.663 (68.349)
Professional occupation	.230 (19.342)	.197 (14.851)	.406 (55.229)	.372 (52.007)
Managerial occupation	.323 (33.432)	.398 (44.896)	.309 (50.115)	.319 (64.362)
LN(weeks)	.969 (153.299)	.825 (90.749)	.879 (265.602)	.766 (201.758)
Full time weeks worked	.846 (111.535)	.926 (67.906)	.750 (166.836)	.816 (127.406)
Total degrees of freedom	48,877	49,852	152,917	176,948
Adjusted R Square	.544	.363	.542	.442
F-statistics	4486.535	2187.268	13909.738	10796.771
*Note: t-statistics is given in brackets				

In both samples, the coefficient of the interaction variable is statistically significant, indicating the presence of occupational effects on returns to citizenship acquisition. In the developing country case, this effect is negative indicating that the returns to citizenship are lower for those developing country immigrants who work in professional occupations. This result reflects the lack of foreign credential recognition, which will be discussed in the concluding section. However, as was indicated by the coefficient of the professional occupation dummy variable in Table 4, the overall returns to professional occupations are greater for developing country immigrants (once the effect of citizenship has been isolated).

The wage equation results showed that naturalization has a statistically significant and positive effect on the earnings of immigrant men and women who arrive from developing countries. For developed country immigrants, the effect is statistically significant only in case of women. Human capital theory attributes earnings differentials between individuals mostly to human capital endowments (education and labour market experience). Therefore, I analyze the effect of human capital variables on the wage differential observed between naturalized citizens and non-citizens. To achieve this task, I decompose the wage differential observed between citizens (C) and non-citizens (N) in each group into the component responsible for differences in human capital endowments and the component responsible for differences in market rewards for human capital endowments. This decomposition allows one to assess if citizenship acquisition results in greater returns to human capital investment. The technique used for this decomposition of wage differential follows the technique first suggested by Oxaca (1973)[21]. Using his technique, the difference in logarithm of wage earnings between naturalized citizens and non-citizens in each group can be written as follows:

$$\ln W_C - \ln W_N = (\overline{X}_C - \overline{X}_N)^T \hat{\beta}_C + \overline{X}_N^T (\hat{\beta}_C - \hat{\beta}_N)$$

The first part of the above equation, i.e., $(\overline{X}_C - \overline{X}_N)^T \hat{\beta}_C$, is the component of wage differential that is attributed to difference in human capital endowment between citizens and non-citizens in each group. The second part of the above equation, i.e., $\overline{X}_N^T (\hat{\beta}_C - \hat{\beta}_N)$, is the component of wage differential that is attributed to the differences in market rewards for human capital endowments of citizens and non-citizens. In other words, the second part measures the

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[21] Oxaca (1973) used this technique to decompose the earnings differential between men and women in the United States into the component attributed to differences in productivity-related characteristics and the component attributed to differences in labour market reward for each productivity-related characteristic. This technique has now become a standard technique in labour market literature to analyze earnings differences between demographic groups.

difference in logarithmic wage earnings of those individuals in each group who possess the same capital endowments. The anti-log of each part of the above equation is used to compute the percentage difference. Results are reported in Tables 5 and 6 using the equation results reported in Tables 3 and 4, respectively.

TABLE 5: DECOMPOSITION OF WAGE DIFFERENTIALS BETWEEN NATURALIZED CITIZENS AND NON-CITIZENS IN THE US: POPULATION OF FOREIGN-BORN EMPLOYEES 18-65 YEARS OLD WHO IMMIGRATED OVER 5 YEARS AGO			
Source country status	Human capital endowment effect	"Discrimination" component	Wage differential
Females			
Developed	8.48%	2.04%	10.53%
Developing	26.83%	7.05%	33.87%
Males			
Developed	9.07%	-2.12%	6.95%
Developing	28.55%	8.12%	36.67%
Source: Author's calculations based on Oxaca decomposition using results of Table 2 and averages of education and age variables.			

TABLE 6: DECOMPOSITION OF WAGE DIFFERENTIALS BETWEEN NATURALIZED CITIZENS AND NON-CITIZENS IN THE US: POPULATION OF FOREIGN-BORN PROFESSIONAL EMPLOYEES 18-65 YEARS OLD WHO IMMIGRATED OVER 5 YEARS AGO			
Source country status	Human capital endowment effect	"Discrimination" component	Wage differential
Females			
Developed	8.73%	7.12%	15.85%
Developing	15.52%	3.51%	19.03%
Males			
Developed	8.92%	3.64%	12.56%
Developing	13.82%	5.22%	19.04%
Source: Author's calculations based on Oxaca decomposition using results of Table 3 and averages of education and age variables.			

All of the decomposition of wage differentials shows that human capital variables cause the earnings of citizens to be higher than those of non-citizens. The effect on the wage differential is higher for developing country immigrants than in the case of developed country immigrants. The effect is also greater for men. Acquisition of citizenship raises the returns from human capital more for developing country immigrants than for developed country immigrants. Furthermore, most of the wage differential attributed to human capital variables arises due to differences in human capital endowments and not due to differential market rewards for human capital endowments

IV. Effects of naturalization upon public coffers

As mentioned earlier, Borjas (2002b) has shown that foreign-born citizens of the United States tend to participate more in welfare programs than do the native-born citizens. In fact, he also uses this evidence to argue that eligibility to participate in welfare programs is a strong motivation for naturalization. However, to review the overall impact on public coffers, one should compare the receipts of transfer payments and usage of public services by naturalized citizens with their tax payments. We provide this comparison in the present section. For this purpose, we use micro-data based on the latest US population census conducted in 2000. Our unit of analysis is a household. Following previous literature (Simon 1984) we define an immigrant household to be one in which either only the male spouse or both male and female spouses are immigrants.[22]

The first part of our analysis concentrates on the use of public transfers and services by immigrant and non-immigrant households. The census asked questions about the receipts of important transfer payments. It also collected information about participation in Medicare and Medicaid programs, which we were able to combine with published data on per capita costs of these programs to obtain dollar estimates for immigrant and non-immigrant households. The census did not task questions about the participation of children in each household in elementary/secondary schools. However, we were able to use the number of school age children, i.e., children aged 6-18, with the published data on per pupil cost to estimate the taxpayers' cost incurred in each household for the provision of public education. We obtained all estimates of transfer payments, health care costs and educational costs (at elementary/secondary levels) separately for each immigrant entry cohort defined by citizenship status and for non-immigrants.

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[22] Households in which only the wife is an immigrant are excluded from the analysis as their inclusion may lead to double counting.

For the sake of brevity, however, we have decided not to present the *dollar* estimates of public transfers and services but to present only the *relative* estimates in Table 7. These data show the receipt of each important component of public transfer payments by a household headed by a naturalized citizen relative to those headed by a non-citizen. The most recent entry cohort in these data entered during 1990-94 since the 2000 census asked questions about household incomes pertaining to 1999 <u>and</u> citizenship rules in the United States require a minimum stay of five years by an immigrant.

As seen, the total receipts of public transfers and services by households headed by naturalized citizens remains lower than that of non-citizens in most entry cohorts although this gap narrows with length of stay. The most noticeable are the use of public welfare, unemployment compensation/workers' compensation, veteran's benefits and Medicaid, which are significantly lower for most entry cohorts of naturalized citizens at least until they have stayed for 40 years in the country. The receipts of social security and child support and Medicare are higher for most entry cohorts of households headed by naturalized citizens.

In sum, one may conclude from the above results that overall, households headed by naturalized citizens tend to be the recipients of lower transfer payments and public services at least until 20 years after arrival in the United States when compared with a household headed by a non-citizen. A clear emulation of households headed by non-citizens does not occur until after 35 years of residence in the country. However, receipts of some components of the public transfers emulate non-citizens faster.

We now turn to the overall balance of public transfers from an immigrant household to a non-immigrant household. For this purpose we consider the dollar values of the receipts of public transfers and services as well as the payment of taxes. Estimation of tax payments was conducted by applying a constant tax rate of 29.6 percent to average household incomes in each entry cohort as obtained from the census micro-data. The rationale for the 29.6 percent rate is discussed in the notes provided at the end of Table 8. The data are reported separately for households headed by naturalized citizens and non-citizens.

In the case of households headed by naturalized citizens, tax payments are below those of non-immigrants only for the most recent and oldest cohorts. However, none of the entry cohorts of households headed by non-citizens paid more taxes than households headed by non-immigrants. This result is consistent with the result reported earlier that naturalized citizens tend to have an income advantage over non-citizen immigrants.

On the other hand, receipts of public transfers and services by immigrant households headed by naturalized citizens begin to exceed those of non-immigrant households after they have remained in the United States for 25 years. Immigrant households whose head is a non-citizen are seen to consume transfer payments and public service in excess of non-immigrants after 10 years of stay in the country.

To sum up, the data on usage of public funds indicate that immigrant households headed by naturalized citizens tend to consume fewer public services than non-immigrants until after 25 years of the head's arrival into the country, while in the case of households headed by non-citizens this catch-up occurs only within 10 years of arrival.

Finally, to obtain the net public fund transfers from an average immigrant to a non-immigrant household, we add up the above results in column 3 of Table 8. These estimates may be viewed as conservative estimates since no account of increased provision for public good has been made. [23]

It is observed in Table 8 that most entry cohorts of immigrant households headed by naturalized citizens remain sources of public fund transfers for non-immigrants until at least the 40th year of arrival in the country. On the other hand, a household headed by non-naturalized immigrant remains a net recipient of public fund transfers from non-immigrants starting from early years of stay.

In sum, the above results indicate that there is a benefit to American taxpayers with the acquisition of citizenship by immigrants. The importance of distinguishing between the categories of immigrant classes in any research evaluating the economic performance of immigrants is also highlighted in these results.

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[23] By virtue of their presence, immigrants increase the provision of such public goods as national defence, research and development, policing, etc. without affecting the level of their use. Hence, an immigrant household reduces the tax payment of a non-immigrant household, and this tax saving should also be included in net transfer calculations.

Year of entry	Unemployment/ worker's compensation, veteran's benefits	Welfare (Public Assistance)	Supplemental security income	Child support	Food stamps	Social security	Medicare*	Medicaid*	Total health care	Schooling costs for elementary/ secondary Students	Total of public transfers/ services
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1990-94	1.06	0.23	2.72	1.46	0.71	1.26	2.72	0.76	0.94	0.84	0.93
1986-89	0.68	0.02	3.06	0.44	0.45	0.45	1.33	0.65	0.73	0.90	0.85
1980-85	0.61	0.00	0.87	1.64	0.15	1.08	1.89	0.45	0.61	0.78	0.74
1975-79	0.78	1.26	1.23	1.45	2.14	1.89	1.67	0.76	0.95	0.97	1.06
1970-74	0.86	0.26	0.75	1.73	0.41	2.02	2.14	0.62	0.91	0.81	0.94
1965-69	0.71	0.06	1.06	1.58	0.43	2.09	2.42	0.57	1.17	0.63	0.99
1960-64	0.66	0.66	0.76	0.29	0.33	2.03	2.25	0.55	1.17	0.57	1.01
Before 1960	1.34	1.00	0.44	0.55	0.40	1.46	1.33	0.44	1.05	0.50	1.16

Table 7: Receipts of transfer payments by households headed by naturalized citizens relative to those headed by non-citizens, United States, 1999*.

* A value greater than 1 means the dollar value received by a household headed by a naturalized citizen exceeded that received by a household headed by non-naturalized citizen.

Source: i.   Columns (1) through (6), computations were based on dollar values obtained from the 2000 U.S. population census micro-data.
ii.   For columns (7) and (8), number of persons covered per household (2000 U.S. population census micro-data) was multiplied by the respective per capita values, $775 and $730, which in turn were computed based on data provided by Centers for Medicare and Medicaid (2005a, 2005b) according to which national per capita health care expenditures in 2000 were $4,560, divided into Medicare and Medicaid (including Children's Health Care Program) as 17 and 16 percent, respectively.
iii.   For column (10), number of children aged 6-18 per household (2000 U.S. population census micro-data) were multiplied by per pupil cost of $6,911 (National Center for Education Statistics, 2001).

Table 8: Balance of public transfers and services from an immigrant household (by citizenship status) to a non-immigrant household, United States, 1999.*								
Year of entry	Dollar difference in taxes paid by immigrant and non-immigrant households (1)			Dollar difference in public services & transfers received by immigrant and non-immigrant households (2)			Net transfer from immigrant to non-immigrant household ($)** (1) + (2)	
	Head is naturalized citizen		Head is non citizen	Head is naturalized citizen		Head is non citizen	Head is naturalized citizen***	Head is non citizen***
1990-94	-1392		-3735	727		95	-665	-3640
1986-89	324		-3692	282		-1251	606	-4943
1980-85	4162		-4122	877		-1872	5039	-5994
1975-79	1078		-1052	-1328		-721	-250	-1773
1970-74	2612		-2043	-745		-1315	1867	-3358
1965-69	1889		-902	-1169		-1277	720	-2179
1960-64	1825		-483	-733		-640	1092	-1123
Before 1960	-3074		-2674	-4647		-2823	-7721	-5497

*In 1999, an average non-immigrant household received $8769 in public transfers and services and paid $16,603 in all taxes. **Contribution towards provision of public goods is ignored. ***A positive number means a transfer of funds from an immigrant to a non-immigrant household, while a negative number means the reverse is true.

Source: i. For tax calculations: According to OECD (2005) government tax revenue as percentage of GDP was 29.9 percent in 2000 which we assumed to also hold for 1999. This percentage was applied to average household income in each cohort, obtained from the 2000 U.S. population census micro-data. In the OECD classification, taxes are classified by the base of the tax: income and profits, payroll, property, consumption and other taxes. Social security contributions paid to general government revenue are also classified as taxes.

ii. For calculations of dollar values of public transfer and services received, please see notes at the end of Table 7.

IV. Discusssion and Conclusions

Naturalized citizens form the most legally advantaged group of immigrants in the United States. Yet, as noted by Bloemraad (2006), only about 40 percent of immigrants reported in the 2000 U.S. census were naturalized citizens. Results of the present study indicate that socio-economic characteristics play an important role in determining the probability to naturalize. Immigrants from less developed countries are more likely than those from developed countries to acquire United States citizenship and also reap the most economic gain. Home ownership, which is an indicator of wealth accumulation, increases the odds of acquiring citizenship status. However, the result that dual citizenship in country of origin reduces the odds of acquiring U.S. citizenship is puzzling. We attribute this result to a probable confusion in the understanding of dual citizenship laws of the United States.

All immigrants who obtain the United States citizenship earn higher labour market incomes because 1) they tend to possess greater human capital endowments and 2) they also enjoy greater rewards for their human capital investment than do the non-citizens. These rewards are higher for immigrants originating in developing countries, probably because prior to naturalization, their earnings are much lower than those of developed country immigrants. A possible explanation for this result may be that acquisition of citizenship by an immigrant is viewed by an employer as an indicator of a greater knowledge of local customs and traditions that is essential for a firm's success.

Acquisition of citizenship status by immigrants increases their contribution to the public coffers of the United Status. While previous literature has shown that naturalization increases welfare participation, the present study has shown that for a household headed by a naturalized citizen, the dollar values of public transfers remain below those received by a household headed by a non-citizen or a non-immigrant, for a long time after the head has arrived in the country. Citizenship acquisition also results in greater tax payments by an immigrant household. Thus, when we add up the transfer receipts and tax payments, a household headed by a naturalized citizen makes a positive treasury transfer between the tenth to the fortieth year in the United States.

In sum, the results of this study confirm the suggestion of Massey and Bartley (2005) that any analysis of immigrants' economic performance must pay attention to the legal status composition of immigrant population.

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