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### No Entiendo

THE EFFECTS OF BILINGUALISM ON HISPANIC EARNINGS

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## THE EFFECTS OF BILINGUALISM ON HISPANIC EARNINGS

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## **Abstract**

This paper examines the economic consequences of bilingualism. Specifically, we explore whether the ability to effectively communicate in English and Spanish is rewarded in labor markets. Using a sample of the Hispanic population drawn from U.S. census data for the year 2000 we find that controlling for education, gender, age, place of birth, sector and region of employment, bilingualism has a substantively small positive relation with higher income. However, our results also show that bilingualism is negatively correlated with wage-based income among different occupational categories and sectors, but particularly among managers and those employed in the public sector.

## | 1 | INTRODUCTION

This paper examines the economic consequences of bilingualism among Hispanics in the United States. Using census data for the year 2000 we explore whether the ability to effectively speak English and Spanish is rewarded in labor markets. In order to isolate the effect of bilingualism we focus our analysis on the Hispanic population of the U.S.. An earlier study by de la Garza et al. (2000), using a sample drawn from the 1990 Census, found a negative correlation between bilingualism and wages.<sup>1</sup> Given the recent growth of the Hispanic purchasing power and the process of economic integration with countries of the Western Hemisphere, we expected bilingualism to be rewarded in the market place at the turn of the Century. After controlling for education and other individual level characteristics such as age, gender, occupational category, economic sector of employment, region of residence and origin, we find that bilingualism, operationalized as the command of Spanish and the ability to speak English very well, is associated with higher income. The positive coefficient on bilingualism is, however, substantively small: On average the income level of bilingual Hispanics who speak Spanish at home and English very well,<sup>2</sup> is only 2.7 percentage points higher than the income of our baseline category: Hispanics that only speak English. We also find that income decreases monotonically as the ability to speak English falls, which is consistent with other findings in the literature on the effect of English proficiency on income, discussed in section 3 of the paper.<sup>3</sup>

Although the aggregate effect of bilingualism in the whole sample is positive, albeit small, we find evidence that suggests that bilingualism is penalized in some segments of the labor market. In manufacturing, for instance, we find a positive correlation between bilingualism and income among non-supervisory laborers; yet the correlation becomes negative among those in managerial positions. Moreover, in the public sector, where we would assume that the ability to speak both Spanish and English would be especially valuable, bilingualism is correlated with lower income in both supervisory and non-supervisory categories.

These findings are troubling for two reasons. First, the difference in earnings could be the consequence of discrimination in labor markets. Alternatively, it could be the case that

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<sup>1</sup> These results are confirmed by Fry & Lowell's (2003) analysis using data from the 1992 National Adult Literacy Survey commissioned by the U.S. Department of Education. Fry & Lowell find that once nativity, educational attainment, or residency are controlled for, second language skills have no effect on wages. They argue that labor markets neither value foreign language fluency, nor provide clear incentives for its acquisition (Fry & Lowell, 2003, pp. 138). Those incentives could have arisen in recent years given the changes in the composition of the U.S. population, in the domestic front, and economic integration with Latin America, in the international front.

<sup>2</sup> The census codes regarding English ability do not differentiate between the English language ability of monolinguals who speak only English and bilinguals who speak English very well. Consequently, these codes erroneously imply that bilinguals, including the native born who received all their education in the United States, have lower language skill than English monolinguals. There is no way to recode the data to correct for this inaccuracy. Nonetheless, we would argue that knowing a second language as well as being a native English speaker adds to an individual's economically valuable skills, and therefore it is not surprising that bilinguals who speak English very well would earn more than English monolinguals. Indeed, as we will argue, the surprise is that such a skill is so poorly rewarded.

<sup>3</sup> As reported in section 3 we also find that individuals that speak Spanish at home and speak English well are associated with earnings that are 1.6 percentage points lower than the baseline category; income is 9.9 percentage points lower for those that speak English not well, and 20.0 percentage points lower for those who do not speak English at all.

bilingualism is correlated with uneven access to quality education or with a lack of skill formation opportunities that limit Spanish-speaking Hispanics, even those proficient in English, to lower status less lucrative jobs and lower salaries in higher status positions.

Our first set of findings, namely that on average Hispanics that speak English very well and speak Spanish at home earn only slightly more than those who speak only English, is minimally consistent with recent Hispanic demographic and economic trends. Latinos now constitute the largest minority in the United States, and their purchasing power is growing at triple the rate of the overall US population. Their spending power in 2003 was \$653 million, a sum that is expected to reach more than \$1 trillion in 2008. (Franco 2004). Further adding to their growing economic clout is the role they may play regarding trade and investment in Mexico and Spanish-speaking Latin America in general.<sup>4</sup>

Our results also show that not speaking English negatively affects earnings, corroborating the argument that English fluency is rewarded in the marketplace. These results are consistent with a key finding in the empirical literature on Latino earnings and socioeconomic achievements.<sup>5</sup> English is the dominant language in US labor markets, and English proficiency is a key determinant of the success in labor markets.<sup>6</sup> This explains why individuals with limited command of English (Spanish monolinguals and those who speak English poorly) are likely to earn systematically less in all employment sectors and occupational categories.<sup>7</sup> High English proficiency is also associated with high levels of socialization regarding mainstream culture and labor market practices in the United States, which might differ from those in the country of origin of the worker. In other words, the lack of familiarity with mainstream sociocultural including work style could easily lead to lower wages.

Our second set results uncover a negative correlation between bilingualism and income in different occupational categories and industries. These findings cast doubt on a common belief that speaking a second language is a valuable skill. We see no clear economic argument explaining why English and Spanish fluency would diminish an individuals' market value. Even if speaking Spanish per-se were not valued in labor markets, why would *bilingualism* – the ability to speak English well *and* Spanish- be associated with lower wages? To the extent that Latinos are bilingual and speak English fluently and therefore are able to move across

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<sup>4</sup> Between 1992 and 2003, Latin America was the fastest growing US regional trade partner. Total US merchandise trade with Latin America grew by 154% during that period, compared to 88% for Asia, 89% for the EU, 78% for Africa, and 102% for the world. Mexico was accountable for most of US trade growth with Latin America from 1992 to 2003, as the largest and fastest growing trade partner in that region. By 2003, furthermore, Mexico accounted for two-thirds of the region's trade with the US, and 11.9% of total world trade with the US (Hornbeck, 2004, p. 1-3). On a historical-cost basis, from 1990 to 2000, US direct investment in Latin America increased 265%. (Bureau of Economic Analysis, 2006). The economic trends are reaffirmed by intergovernmental initiatives: the US has signed and enacted bilateral investment treaties (BITs) with the following Latin American countries (the year of signing is in parentheses): Argentina (1991), Bolivia (1998), Ecuador (1993), El Salvador (1999 but pending implementation), Honduras (1995), Nicaragua (1995, pending implementation), Panama (1982, amended in 2000), and most recently Uruguay (2005, pending implementation) (US Department of State, 2006).

<sup>5</sup> See, inter alia, Grenier 1984; McManus, Gould, and Welch 1983; Tainer 1988; Tienda and Neidert 1984; Chiswick & Miller 2002

<sup>6</sup> For those arriving in the U.S. becoming proficient in English is equivalent to acquiring a market-valued skill or human capital, and is likely to be reflected in higher incomes. See footnote 5.

<sup>7</sup> The hypotheses that English proficiency is valued, and that Hispanics that who only speak Spanish earn lower incomes, was verified by de la Garza et al. (2000) in the 1990 census data. The results are confirmed in our analysis of individual data for the year 2000, which we discuss in more detail in section 3.

labor markets, we should expect them to earn at least as much as those who only speak English. If the pay is lower in jobs where speaking Spanish is a precondition for being hired,, those individuals who also speak English *very well* should be able to move to more rewarding jobs that demand a good command of English. Additionally, bilinguals should have higher incomes if they hold jobs for which English monolinguals are unqualified such as those dealing with Hispanic local and international markets or supervising Spanish dominant staff as is often true in the construction industry and large segments of the service sector. However, the negative association between bilingualism and income in managerial and supervisory positions in manufacturing suggests that there are restrictions to the ability of bilingual individuals to move across labor markets and up the income ladder. In other words, unless bilingualism is associated with restrictions to sectoral or regional mobility that force Spanish speaking Hispanics to remain attached to lower paying jobs, bilinguals would seek to raise their wages by seeking new employment.

In the following section we discuss two plausible explanations for these findings. Both argue that the patterns we have described reflect discrimination. The first suggests that Spanish speakers experience explicit discrimination, while the second emphasizes institutional practices that prevent Latinos from gaining equal access to quality education which results in lower wages.

## | 2 | LANGUAGE PROFICIENCY, BILINGUALISM AND EARNINGS

**A**s discussed in the introduction, this paper tries to answer the following question: Is bilingualism rewarded in US labor markets? Or put differently, is the ability to speak English and Spanish fluently associated with higher earnings?

Several studies have looked at the relationship between language proficiency and income. Chiswick (1978) and Mincer (1974), among others, have shown that English proficiency is correlated with human capital and education, and educational attainment is key in explaining earnings.<sup>8</sup> Using U.S. Census data from 1980, Chiswick & Miller (1992) estimate that among foreign men the gap in earnings between those that were proficient English and those that were not was roughly 17%. Fluency in the local language has also been shown to have a positive effect on wages in studies conducted in Canada and Australia (Chiswick & Miller 1995), and Israel (Chiswick 1998; Chiswick and Repetto 2001).

It has also been shown that English proficiency and assimilation leads to a narrowing of the immigrant-native earnings gap over time.<sup>9</sup> Upon arrival immigrants learn English and have high rates of participation in schooling, which allows them to assimilate into the U.S. labor markets. Yet, an overwhelming majority of those who arrive as adults without a high school diploma will never earn as much as the average native (Duleep & Regets 2002; Card 2005). There are several reasons for the persistence of this gap. Among them, those who do not speak English are subject to additional competition from an ever-increasing pool of migrants arriving in the country. The influx of immigrants has expanded the supply of less skilled workers, exerting downward pressure on the income of those Hispanics who only speak Spanish or who know some English but are Spanish dominant.<sup>10</sup>

In the case of Spanish speakers in the U.S., their lower earnings are likely to be linked to reduced sectoral and regional mobility, and to the effect of migration into the United States, which has increased considerably since the 1970s, and dramatically in the past fifteen years. In recent years a larger proportion of immigrants arriving in the U.S. is less skilled than the average American. This is reflected in their lower level of education attainment: one third of high-school dropouts in the U.S. are foreign born.<sup>11</sup> Hispanics who are not fully proficient in English tend to have similar educational attainment levels and skills as other migrants do, and are hence more likely to compete with them for jobs.

Card (2005) shows that “while immigrants comprised only 13% of the working age population in 2000, they made up 28% of the population with less than a high school diploma, and over half of all those with less than 8 years of schooling” (Card 2005, 302). Camarota and Krikorian (1999, pp. 157) document that in the 1990s immigrants tend to disproportionately concentrate in bottom fifth of the labor market. Given that education attainment of immigrants is directly linked to attainment in their country of origin, immigrants coming from Spanish-speaking Latin America have lower average years of

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<sup>8</sup> These studies show that variation of income across individuals in the U.S. immigrant labor market can be explained by schooling and labor market experience. See Chiswick & Miller (2002, pp. 33).

<sup>9</sup> See Chiswick (1978); Chiswick & Miller (2002); Card (2005). Lubotsky (2000), on the other hand, acknowledges that while earnings of immigrants tend to improve over time (about 10-15% over twenty years) this improvement is not enough to offset the original difference in earnings with natives (roughly 35-40%).

<sup>10</sup> Borjas, Freeman and Katz (1997) find that between one fourth and one-half of the drop in relative wages of low skilled workers can be accounted for by immigration; see Blanchflower & Slaughter (1999), pp. 81.

<sup>11</sup> Camarota and Krikoria (1999); Bean, Brown and Rumbaut (2006)

schooling than natives (Card 2005, pp. 301).<sup>12</sup> The picture is slightly different at the upper end of income and education distributions, where immigrants are more likely to have an advanced degree (Card 2005, pp. 301).

In principle, bilingualism makes individuals mobile across labor markets. They may either take a job where speaking Spanish is a required part of the job, where it is an advantage, or any other job where Spanish is not required. Unlike English monolinguals, they are not constrained to take jobs in one job market. To the extent that bilingualism is associated with sectoral labor mobility its effect on income should be neutral at a minimum. If speaking a second language is an essential skill or advantageous, then it should be rewarded.<sup>13</sup>

In light of the preceding discussion, and following de la Garza et al. (2000) we posit three hypotheses.

**Hypothesis 1: bilingualism has a positive affect on income.**

Alternatively, it is possible that there is no reward to being bilingual; i.e., that speaking English and Spanish is not particularly rewarded in labor markets, or that speaking Spanish is only valuable in lower paying activities. In this case there should be no relationship between bilingualism and income. However, bilingual individuals should earn no less than monolingual English speakers, since bilingual individuals have the potential to move from the low paying jobs/activities where Spanish is required, to higher paying jobs where speaking English fluently is. This leads to our second hypothesis:

**Hypothesis 2: There is no relationship between bilingualism and income.**

Hispanics who are Spanish monolinguals or Spanish dominant differ from those who are English dominant in key ways. Most significantly, their educational attainment and related skill levels are lower than that of their English-dominant counterparts, and these skill differentials are likely to affect earnings in two ways: less skills make individuals less productive and also reduces their ability to move across sectors in search for higher paying jobs.<sup>14</sup> Hence individuals who speak Spanish only, or who are not fully proficient in English should be associated with lower earnings, leading to the following hypothesis:

**Hypothesis 2b: There is a positive correlation between ability to speak English and earnings.**

Last, it is possible that speaking Spanish is penalized in labor markets. Employers may require employees to speak only English and thus may refuse to hire Spanish dominant Hispanics. Also, Hispanics tend to cluster in areas of the country where they face competition from the large pool of migrants with similar skills who continuously flow into the country. The tendency for Hispanic immigrants to concentrate in historically established communities or in new communities established by new immigrants and the

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<sup>12</sup> Additionally, the education in immigrant sending countries is likely to be of lower quality than education in the U.S. (see Card 2005, pp. 316; Bratsberg & Terrell 2002).

<sup>13</sup> This argument is eloquently presented by Carliner (1981), and is the basis of Fry & Lowell's (2003) analysis of the effects of bilingualism on wages using the 1992 National Adult Literacy Survey.

<sup>14</sup> Lack of skill is associated with depressed income, and the inability to move to more rewarding jobs.



social networks they create such as those recently developed in Georgia and North Carolina (TRPI 200-) reduces the incentives to move across the country in search of more rewarding opportunities. These patterns suggest our third hypothesis:

**Hypothesis 3: there is a negative correlation between speaking Spanish and income.**

There is reason to believe that the relationship between language abilities and income could vary across sectors and labor markets depending on the combination of workers' skills demanded. To test this, we further break down our sample into different sectors of the economy.

### | 3 | EMPIRICS

To evaluate these hypotheses we conduct a series of statistical tests using the United States 2000 Census five-per-cent Public Use Microdata Sample (PUMS). The five-per-cent PUMS is a random sample containing individual records of the characteristics for a 5 percent of the people in the 2000 U.S. Census data (roughly 14,000,000 million observations). PUMS contains individual weights for each person to ensure that no group in the Census sample is over-sampled.<sup>15</sup>

In order to test the main hypotheses stated above, we estimate the following model:

$$\log(y_i) = \beta_0 + \beta_j X_{ji} + \gamma_k Z_{ki} + \varepsilon_i$$

where  $\log(y_i)$  is the natural logarithm of wages and income salary for individual  $i$ .  $X_{ji}$  is a series of indicator variables measuring an individual's language ability, while  $Z_{ki}$  represents a matrix of educational, sociodemographic, occupational, and regional controls.

The sample is limited to Hispanics<sup>16</sup> between 18 and 64, the group most likely to be in the labor force, and we exclude those who had no wage or salary income in 1999. Limiting the sample to Latinos allows us to focus on the effects of language without having to deal with the effects of racial and ethnic discrimination that would be present if we included non-Hispanic whites and African Americans in the analysis.

The analysis controls for the effects of education using a series of indicator variables to account for different levels of educational attainment<sup>17</sup>: No school - 1st-4th grade, 5th-8th grade, 9th grade, 10th grade, 11th grade, 12th grade no diploma, high school graduate, some college, associate degree, bachelors, masters, professional, and doctorate. We also control for gender (female), age and age squared, citizenship status (whether the individual is a U.S. citizen), sector of employment (Agriculture, mining and construction; manufacturing; service and public sector), occupation (Management, professional, and related occupations; service occupations; sales and office occupations; farming, fishery, and forestry occupations; constructions, extraction, and maintenance occupations; and production, transportation, and material moving occupations), and geographic region of residence (Northeast, Midwest, West, and South). The latter is essential because of wage differences across geographically dispersed labor markets and because of the clustering patterns that characterize Latino settlements. We classify individual into five different categories according to their self-reported language ability (see Table 1 for descriptive statistics):

- Spanish monolingual
- Spanish is spoken at home and respondent speaks English not very well
- Spanish is spoken at home and respondent speaks English well
- Spanish is spoken at home and respondent speaks English very well

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<sup>15</sup> When applied to individual records the weights can be used to expand the sample to the total population in the Census. See U.S. Census Bureau (2003). Census 2000, Public Use Microdata Sample, (PUMS), United States, Technical Documentation. Washington, DC: U.S. Census Bureau, 2003

<sup>16</sup> In this paper we use the terms Hispanic and Latino interchangeably to refer to persons in the United States who can trace their origin to the Spanish countries. According to the U.S. Census, origin is ancestry, lineage, heritage, nationality group, or country of birth. People of Hispanic origin may be of any race.

<sup>17</sup> No school and 1<sup>st</sup> to 4<sup>th</sup> grade is the baseline category.

- English monolingual.<sup>18</sup>

Table 1. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.
Income and Wages	15,152,667	22,849.550	25,897.440
English at home & Only English	15,152,667	0.196	0.397
Spanish at home & English very well	15,152,667	0.386	0.487
Spanish at home & English well	15,152,667	0.171	0.377
Spanish at home & English not well	15,152,667	0.162	0.369
Spanish at home & no English	15,152,667	0.084	0.278
No Schooling	15,152,667	0.042	0.200
1st-4th grade	15,152,667	0.025	0.157
5th-8th grade	15,152,667	0.134	0.341
HS No Diploma	15,152,667	0.204	0.403
High school graduate, or GED	15,152,667	0.245	0.430
Some college, no degree	15,152,667	0.197	0.398
Associate degree, occupational program	15,152,667	0.047	0.212
Bachelors degree	15,152,667	0.071	0.256
Master's, Professional and Doctorate	15,152,667	0.035	0.184
Female	15,152,667	0.580	0.493
Age	15,152,667	3.473	1.113
Age squared	15,152,667	1,329.972	845.851
Native Born	15,152,667	0.466	0.499
Northeast	15,152,667	0.147	0.354
South	15,152,667	0.336	0.472
West	15,152,667	0.423	0.494
Midwest	15,152,667	0.094	0.291
Management, Professional and Related Occupations	15,152,667	0.171	0.376
Service occupations	15,152,667	0.206	0.405
Sales & office occupations	15,152,667	0.231	0.422
Farming, fishing and forestry	15,152,667	0.030	0.172
Construction, extraction and maintenance occupations	15,152,667	0.131	0.338
Production, transportation and material moving occupations	15,152,667	0.227	0.419

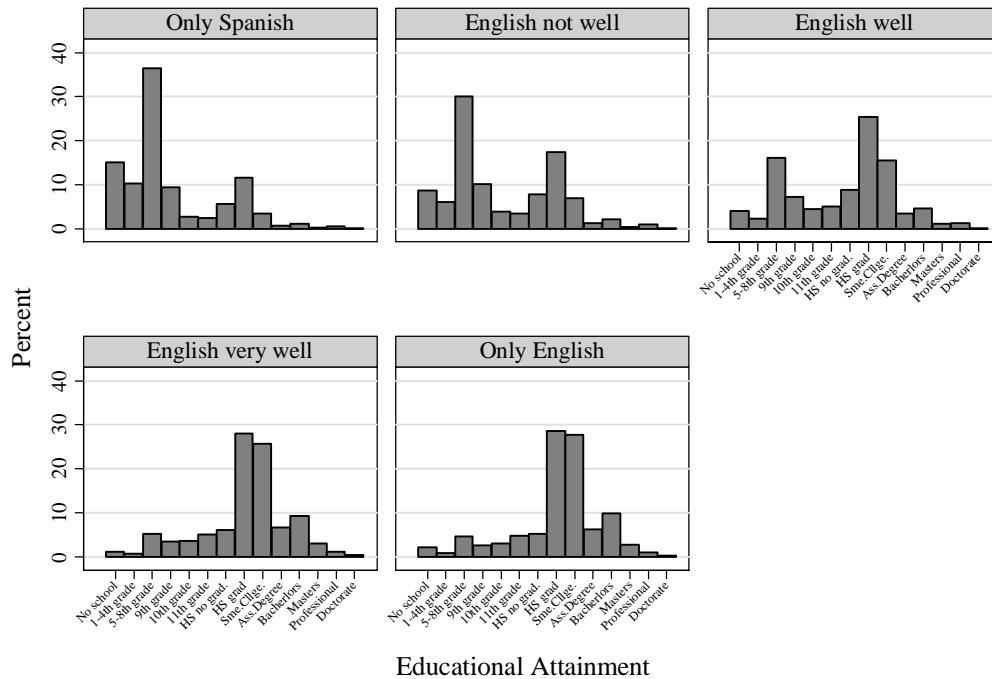
As mentioned previously, we face a problem defining bilingualism: The 2000 Census identifies individuals that speak Spanish at home and provides a measure English proficiency based on self-reporting. We created a scale combining the two to define bilingualism. Note that the highest level of English ability for those who speak Spanish at home is “speaks English very well.” This seems to suggest that the English abilities of those individuals who describe themselves in this way is lower than that of English monolinguals. However, many native born bilingual Latinos are as fluent in English as are Hispanic English monolinguals. Consequently, our measure of bilingualism could be understating the English abilities of bilinguals.

Another problem in the empirical strategy is that we cannot control for quality of education, and levels of assimilation/acculturation, which are likely to affect earnings. The history of the

<sup>18</sup> We create indicator variables for each category. English monolingual serves as the baseline or omitted category in the statistical analyses.

relationship of Latinos to educational institutions from primary school through college strongly suggests that even if they have the same amount of education as non-Hispanic whites, Latinos do not receive the same quality of education. Their schools are more likely to be overcrowded and to offer enrichment programs; and their parents are less prepared to assist with homework and provide assistance in the form of books and computers. Lacking data on such characteristics makes it difficult to determine the validity of the educational data gathered by the census. Nonetheless, years of school are suggestive of educational attainment, and is the best data available to us. Figure 1 shows the distribution of education by English ability. A general pattern that arises from Figure 1 is that Spanish monolinguals and those bilinguals who speak little English, tend to have less years of schooling (5th-8th grade and 9th grade respectively) than those English monolinguals and bilinguals who speak English well or very well who are high school graduates. Individuals classified as English monolinguals and those that speak Spanish and English well or very well show roughly similar educational attainment levels.

Figure 1. Education by English Ability

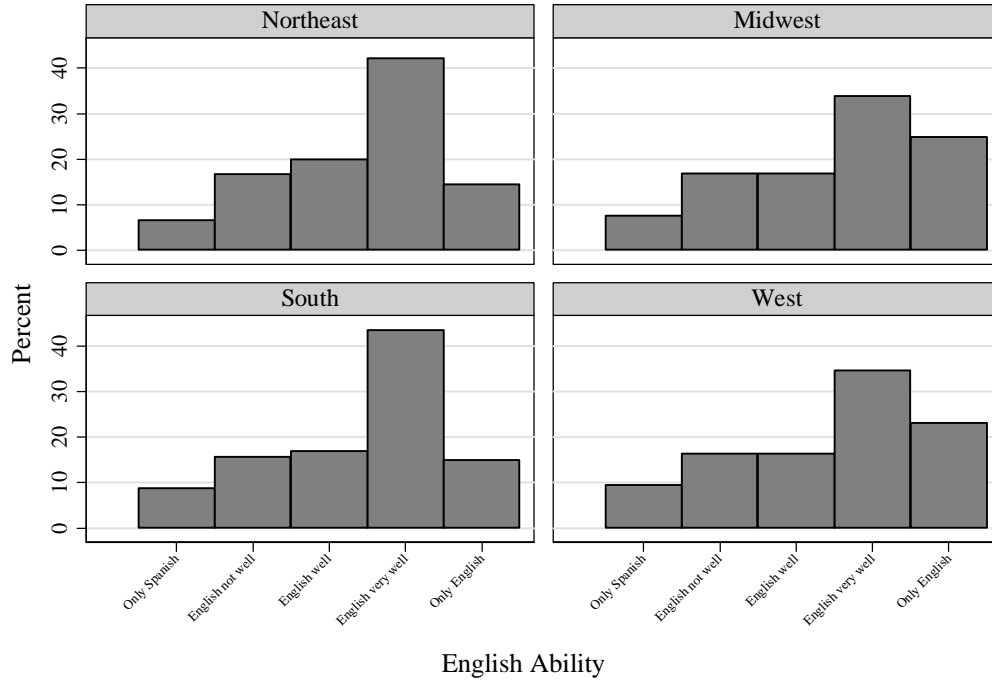


Source: IPUMS 5% 2000

Even though the Hispanic population tends to be clustered in specific geographic areas, their English ability seems not to vary substantially by region (see Figure 2). In all four regions the plurality tends to speak English very well while less than 10% are Spanish monolinguals.

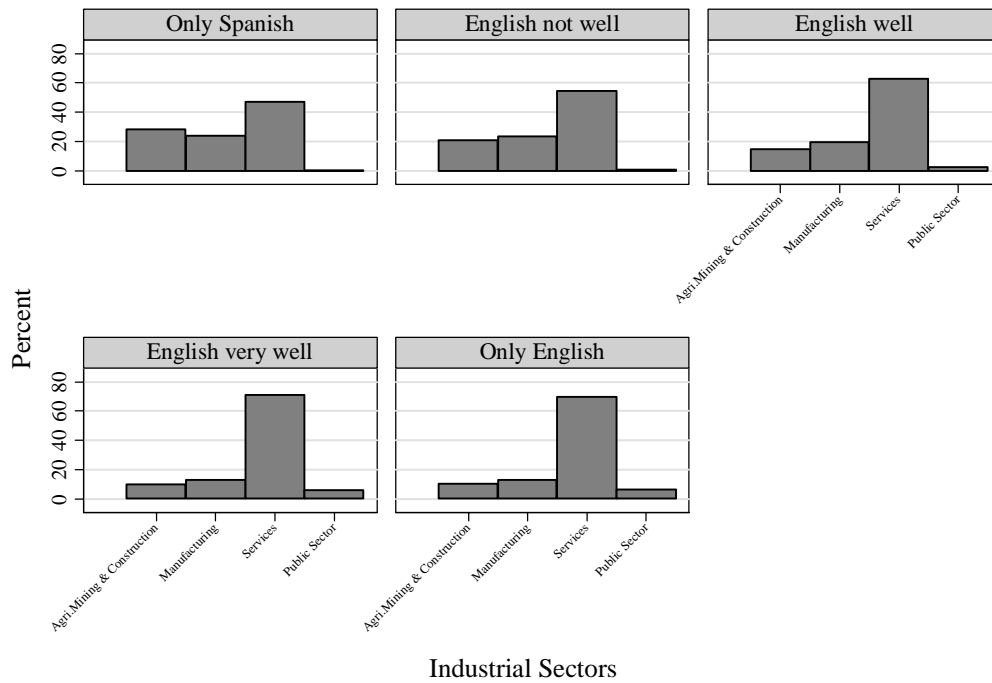
In terms of sector and occupation, Spanish monolinguals and those who speak little English tend to work in greater proportions in the agricultural, construction, and manufacturing. However, regardless of their English ability, most Latinos work in the service industry (See Figure 3).

Figure 2. English Ability by Census Regions



Source: IPUMS 5% 2000

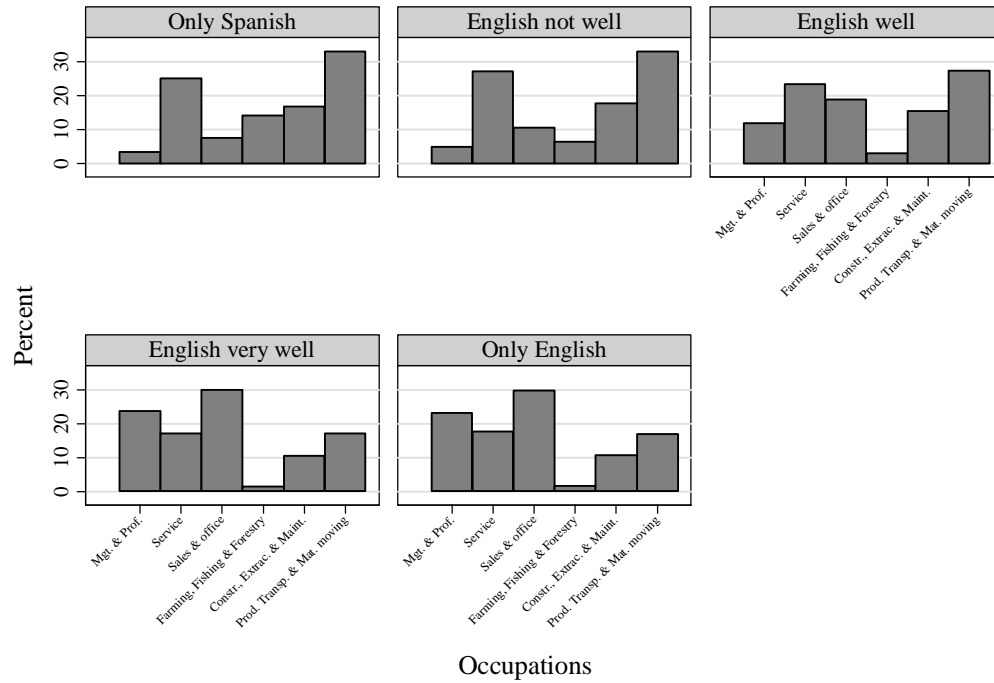
Figure 3. Industrial Sectors by English Ability



Source: IPUMS 5% 2000

The type of occupation also varies by English ability. For instance, bilingual Latinos who speak English well and very well are in managerial, professional, service, and sales & office occupations while Spanish monolinguals and those who do not speak English well are in construction, production, and transportation occupations (see Figure 4).

**Figure 4. Professional Occupations by English Ability**



Source: IPUMS 5% 2000

## | 4 | RESULTS

Our dependent variable is wage-based income. Transforming the value of income as provided by PUMS into its natural log of income allows us to interpret the coefficients obtained as semi-elasticities: The coefficient on the categorical independent variables (difference in group means) multiplied by one hundred, is approximately equal to a percent change in the dependent variable. Table 2 illustrates the average income for each of our 5 categories of English ability. The trend is clear: the better the command of English the higher the average income.

**Table 2. Wage and Salary Income by Language Ability  
2000**

<b>Group</b>	<b>Weighted Observations</b>	<b>Mean \$USD</b>	<b>Std. Dev.</b>
Spanish Only	1,277,846	14,747	19,710
English not well	2,455,975	17,894	20,917
English well	2,591,938	22,296	23,550
English very well	5,856,429	25,426	27,858
Only English	2,970,479	25,836	28,417

Source: IPUMS 5% 2000

Table 3 shows that on average the income level of bilingual Hispanics, those that speak Spanish at home and English very well, is only 2.7 percentage points higher than the income of those Hispanics who only speak English after accounting for educational attainment, gender, age, origin, sector, region of employment and occupation. Income decreases monotonically as the ability to speak English falls: the income of those who speak Spanish at home and English well, on the other hand, is 1.6 percentage points lower than the baseline category (English monolinguals), 9.9 percentage points lower for those that speak English not well, and 20.0 percentage points lower for those who do not speak English at all.

**Table 3. Multiple Regression Analysis: log of income and wages on socio-demographic, educational, regional, and occupation  
Baseline Model**

Log (Income and Wages)	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]
Spanish at home & English very well	0.027	0.001	42.5**	0	0.026 0.029
Spanish at home & English well	-0.016	0.001	-19.8**	0	-0.018 -0.014
Spanish at home & English not well	-0.099	0.001	-109.9**	0	-0.101 -0.097
Spanish at home & no English	-0.200	0.001	-179.66**	0	-0.202 -0.197
5th-8th grade	0.069	0.001	63.53**	0	0.067 0.071
HS No Diploma	0.051	0.001	48.13**	0	0.049 0.053
High school graduate, or GED	0.225	0.001	209.85**	0	0.223 0.228
Some college, no degree	0.300	0.001	264.82**	0	0.298 0.302
Associate degree, occupational program	0.418	0.001	284.11**	0	0.415 0.421
Bachelors degree	0.560	0.001	407.26**	0	0.557 0.562
Master's, Professional and Doctorate	0.655	0.002	399.47**	0	0.652 0.658
Female	-0.447	0.001	-879.47**	0	-0.448 -0.446
Age	1.309	0.001	996.09**	0	1.307 1.312
Age squared	-0.001	0.000	-833.89**	0	-0.001 -0.001
U.S. Citizen	0.042	0.001	69.78**	0	0.041 0.043
Northeast	-0.047	0.001	-48.89**	0	-0.049 -0.045
South	-0.120	0.001	-140.33**	0	-0.122 -0.118
West	-0.063	0.001	-76.01**	0	-0.065 -0.062
Management, Professional and Related Occupations	0.097	0.004	23.35**	0	0.089 0.106
Service occupations	-0.370	0.004	-88.73**	0	-0.378 -0.362
Sales & office occupations	-0.137	0.004	-33.05**	0	-0.146 -0.129
Farming, fishing and forestry	-0.487	0.004	-111.73**	0	-0.495 -0.478
Construction, extraction and maintenance occupations	-0.065	0.004	-15.57**	0	-0.073 -0.057
Production, transportation and material moving occupations	-0.158	0.004	-37.97**	0	-0.166 -0.150
Constant	7.183	0.005	1472.26**	0	7.173 7.192

Number of observations = 15,152,667; F( 24,15152642) = . ; Prob > F = 0; Adj. R2 = .2392; Root MSE = .89257;

\* significant at 5%; \*\* significant at 1%

Tables 4 through 10 report results by sectors. In agriculture, mining and construction bilingualism is associated with higher income: those that speak Spanish and English very well earn on average 4.0 percentage points more than those in the baseline category; those that speak Spanish and English well are associated with 5.4 percentage points more in income. The difference between those who speak English very well and well may be because the former may be overqualified given the characteristics of this particular sector. The sign turns negative for those that speak Spanish and English not well or not at all: -3.0 and -16.2 percentage points lower than those who only speak English (see Table 4).



Table 4. Multiple Regression Analysis: log of income and wages on socio-demographic, educational, regional for the Agricultural, Mining and Construction Sector

Log (Income and Wages)	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
Spanish at home & English very well	0.040	0.002	20.97**	0	0.037	0.044
Spanish at home & English well	0.054	0.002	24.92**	0	0.050	0.058
Spanish at home & English not well	-0.030	0.002	-13.7**	0	-0.034	-0.026
Spanish at home & no English	-0.162	0.002	-66.53**	0	-0.167	-0.157
5th-8th grade	0.064	0.002	31.74**	0	0.060	0.068
HS No Diploma	0.065	0.002	31.11**	0	0.061	0.069
High school graduate, or GED	0.199	0.002	89.25**	0	0.195	0.203
Some college, no degree	0.284	0.003	106.96**	0	0.279	0.289
Associate degree, occupational program	0.400	0.005	88.12**	0	0.391	0.409
Bachelors degree	0.443	0.004	101.85**	0	0.435	0.452
Master's, Professional and Doctorate	0.391	0.007	59.48**	0	0.378	0.404
Female	-0.511	0.002	-231.9**	0	-0.515	-0.506
Age	0.888	0.004	253.69**	0	0.881	0.895
			-			
Age squared	-0.001	0.000	212.36**	0	-0.001	-0.001
U.S. Citizen	0.060	0.001	40.49**	0	0.057	0.063
Northeast	-0.115	0.003	-35.36**	0	-0.121	-0.108
South	-0.173	0.003	-68.76**	0	-0.178	-0.168
West	-0.083	0.003	-33.37**	0	-0.088	-0.079
Management, Professional and Related Occupations	0.365	0.044	8.2**	0	0.277	0.452
Service occupations	-0.308	0.045	-6.9**	0	-0.395	-0.220
Sales & office occupations	0.181	0.044	4.06**	0	0.094	0.268
Farming, fishing and forestry	-0.428	0.044	-9.63**	0	-0.515	-0.340
Construction, extraction and maintenance occupations	-0.014	0.044	-0.33	0.74	-0.101	0.073
Production, transportation and material moving occupations	0.011	0.044	0.24	0.81	-0.077	0.098
Constant	7.976	0.045	177.4**	0	7.888	8.064

Number of observations = 2,053,925; F( 24,2053900) =20437.10; Prob > F = 0; Adj. R2 = .1928; Root MSE = .83589;  
 \* significant at 5%; \*\* significant at 1%

In manufacturing the results differ with occupational categories. Among blue collar workers (defined as production occupations except supervisors) the coefficient is positive for those who speak English very well and well. They earn 3.2 and 6.2 percentage points higher income respectively than those in the base category (see Table 5).

**Table 5. Multiple Regression Analysis: log of income and wages on socio-demographic, educational, regional for the Manufacturing Sector Production Occupations (Except Supervisors)**

<b>Log (Income and Wages)</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>t</b>	<b>P&gt;t</b>	<b>[95% Conf. Interval]</b>	
Spanish at home & English very well	0.032	0.002	13.57**	0	0.028	0.037
Spanish at home & English well	0.062	0.002	25.01**	0	0.057	0.067
Spanish at home & English not well	-0.043	0.003	-17.36**	0	-0.048	-0.039
Spanish at home & no English	-0.158	0.003	-55.34**	0	-0.164	-0.153
5th-8th grade	0.060	0.002	24.48**	0	0.055	0.064
HS No Diploma	0.078	0.002	31.53**	0	0.073	0.083
High school graduate, or GED	0.211	0.003	82.61**	0	0.206	0.216
Some college, no degree	0.298	0.003	96.6**	0	0.292	0.304
Associate degree, occupational program	0.365	0.006	65.63**	0	0.354	0.376
Bachelors degree	0.185	0.006	31.02**	0	0.173	0.196
Master's, Professional and Doctorate	0.123	0.008	15.67**	0	0.107	0.138
Female	-0.468	0.001	-334.72**	0	-0.471	-0.466
Age	0.831	0.004	209.8**	0	0.824	0.839
Age squared	-0.001	0.000	-169.32**	0	-0.001	-0.001
U.S. Citizen	0.082	0.002	51.11**	0	0.079	0.085
Northeast	-0.191	0.002	-81.15**	0	-0.196	-0.187
South	-0.176	0.002	-85.36**	0	-0.180	-0.172
West	-0.135	0.002	-70.38**	0	-0.139	-0.132
Constant	7.985	0.008	1008.56**	0	7.969	8.000

Number of observations = 1,438,481; F( 18,1438462) = 15259.89 ; Prob > F = 0; Adj. R2 = .1603; Root MSE = .80684;  
 \* significant at 5%; \*\* significant at 1%

**Table 6. Multiple Regression Analysis: log of income and wages on socio-demographic, educational, regional for the Manufacturing Sector Managerial Occupations**

<b>Log (Income and Wages)</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>t</b>	<b>P&gt;t</b>	<b>[95% Conf. Interval]</b>	
Spanish at home & English very well	-0.057	0.003	-16.48**	0	-0.064	-0.050
Spanish at home & English well	-0.212	0.005	-42.82**	0	-0.221	-0.202
Spanish at home & English not well	-0.347	0.007	-49.71**	0	-0.361	-0.334
Spanish at home & no English	-0.435	0.011	-40.74**	0	-0.456	-0.414
5th-8th grade	0.024	0.012	1.96*	0.049	0.000	0.049
HS No Diploma	0.044	0.012	3.73**	0	0.021	0.066
High school graduate, or GED	0.143	0.011	12.65**	0	0.121	0.166
Some college, no degree	0.228	0.011	20.35**	0	0.206	0.250
Associate degree, occupational program	0.322	0.012	27.46**	0	0.299	0.345
Bachelors degree	0.564	0.011	50.12**	0	0.542	0.586
Master's, Professional and Doctorate	0.686	0.012	58.8**	0	0.663	0.709
Female	-0.281	0.003	-90.61**	0	-0.288	-0.275
Age	1.238	0.010	129.24**	0	1.219	1.257
Age squared	-0.001	0.000	-108.07**	0	-0.001	-0.001
U.S. Citizen	0.103	0.004	25.77**	0	0.095	0.111
Northeast	-0.014	0.006	-2.42**	0.016	-0.025	-0.003
South	-0.052	0.005	-10.71**	0	-0.062	-0.043
West	-0.017	0.005	-3.66**	0	-0.026	-0.008
Constant	7.569	0.022	343.15**	0	7.526	7.612

Number of observations = 232,350; F( 18,232331) = 5120.44; Prob > F = 0; Adj. R2 = .2840 Root MSE = .68686;  
 \* significant at 5%; \*\* significant at 1%

In the sub-sample of those in supervisory and managerial positions in manufacturing the coefficients for those who speak English very well and well turns negative: they are associated with -5.7 and -21.2 percentage points lower income than Hispanics who only speak English (see Table 6).

The results for the service sector suggest that the income of those who speak English very well and Spanish at home is roughly 3.1 percentage points higher than the income of those in the baseline category. Income decreases monotonically with poorer English proficiency: the coefficient is -0.025 for those who speak English well (roughly -3 percentage points), -0.104 for those who speak English not well, and -0.204 for those that don't speak English (-10 and -20 percentage points respectively) (see Table 7).

**Table 7. Multiple Regression Analysis: log of income and wages on socio-demographic, educational, regional for the Service Sector**

Log (Income and Wages)	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
Spanish at home & English very well	0.031	0.001	39.33**	0	0.030	0.033
Spanish at home & English well	-0.025	0.001	-23.89**	0	-0.027	-0.023
Spanish at home & English not well	-0.104	0.001	-87.27**	0	-0.106	-0.102
Spanish at home & no English	-0.204	0.002	131.78**	0	-0.207	-0.201
5th-8th grade	0.059	0.002	37.17**	0	0.056	0.063
HS No Diploma	0.024	0.002	15.6**	0	0.021	0.027
High school graduate, or GED	0.210	0.002	138.18**	0	0.207	0.213
Some college, no degree	0.265	0.002	168.15**	0	0.262	0.268
Associate degree, occupational program	0.380	0.002	195.66**	0	0.376	0.384
Bachelors degree	0.534	0.002	292.38**	0	0.530	0.537
Master's, Professional and Doctorate	0.656	0.002	314.28**	0	0.652	0.660
Female	-0.429	0.001	683.24**	0	-0.430	-0.428
Age	1.415	0.002	851.7**	0	1.412	1.418
Age squared	-0.002	0.000	714.58**	0	-0.002	-0.002
U.S. Citizen	0.015	0.001	19.7**	0	0.014	0.017
Northeast	0.018	0.001	14.29**	0	0.015	0.020
South	-0.077	0.001	-66.9**	0	-0.079	-0.074
West	-0.024	0.001	-21.89**	0	-0.027	-0.022
Management, Professional and Related Occupations	0.060	0.022	2.76**	0.00	0.017	0.102
Service occupations	-0.398	0.022	-18.41**	0	-0.440	-0.355
Sales & office occupations	-0.147	0.022	-6.83**	0	-0.190	-0.105
Farming, fishing and forestry	-0.464	0.022	-21.2**	0	-0.507	-0.421
Construction, extraction and maintenance occupations	-0.070	0.022	-3.25**	0.00	-0.113	-0.028
Production, transportation and material moving occupations	-0.217	0.022	-10.06**	0	-0.260	-0.175
Constant	6.962	0.022	318.4**	0	6.919	7.004

Number of observations =9,905,607; F( 24,9905582) = . ; Prob > F = 0; Adj. R2 = .2440 Root MSE = .92578

\* significant at 5%; \*\* significant at 1%

In the public sector the results are negative for all categories: when compared with the baseline category those who speak Spanish and English very well earn 2.8 percentage points

less; those who speak English well, not well and not at all earn 10.8, 22.1 and 23.6 percentage points less than those who only speak English.

**Table 8. Multiple Regression Analysis: log of income and wages on socio-demographic, educational, regional for the Public Sector**

Log (Income and Wages)	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
Spanish at home & English very well	-0.028	0.002	-13.18**	0	-0.033	-0.024
Spanish at home & English well	-0.108	0.003	-31.55**	0	-0.115	-0.102
Spanish at home & English not well	-0.221	0.006	-38.75**	0	-0.232	-0.209
Spanish at home & no English	-0.236	0.010	-23.53**	0	-0.256	-0.216
5th-8th grade	-0.120	0.012	-10.14**	0	-0.143	-0.096
HS No Diploma	0.055	0.011	5.21**	0	0.034	0.075
High school graduate, or GED	0.433	0.010	43.28**	0	0.413	0.453
Some college, no degree	0.568	0.010	56.92**	0	0.548	0.587
Associate degree, occupational program	0.627	0.010	60.96**	0	0.606	0.647
Bachelors degree	0.783	0.010	77.03**	0	0.763	0.803
Master's, Professional and Doctorate	0.912	0.011	86.14**	0	0.891	0.933
Female	-0.271	0.002	125.93**	0	-0.275	-0.267
Age	1.543	0.006	268.66**	0	1.532	1.554
Age squared	-0.002	0.000	228.37**	0	-0.002	-0.002
U.S. Citizen	0.113	0.004	30.72**	0	0.106	0.120
Northeast	0.065	0.005	14.48**	0	0.057	0.074
South	-0.015	0.004	-3.89**	0	-0.023	-0.008
West	0.049	0.004	12.49**	0	0.041	0.057
Management, Professional and Related Occupations	0.082	0.004	19.44**	0	0.074	0.090
Service occupations	0.117	0.004	28.6**	0	0.109	0.125
Sales & office occupations	-0.142	0.004	-33.15**	0	-0.150	-0.134
Farming, fishing and forestry	-0.348	0.018	-18.9**	0	-0.384	-0.312
Construction, extraction and maintenance occupations	0.012	0.005	2.4**	0.01	0.002	0.022
Production, transportation and material moving occupations	-0.081	0.006	-13.86**	0	-0.092	-0.069
Constant	6.394	0.015	428.52**	0	6.364	6.423

Number of observations =627,928; F( 24,627903) =12421.91; Prob > F = 0; Adj. R2 = .3219 Root MSE = .73552

\* significant at 5%; \*\* significant at 1%

The coefficients remain negative and significant when the sample is split between managerial and non-managerial occupations (see Tables 9 and 10).

Table 9. Multiple Regression Analysis: log of income and wages on socio-demographic, educational, regional for the Public Sector (Managerial Occupations Only)

Log (Income and Wages)	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
Spanish at home & English very well	-0.048	0.004	-13.1**	0	-0.055	-0.041
Spanish at home & English well	-0.095	0.006	-15.5**	0	-0.107	-0.083
Spanish at home & English not well	-0.266	0.011	-23.66**	0	-0.288	-0.244
Spanish at home & no English	-0.316	0.018	-17.3**	0	-0.352	-0.280
5th-8th grade	-0.460	0.030	-15.51**	0	-0.518	-0.402
HS No Diploma	-0.457	0.026	-17.79**	0	-0.508	-0.407
High school graduate, or GED	-0.367	0.024	-15.1**	0	-0.414	-0.319
Some college, no degree	-0.299	0.024	-12.4**	0	-0.346	-0.252
Associate degree, occupational program	-0.230	0.024	-9.4**	0	-0.277	-0.182
Bachelors degree	-0.056	0.024	-2.34**	0.019	-0.104	-0.009
Master's, Professional and Doctorate	0.102	0.024	4.2**	0	0.054	0.149
Female	-0.213	0.003	-66.55**	0	-0.220	-0.207
Age	1.567	0.010	149.99**	0	1.546	1.587
Age squared	-0.002	0.000	-128.66**	0	-0.002	-0.002
Native Born	0.083	0.007	12.71**	0	0.070	0.096
Northeast	0.051	0.008	6.61**	0	0.036	0.066
South	0.023	0.007	3.43**	0.001	0.010	0.036
West	0.059	0.007	8.9**	0	0.046	0.072
Constant	7.165	0.031	228.29**	0	7.103	7.226

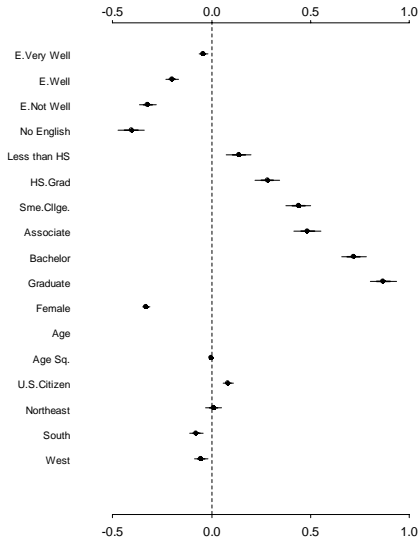
Number of observations =180,304; F( 18,180285) = 3,901.57; Prob > F = 0; Adj. R2 = .2803 Root MSE = .67611  
 \* significant at 5%; \*\* significant at 1%

As for the other variables that have a direct effect on income and wages we found that an increase in years of schooling (up to graduate school) is associated on average with higher wages. However, this monotonic relationship is not always true for all the sectors. For example, the monotonic increase on wages in the manufacturing sector for managerial occupations is true even for those who have a graduate degree. This suggests that different industries require different job skills and those industries that will require more specialized skills will pay for them. The coefficient for age, which can be viewed as a proxy for experience, increases at decreasing rates, that is, it is positive for the linear term and negative for the quadratic term. Finally, as previous research has found, women tend to earn less than men, while, U.S. citizens on average, tend to earn more than those who are not U.S. citizens.

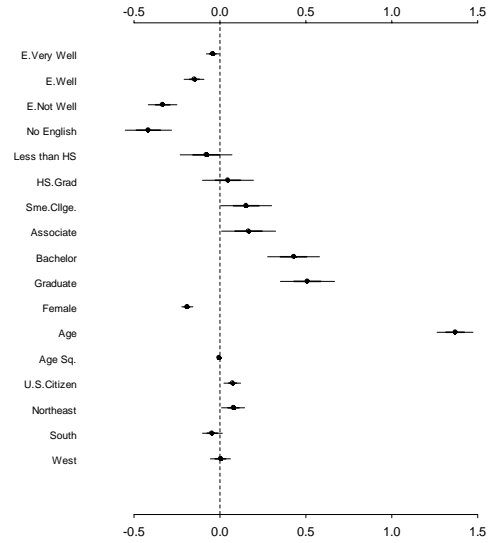
Figures 5-21 present the results from additional tests conducted within sub-samples of the data in graphic format.<sup>19</sup> The comparison of the coefficients of the effect of bilingualism across different occupations suggests that the negative association of bilingualism on wage-based income is negative among managerial, business operations specialists and financial specialists (Figures 5, 6 and 7). The relationship is positive for education and training (Figure 8) healthcare support (Figure 9), protective service (Figure 10) and food preparation and

<sup>19</sup> The graphs plot the point estimate, 95 and 99 percent confidence intervals (dot, thick and thin lines respectively). Please refer to Appendix 1 for a description of the categories included in each occupation, and industry covered in the analyses. The full set of results in tabular format are available from the authors upon request.

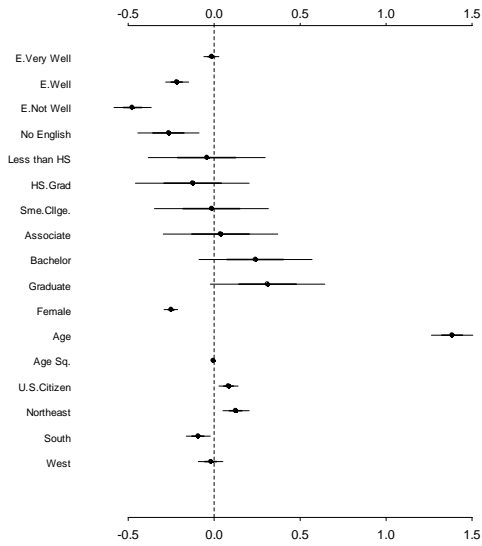
**Figure 5. Regression Coefficient Plot for Management Occupations**



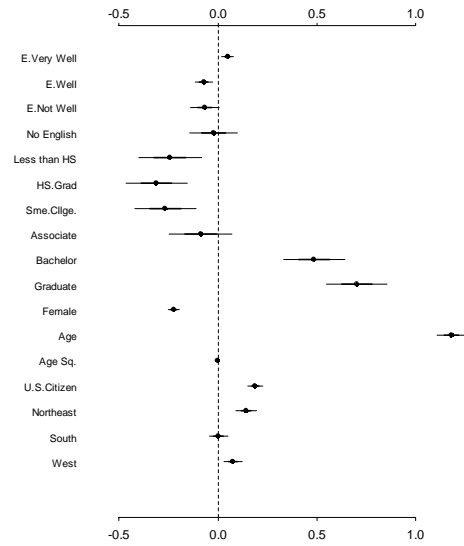
**Figure 6. Regression Coefficient Plot for Business Operations Specialists Occupations**



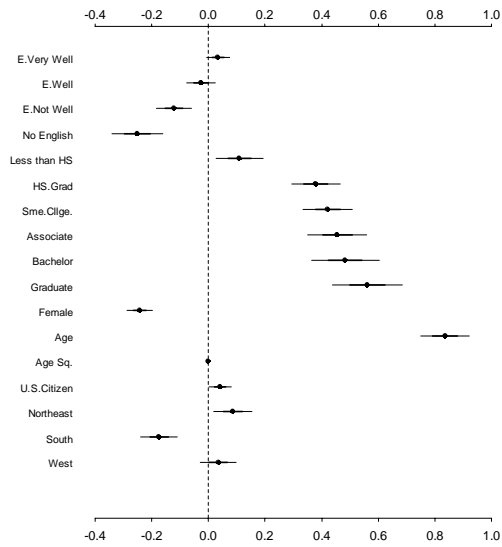
**Figure 7. Regression Coefficient Plot for Financial Specialists Occupations**



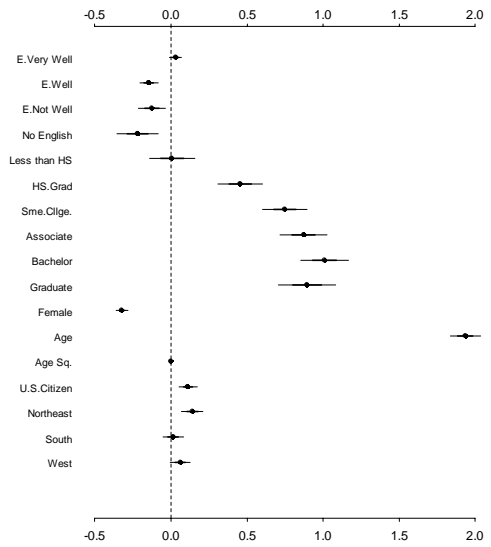
**Figure 8. Regression Coefficient Plot for Education, Training, and Library Occupations**



**Figure 9. Regression Coefficient Plot for Healthcare Support Occupations**



**Figure 10. Regression Coefficient Plot for Protective Service Occupations**



**Figure 11. Regression Coefficient Plot for Food Preparation and Serving Occupations**

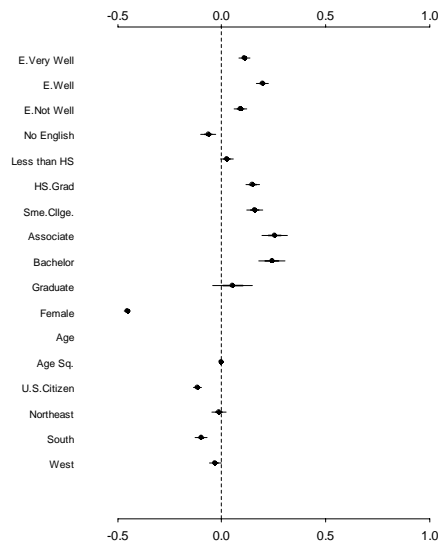


Table 10. Multiple Regression Analysis: log of income and wages on socio-demographic, educational, regional for the Public Sector (Non-Managerial Occupations Only)

Log (Income and Wages)	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
Spanish at home & English very well	-0.021	0.003	-7.81**	0	-0.026	-0.015
Spanish at home & English well	-0.110	0.004	-26.61**	0	-0.118	-0.101
Spanish at home & English not well	-0.197	0.007	-29.69**	0	-0.210	-0.184
Spanish at home & no English	-0.212	0.012	-17.76**	0	-0.236	-0.189
5th-8th grade	-0.059	0.013	-4.53**	0	-0.084	-0.033
HS No Diploma	0.125	0.012	10.71**	0	0.102	0.148
High school graduate, or GED	0.549	0.011	49.35**	0	0.527	0.571
Some college, no degree	0.699	0.011	62.99**	0	0.677	0.721
Associate degree, occupational program	0.760	0.012	65.94**	0	0.737	0.782
Bachelors degree	0.923	0.012	80.05**	0	0.900	0.945
Master's, Professional and Doctorate	0.963	0.013	71.63**	0	0.936	0.989
Female	-0.301	0.003	-107.41**	0	-0.307	-0.296
Age	1.565	0.007	225.58**	0	1.551	1.578
Age squared	-0.002	0.000	-191.38**	0	-0.002	-0.002
Native Born	0.126	0.004	28.59**	0	0.118	0.135
Northeast	0.073	0.006	13.16**	0	0.062	0.083
South	-0.027	0.005	-5.6**	0	-0.037	-0.018
West	0.048	0.005	10.03**	0	0.039	0.057
Service occupations	0.124	0.004	29.2**	0	0.115	0.132
Sales & office occupations	-0.118	0.005	-26.02**	0	-0.127	-0.109
Farming, fishing and forestry	-0.316	0.019	-16.75**	0	-0.353	-0.279
Construction, extraction and maintenance occupations	0.016	0.005	3.17**	2	0.006	0.026
Production, transportation and material moving occupations	-0.063	0.006	-10.51**	0	-0.075	-0.051
Constant	6.248	0.017	362.03**	0	6.214	6.282

Number of observations =447,624; F( 23,447600) = 8,931.86; Prob > F = 0; Adj. R2 = .3145 Root MSE = .75406  
 \* significant at 5%; \*\* significant at 1%

serving (Figure 11) occupations.<sup>20</sup> The breakdown by industry (Figures 6.a-6.f) shows that in all sub-sectors, except finance and real estate, and transportation and warehousing, bilingual Hispanics tend to earn more than English monolinguals. Last, we find that the association between bilingualism and income is substantively larger in the regions with lower concentration of Hispanics (Northeast and Midwest); yet the positive association remains across all regions (see Figures 7-a-7.d). In all but three of the sub-samples used in our analyses, we find that income increases monotonically with the ability to speak English, consistent with the results for the whole population.

<sup>20</sup> In food preparation and serving occupations the results suggest that all Hispanics with a minimum command of English earn more than English monolinguals.



## | 5 | DISCUSSION

Overall our results for the whole pooled sample suggest that bilingualism is no longer penalized as it seems to have been in 1990. Earnings of Hispanics who speak Spanish at home and also speak English very well are slightly higher than those of Hispanics who only speak English. And the positive effect of bilingualism on earnings holds after controlling for educational attainment, region, sector of employment, occupation, age and gender. This pattern supports our expectation that recent U. S and Hispanic social, demographic and economic trends have increased the market value of Spanish/English bilingualism. In the past decade Mexico and the rest of Latin America have become increasingly important to national economic life. Additionally, supplying goods and services to the ever-growing Hispanic community in the United States, especially those who are Spanish dominant, and managing workers with minimal English language skills who hardly speak English are also likely to create better paid job opportunities for bilingual Latinos who can communicate with their customers, employees and subordinates in Spanish, and in English with their supervisors, business owners, and upstream and downstream suppliers.

While these developments help explain the discrepancy between the overall positive albeit small coefficient in our tests and the negative findings for 1990 reported by de la Garza et al. (2000), it is especially noteworthy that our results also show that being bilingual is penalized in several specific labor market segments and occupations. That is, the positive effect for the overall sample is not only substantively small, but bilingualism has a negative impact on wages in key sectors of the economy, in the more rewarding occupations, and within occupational categories of other sectors.

We expected that bilingualism was a skill that the market rewarded. This skill would enable Latinos to serve both Spanish-speaking and English-speaking customers and to have access to trade and investment opportunities in Latin America would give bilinguals an edge over English monolinguals. Yet our results oblige us to reject an unconditional interpretation of that perspective and to re-evaluate how the market evaluates bilingualism.

There are sound theoretical reasons to expect English fluency to have a positive effect on earnings, but we had no comparable basis for predicting that bilinguals who know English well would be punished in the labor market as we found to be true in some labor markets and employment sectors. In manufacturing, for instance, we find that bilingual blue-collar workers who speak English well or very well receive higher earnings than similarly situated English monolinguals, but bilingual supervisory and managerial employees earn less than their monolingual counterparts. These patterns paint a picture that suggests that bilingual Latinos who hold higher status jobs confront a glass ceiling.<sup>21</sup>

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<sup>21</sup> An alternative explanation for the negative coefficient on bilingualism found in the sub-sample of managerial and supervisory positions in manufacturing could be traced on a different pattern of regional clustering of these individuals and their penchant for consumption and ability to supply “ethnic goods.” If bilingual Latinos in managerial position are mostly employed in small or medium sized firms that supply ethnic goods to Latino customers in markets characterized by low barriers to entry and no economies of scale, then we could expect them to have lower earnings than those employed in firms competing in less competitive markets characterized by higher entry barriers and economies. Still we need to explain why bilingual Latinos are more likely to be employed in the former rather than the latter, given the earnings differentials.

More significantly, we find that bilinguals employed in the public sector make systematically less money than those who only speak English. And these results hold for all occupational categories in the sector. Given that the public sector provides a wide range of crucial goods and services to Spanish dominant Latinos it is remarkable that those that speak Spanish seem to be penalized. These results suggest that bilingual Latinos are experiencing systematic discrimination.

One possibility mitigating factor is that bilinguals may have characteristics that lower their value in labor markets irrespective of their quality and skill as workers. Most specifically, compared to English monolinguals, Spanish speakers are much more likely to speak accented English, a trait employers especially frown on if the accent is heavy (Davila, Bohara, and Saenz 1993). Depending on how stringently accented English is evaluated, punishing bilinguals who speak with an accent could be considered discrimination. Moreover, employers could exaggerate the importance they assign to accents as a means to justify discrimination in hiring and wages.

Additionally, it is conceivable that being bilingual is correlated with unobservable characteristics that are negatively valued in the market place. One such trait would be a lack of familiarity with mainstream labor practices and other values. Hispanics who speak English only are more likely to be third or even fourth generation Americans, and hence are better assimilated to American labor practices. Another unobserved characteristic which census data do not capture is the quality of education Latinos receive. Given that Hispanics live in areas with high Hispanic concentrations, they are likely to attend similar types of educational institutions wherever they reside, and it has been well documented, the quality of educational services in those schools is lower than that of schools in more integrated schools which are attended by Hispanics who are more likely to be English dominant. To the extent these patterns accurately describe the educational experiences of Latinos, our measure of educational attainment, i.e., years of school completed, may falsely suggest that Latinos and non-Hispanic whites who attended school for the same number of years are comparably educated. Table 9 illustrates the income and wages for non-Hispanic whites and Latinos by educational attainment. On average, Latinos earn 19 percentage points less than non-Hispanic whites with the same educational attainment. This difference is more evident at higher levels of education. For instance, Hispanic professionals earn 46 percentage points less than non-Hispanic white professionals.

Table 11. Income and Wages by Educational Attainment by Race/Ethnicity

Years of Education	% Difference		
	White	Hispanic	Difference
No School	\$ 13,000	\$ 13,800	6%
1 – 4 <sup>th</sup> Grade	\$ 13,100	\$ 13,000	-1%
Elementary School	\$ 14,000	\$ 14,000	0%
12 <sup>th</sup> Grade	\$ 17,000	\$ 15,000	-12%
HS Graduate	\$ 21,000	\$ 17,000	-19%
Some College	\$ 23,000	\$ 20,000	-13%
Bachelor's Degree	\$ 36,000	\$ 31,000	-14%
Masters	\$ 45,000	\$ 40,000	-11%
Professional	\$ 57,000	\$ 30,700	-46%
Doctorate	\$ 57,000	\$ 46,600	-18%
Average	\$ 29,610	\$ 24,110	-19%

Source: IPUMS 5% 2000

Interpreting the meaning of “years of school” in this way makes our findings less puzzling but no less discomfoting since it implies that Spanish speakers are systematically exposed to educational services of lower quality that puts them at a disadvantage in the marketplace. The findings that the value of being fluent in both English and Spanish is negative, albeit within those sectors of employment and occupations that are usually associated with higher responsibility and pay, is not only puzzling but also distressing

## | 6 | CONCLUSION

This paper tries to assess the effect of bilingualism on income among. To isolate the effect of bilingualism we limit our analysis to a sample Hispanics drawn from the year 2000 U.S. Census five-per-cent PUMS. In contrast with earlier research that tested similar hypotheses on census data for the year 1990, we find that in 2000 that bilingual Latinos who speak English very well and speak Spanish at home on average earn at least as much as those who speak only English. Yet we also find that bilingualism is not rewarded in all sectors of the economy. Our results show a negative correlation between bilingualism and income for managerial and supervisory employees in manufacturing, and for all those employed in the public sector.

We point to several possible explanations for these findings: reduced inter-industry and regional mobility and competition; labor market discrimination; and differential access to quality educational services. We acknowledge that our analysis has several shortcomings associated with the validity of our measures of bilingualism and educational attainment. We have no way to overcome these limitations, however.

We suggest two different routes that would help extend our research and help us overcome these limitations. The first would be to analyze the effect of bilingualism within jobs that require certification, such as teachers and nurses. In these cases, the existence of certification requirements would allow us to control for skill regardless of language problems such as accented English. Alternatively, we could look at the difference in performance within groups of individuals graduating from similar institutions, such as Ivy League universities, who have secured jobs in the same industry or sector. Controlling for quality of education would allow us to further isolate the effect of bilingualism on income.

Our results enhance our ability to evaluate the major contemporary theories on minority incorporation and assimilation, namely segmented assimilation (Portes & Zhou 1993), modified straight line assimilation (Alba and Nee 2003), and the more recent version of the unassimilable ethnic (Huntington 2004a, 2004b). We argue that the results are generally supportive of the theory of segmented assimilation (see Portes & Zhou, 1993). However, our findings are more negative than those predicted by segmented assimilation theory because they suggest that few Latinos will be capable of experiencing conventional assimilation. Also, our results portray a level of continuing discrimination that refutes the core of Alba and Nee's (2003) modification of conventional assimilation theory. The monotonic increase in the earnings of Hispanics as their English language proficiency increases also seemingly refutes Huntington's (2004a 2004b) theory of the unassimilable ethnic.<sup>22</sup> One plausible conclusion suggested by our findings is precisely the opposite to Huntington's argument: the existence of deeply institutionalized patterns of discrimination rather than Latino values prevent Latino incorporation..

Finally, our results suggest the need for several policy interventions. First, state and national governments should reward bilingualism as a skill in those positions where specific second languages are essential to job performance. Thus, bilingual health workers, teachers, border patrol agents, police and fire department personnel should earn more than their monolingual

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<sup>22</sup> Huntington (2004a 2004b) denies the existence of discrimination as the condition impeding incorporation and argues that the failure of Hispanics to assimilate is due to innate cultural differences and their rejection of American values, including English.

colleagues while those whose language skills are not essential to their job such as sanitation workers would not receive additional compensation. Second, Latino educational opportunities should be enhanced so that the value of their education is equalized relative to that of non-Hispanic whites. This could be accomplished by providing increased support to high schools, junior colleges and universities with large proportions of Latino students and by increasing the funds available to Latinos who are accepted to first tier public and private universities. Regretably, the current configuration of our political system makes it unlikely that such policies will be enacted.

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# APPENDIX A. OCCUPATION AND INDUSTRY CODES

## 2000 Occupation Codes

### Management Occupations

Chief Executives  
General and Operations Managers  
Legislators  
Advertising and Promotions Managers  
Marketing and Sales Managers  
Public Relations Managers

Administrative Services Managers  
Computer and Information Systems Managers  
Financial Managers  
Human Resources Managers  
Industrial Production Managers  
Purchasing Managers  
Transportation, Storage, and Distribution Managers  
Farm, Ranch, and Other Agricultural Managers  
Farmers and Ranchers  
Construction Managers  
Education Administrator  
Engineering Managers  
Food Service Managers  
Funeral Directors  
Gaming Managers  
Lodging Managers  
Medical and Health Services Managers  
Natural Sciences Managers  
Postmasters and Mail Superintendents  
Property, Real Estate, and Community Association Managers  
Social and Community Service Managers  
Managers, All Other

### Financial Specialists

Accountants and Auditors  
Appraisers and Assessors of Real Estate  
Budget Analysts  
Credit Analysts  
Financial Analysts  
Personal Financial Advisors  
Insurance Underwriters  
Financial Examiners  
Loan Counselors and Officers  
Not used  
Tax Examiners, Collectors, and Revenue Agents  
Tax Preparers  
Financial Specialists, All Other

### Protective Service Occupations

First-Line Supervisors/Managers of Correctional Officers  
First-Line Supervisors/Managers of Police and Detectives  
First-Line Supervisors/Managers of Fire Fighting and Preventions Workers

### Business Operations Specialists

Agents and Business Managers of Artists, Performers, and Athletes  
Purchasing Agents and Buyers, Farm Products  
Wholesale and Retail Buyers, Except Farm Products  
Purchasing Agents, Except Wholesale, Retail, and Farm Products  
Claims Adjusters, Appraisers, Examiners, and Investigators  
Not used  
Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation  
Cost Estimators  
Not used  
Human Resources, Training, and Labor Relations Specialists  
Logisticians  
Management Analysts  
Meeting and Convention Planners  
Other Business Operations Specialists

### Education, Training, and Library Occupations

Postsecondary Teachers  
Preschool and Kindergarten Teachers  
Elementary and Middle School Teachers  
Secondary School Teachers  
Special Education Teachers  
Other Teachers and Instructors  
Archivists, Curators, and Museum Technicians  
Librarians  
Library Technicians  
Teacher Assistants  
Other Education, Training, and Library Workers

### Healthcare Support Occupations

Nursing, Psychiatric, and Home Health Aides  
Occupational Therapist Assistants and Aides  
Physical Therapist Assistants and Aides  
Massage Therapists  
Dental Assistants  
Medical Assistants and Other Healthcare Support Occupations

### Food Preparation and Serving Occupations

Chefs and Head Cooks  
First-Line Supervisors/Managers of Food Preparation and Serving Workers  
Cooks  
Food Preparation Workers  
Bartenders  
Combined Food Preparation and Serving Workers, Including Fast Food Counter Attendants, Cafeteria, Food Concession, and Coffee Shop Waiters and Waitresses  
Food Servers, Nonrestaurant  
Dining Room and Cafeteria Attendants, Bartender Helpers, and Miscellaneous Food Preparation and Serving Related Workers  
Dishwashers  
Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop

Supervisors, Protective Service Workers, All  
Other

Fire Fighters

Fire Inspectors

Bailiffs, Correctional Officers, and Jailers

Not used

Detectives and Criminal Investigators

Fish and Game Wardens

Miscellaneous Law Enforcement Workers

Police Officers

Transit and Railroad Police

Animal Control Workers

Private Detectives and Investigators

Security Guards and Gaming Surveillance  
Officers

Not used

Crossing Guards

Lifeguards and Other Protective Service Workers

Food Preparation and Serving Related Workers, All Other

## Codes for Industry (IND) and NAICS Industry (INDNAICS) in the 2000 Census and ACS Samples

### Wholesale Trade

Motor vehicles, parts and supplies  
Furniture and home furnishing  
Lumber and other construction materials  
Professional and commercial equipment and supplies  
Metals and minerals, except petroleum  
Electrical goods  
Hardware, plumbing and heating equipment, and supplies  
Machinery, equipment, and supplies  
Recyclable material  
Miscellaneous durable goods  
Paper and paper products  
Drugs, sundries, and chemical and allied products  
Apparel, fabrics, and notions  
Groceries and related products  
Farm product raw materials  
Petroleum and petroleum products  
Alcoholic beverages  
Farm supplies  
Electronic markets, agents and brokers  
Miscellaneous nondurable goods  
Not specified trade

### Transportation and Warehousing

Air transportation  
Rail transportation  
Water transportation  
Truck transportation  
Bus service and urban transit  
Taxi and limousine service  
Pipeline transportation  
Scenic and sightseeing transportation  
Services incidental to transportation  
Postal service  
Couriers and messengers  
Warehousing and storage

### Finance, Insurance, Real Estate, and Rental and Leasing

Banking and related activities  
Savings institutions, including credit unions  
Non-depository credit and related activities  
Securities, commodities, funds, trusts, and other financial investments  
Insurance carriers and related activities  
Real estate  
Automotive equipment rental and leasing  
Video tape and disk rental  
Other consumer goods rental  
Commercial, industrial, and other intangible assets rental and leasing

### Retail Trade

Automobile dealers  
Other motor vehicle dealers  
Auto parts, accessories, and tire stores  
Furniture and home furnishings stores  
Household appliance stores  
Radio, tv, and computer stores  
Building material and supplies dealers  
Hardware stores  
Lawn and garden equipment and supplies stores  
Grocery stores  
Specialty food stores  
Beer, wine, and liquor stores  
Pharmacies and drug stores  
Health and personal care, except drug, stores  
Gasoline stations  
Clothing and accessories, except shoe, stores  
Shoe stores  
Jewelry, luggage, and leather goods stores  
Sporting goods, camera, and hobby and toy stores  
Sewing, needlework and piece goods stores  
Music stores  
Book stores and news dealers  
Department stores  
Miscellaneous general merchandise stores  
Florists  
Office supplies and stationary stores  
Used merchandise stores  
Gift, novelty, and souvenir shops  
Miscellaneous stores  
Electronic shopping and mail-order houses  
Electronic shopping  
Electronic auctions  
Mail-order houses  
Vending machine operators  
Fuel dealers  
Other direct selling establishments  
Not specified trade

**Professional, Scientific, Management, Administrative**

Legal services  
Accounting, tax preparation, bookkeeping and payroll services  
Architectural, engineering, and related services  
Specialized design services  
Computer systems design and related services  
Management, scientific and technical consulting services  
Scientific research and development services  
Advertising and related services  
Veterinary services  
Other professional, scientific and technical services  
Management of companies and enterprises  
Employment services  
Business support services  
Travel arrangements and reservation services  
Investigation and security services  
Services to buildings and dwellings  
Landscaping services  
Other administrative, and other support services

**Waste Management Industry**

Waste management and remediation services

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