THE ETHNIC AND RACIAL
CHARACTER OF SELF-EMPLOYMENT

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ABSTRACT

Using the 1980 and 1990 Censuses, we show that self-employment rates differ substantially across ethnic and racial groups in the U.S. These differences exist for both men and women, within broad combinations of ethnic/racial groups such as Europeans, Asians, Hispanics and blacks, and after controlling for variables such as age, education, immigrant status and time in the country. Although there are large differences in self-employment rates across ethnic/racial groups, the processes determining self-employment within each ethnic/racial group are not substantially different. We find fairly similar effects of age, education, year of immigration, and other factors in determining who is self-employed for most groups.

We examine whether ethnic/racial self-employment rates are associated with group returns to self-employment. We find evidence of a positive association between an ethnic/racial group's self-employment rate and the difference between average self-employment and wage/salary earnings for that group. This result suggests that our economic model of the self-employment decision may be useful in explaining differences in self-employment rates across ethnic/racial groups. We also find that different ethnic/racial groups locate their businesses in different types of industries. In addition, we do not find evidence that ethnic/racial groups who immigrate from countries with high self-employment rates have high self-employment rates in the U.S.

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1. Introduction

Self-employment rates differ substantially across ethnic and racial groups in the United States. For example, data from the 1990 Census of Population indicate that only 4.4 percent of employed African-American men and 2.0 percent of employed African-American women work for themselves. In contrast, Korean-American men and women have self-employment rates of 27.9 percent and 18.9 percent, respectively.[1] Large differences in self-employment rates remain even after adjusting for differences in individual characteristics such as age, education, and number of years living in the U.S. There is much speculation and anecdotal evidence about the ethnic and racial character of self-employment, and there are many good studies which focus on individual ethnic or racial groups. However, there is little evidence from nationally representative surveys in which cross group comparisons are made with comparable data. Extensive research has documented the features of certain ethnic and racial groups, but there is much less research determining which features are common to many groups and which are unique. In this paper, we document the enormous differences in self-employment rates across a large number of ethnic/racial groups. In addition, we examine many of the possible explanations for these differences.

Understanding the ethnic/racial character of self-employment is important for at least three reasons. First, conflicts between ethnic and racial groups in the U.S. have often been partly caused by business ownership patterns.[2] The racial conflict between Koreans and African-Americans in many large cities, in large part due to the presence of Korean-owned businesses in black communities, is just the latest example.[3] Second, self-employment has

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[1] These figures are documented in Section 5.

[2] Some interesting evidence is reported in Lieberson and Silverman (1971) who find that African-American self-employment rates were generally lower for cities in which ghetto riots occurred over the period from 1913 to 1963 than for comparison non-riot cities.

[3] See In-Jin Yoon (1991b) for a description of the causes and character of the racial tensions between Koreans and African-Americans in Chicago.

historically been a route of economic advancement for some ethnic groups.[4] The success of

Chinese and Japanese immigrants in the U.S. is substantially due to their ownership of small

businesses.[5] Self-employment has also been proposed as a route out of poverty and is

currently being promoted by many states and the federal government as a way to leave the

welfare and unemployment insurance rolls.[6] Third, small business owners have an

important effect on political decisions in the U.S.[7] The underrepresentation of many

ethnic/racial groups in business means that these groups may possess less political power

than is suggested by their proportion of the population.

In this paper, we explore many aspects of ethnic and racial self-employment. Our

main concerns are documenting the huge variation in self-employment rates across

ethnic/racial groups, determining the causes of these differences, and analyzing the industry

patterns of ethnic/racial groups. This paper consists of 9 sections which are briefly discussed

below. First we review the sociology literature on ethnic and racial entrepreneurship and

discuss its limitations in explaining the differences in self-employment rates across groups.

In the next section, we discuss the economic literature and its limitations. Section 4

describes the data set used in the analysis and the process for creating ethnic/racial group

classifications. Section 5 documents the differences in self-employment rates across groups

for both men and women. In Section 6, the individual-level determinants of self-employment

are analyzed along with their ability to explain the differences across ethnic/racial groups.

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[4]Glazer and Moynihan (1970, p. 36) argue that "business is in America the most effective form of social mobility for those who meet prejudice."

[5]See Light (1972) for a description of the history of Chinese and Japanese in the U.S. and Loewen (1971) for a description of Chinese in Mississippi.

[6]See Guy et al. (1991) for a description of the program promoting self-employment among AFDC recipients and Benus et al. (1992) for a description of the program promoting self-employment among unemployment insurance recipients.

[7]See Brown et al. (1990).

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We also test whether these determinants of self-employment are similar across groups. In Section 7, we compare group level self-employment rates to group level differences in self-employment earnings, wage/salary earnings, and unearned income. We examine if self-employment rates appear to be determined by comparisons of potential earnings from self-employment and wage/salary work. Section 8 documents the industry distribution of several ethnic/racial groups. Section 9 briefly examines whether ethnic/racial group self-employment rates in the U.S. are related to home country self-employment rates. Section 10 concludes with a summary.

2. Past Work: The Sociology Literature

The sociology literature on the ethnic and racial nature of self-employment is extensive, with numerous studies focusing on a wide range of topics. Due to the large number of sociological theories of self-employment and the difficulty of classifying these theories, only some of the prominent theories are presented below.[8] In addition, we discuss the empirical evidence that supports or contradicts these theories.

Several authors argue that self-employment is more common among immigrant groups that expect to spend a short time in the U.S. Individuals in these groups are called sojourners.[9] It is argued that sojourners select occupations that not only allow them to accumulate wealth rapidly, but also ones that do not require extended periods of residence. Therefore, sojourners avoid occupations that require extensive periods of training or levels of education and choose occupations such as owning a small business in commerce and trade.

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[8]Aldrich and Waldinger (1990) and Light (1984, 1992) provide comprehensive reviews of both the theoretical and empirical literature on this subject.

[9]See Bonacich (1973) who points out that some ethnic minorities concentrate in occupations such as trade and commerce and play the role of middleman in many economic relations. She argues that these middleman groups are sojourners, immigrants who do not plan to settle permanently in the host country.

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Light (1979) suggests that the Chinese in the 19th century are a good example of sojourners because they planned their lives in the U.S. around returning to China. He also identifies a counterexample to the theory in Jews who settled in the U.S. Historically, they were more highly represented in trade than any of the sojourning white ethnic groups, even though these Jews had no intention of leaving the U.S. Another ethnic group that does not fit the theory is Koreans. Min (1984) discovers that recent Korean immigrants came to the U.S. permanently, and indicate in personal interviews that they do not consider themselves sojourners. Aldrich and Waldinger (1990) argue that a key weakness of the theory is that it would be more logical for sojourners to choose a less risky wage/salary job over opening a small business.[10] They also refer to several case studies in which sojourners avoid self-employment or are no more successful in self-employment than those not sojourning.

A second theory argues that disadvantages such as poverty, unemployment or discrimination cause certain groups to favor self-employment.[11] By lowering the returns to wage/salary work, these disadvantages may push minorities and immigrants towards self-employment. Minorities may be disadvantaged by a lack of human capital which excludes them from obtaining many desirable wage/salary jobs. Immigrants may face disadvantages such as a difficulty speaking English, and the possession of job skills and education that are not completely transferrable to the U.S.

Support for this theory comes from several sources. Light (1972) argues that around the turn of the century both the Chinese and Japanese were facing severe discrimination in the labor market, and thus were pushed into self-employment in large numbers. Min (1984) analyzes the exceptionally high rate of self-employment among Koreans in the U.S. By

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[10]The high risk of self-employment is well documented. For example, Evans and Leighton (1989) find that approximately one-third of the self-employed in their sample of white men exit within the first 3 years of entry and approximately one-half exit within 7 years of entry.

[11]See Light (1972) and economists Sowell (1981) and Moore (1983).

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interviewing a large number of Korean businessmen in Atlanta he finds that disadvantages facing Koreans, such as their language barrier and their perceptions of having disadvantages in non business occupations, play an important role in pushing these Koreans into self-employment. The disadvantage theory explains why minority and immigrant ethnic groups in general are pushed towards self-employment, but it has difficulty explaining the large variation in self-employment rates across minority and immigrant groups. For example, the theory alone cannot explain why African-Americans have a lower self-employment rate than Chinese-Americans even though they are relatively more disadvantaged as a group.

Light (1984) recognizes these limitations and suggests that differences across groups in what he calls ethnic and class resources may explain much of the variation. Ethnic resources include entrepreneurial cultural endowments, skills transmitted by co-ethnics, group solidarity, and sojourning orientation. Ethnic resources also include ethnic foods that can only be provided by co-ethnics, cheap labor that is more easily provided by co-ethnics, formal and informal support networks, and trade organizations. It is argued that these features of an ethnic group benefit its business owners. Class resources can be either cultural, such as bourgeois values, attitudes, and knowledge and skills transmitted intergenerationally, or material, such as property used for production or distribution, human capital, and financial capital. Light argues that equally disadvantaged ethnic minorities can have different rates of self-employment because of differences in ethnic and class resources. He suggests that an ordering can be made for the self-employment rates of disadvantaged minorities; the highest rates are for groups with substantial levels of both ethnic and class resources, the middle rates for groups with a high level of either type of resource, and the lowest rates for groups possessing low levels of both resources.[12] Light concludes that

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[12]See Yoon (1991a) for a discussion of the relative importance of ethnic and class resources for Korean businesses.

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ethnic and immigrant minority groups are overrepresented in self-employment, because they have access to ethnic resources whereas native workers do not.[13]

Aldrich and Waldinger (1990) and other researchers identify several advantages possessed by certain ethnic groups that are examples of ethnic resources promoting entrepreneurship. An ethnic group's ability to transfer information related to running a business to and from co-ethnics is an important factor in determining the group's success in entrepreneurship. There is substantial evidence that experience as an employee of a small business and transfers of information are important.[14] To explain the large variation in self-employment rates by ethnicity, there must exist different levels of initial business experience across ethnic groups or different abilities at transferring information across ethnic groups. Certain ethnic groups may have more experience at creating formal and informal support networks that benefit small businesses.[15]

The cultural theory of entrepreneurship states that certain ethnic or immigrant groups are successful in self-employment because of their cultural attributes. Immigrants from countries with a tradition of buying and selling are more likely to become entrepreneurs than immigrants from countries without this tradition. Frazier (1957) argues that a main cause of the lack of African-American entrepreneurs is the absence of a tradition in the field of

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[13]See Light (1984) for a discussion that emphasizes ethnic resources in explaining the high rates of self-employment for Cubans and Koreans. Wong (1987) presents evidence suggesting that ethnic resources contribute to the success of Chinese-owned garment factories in New York.

[14]See Portes and Zhou (1991) for evidence on the importance of prior employment at a small business for Dominicans and Cubans. Meyer (1990) finds strong effects of prior employment at a small business on the probability of starting one's own business.

[15]Wong (1977) argues that the existence of trade associations among Chinese grocery stores is an important determinant of their success relative to African-Americans. Differing propensities of ethnic groups in creating trade associations may explain part of the differences in self-employment rates.

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business enterprise for this group.[16] However, Aldrich and Waldinger (1990) report examples of high self-employment rates among groups with little or no business experience in the past, including Greeks running restaurants who originated in fishing villages and rural areas.

Another advantage possessed by some ethnic groups is that their access to co-ethnics or family members in a community may provide an edge in hiring low-paid workers. These workers may have limited job opportunities because they have problems speaking English.[17] One should note that the vast majority of the self-employed do not have any employees (besides themselves), so that this argument cannot explain much of the large differences in self-employment rates.[18] In addition, small business owners do not exclusively hire co-ethnics. Kim and Hurh (1985) estimate that among the Korean-owned stores in South Chicago which hire at least one employee, 68 percent hire at least one black employee and 33 percent hire at least one Hispanic employee.[19]

An ethnic group's access to rotating credit associations provides another advantage. These associations may provide ethnic members with substantial levels of start-up capital. Light (1972) argues that access to these associations is one of the important reasons that

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[16]Fratoe (1988) supports this argument by providing evidence that African-American business owners have less exposure to entrepreneurial role models and training in firms operated by close relatives than Asian, Hispanic, or nonminority owners. However, this may simply be a consequence rather than a cause of the low African-American self-employment rate.

[17]Boyd (1990) provides evidence that the differential usage of family members by Asians and African-Americans explains part of the discrepancy in self-employment rates. Zimmer and Aldrich (1987) provide evidence that Asian shopkeepers employ family and relatives to a greater extent than white shopkeepers in Britain. However, they find little difference between the two groups in their use of immediate family members for labor.

[18]See U.S. Bureau of the Census (1987) which indicates that about 80 percent of small businesses have no employees (besides the owner). However, this argument may explain why some ethnic groups are more successful at running larger enterprises that do have employees.

[19]More evidence is provided by Yoon (1991a) who finds that 70 percent of the total employees in his sample of Korean-owned stores located in black neighborhoods of Chicago are African-American.

Chinese, Japanese, and West Indian blacks are better able to start local businesses than American born blacks. One should note, though, that it is easy to overstate the role of rotating credit. It appears that most Korean rotating credit associations generally provide very short-term capital, and it is hard to distinguish their role in providing loans from their role as a saving mechanism.[20] It may be that their primary role is providing group encouragement to save.

A final example of an ethnic resource is preferences for special goods and services that co-ethnics may have an advantage in providing.[21] These products may serve as an initial niche for ethnic entrepreneurs. Examples of such products include exotic vegetables that Chinese immigrants sold to each other, Kosher wine and matzos that Jewish entrepreneurs sold to other Jews, and pasta that Italians sold to their former countrymen. On the other hand, Aldrich and Waldinger (1990) argue that these ethnic markets can be limiting. Further success depends on the ability of the entrepreneurs of an ethnic group to expand outside of these markets. Portes (1987) provides an example of how Cubans in Miami started out by serving mainly their own ethnic community and then expanded to industries such as clothing and construction in which there was a much broader market. The special demands theory cannot entirely explain the variation in entrepreneurship across ethnic groups because as Light (1972) argues some groups such as the Chinese and Japanese historically were successful in catering not only to the exotic tastes of their co-ethnics, but also to the tastes of the general public.

The special demands argument is sometimes combined with the argument that residential concentration of some ethnic groups provides a large market and more

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[20]See Light, Kwuon and Zhong (1990) for an excellent description of Korean rotating credit in Los Angeles.

[21]This is an old argument that can be found in Kinzer and Sagarin (1950), Glazer and Moynihan (1970), and Light (1972).

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opportunities for co-ethnics to become self-employed. There is also contrary evidence on the importance of ethnic agglomerations (or enclaves) in Aldrich and Waldinger (1990) who cite evidence from early in this century on the self-employment rates of Jews. Jewish self-employment rates were higher in areas outside the main enclave in New York City. Aldrich and Waldinger argue that competition from co-ethnics can limit business opportunities for some groups.[22] Another example is provided in Sengstock (1974). She reports that the high concentration of Iraqi-owned grocery stores in the inner city of Detroit has caused these owners to expend substantial amounts of money and effort in competing with each other for customers.

Besides these ethnic resources, class resources (in the terminology of Light) such as education and assets may also benefit certain ethnic groups. These resources may be due to selective immigration of certain types of people from their home countries. For example, both Cubans and Koreans who immigrated to the U.S. on average had more education or worked in more skilled jobs than those left behind, and many came with substantial financial resources. Light (1984) refers to several studies providing evidence that most Korean Immigrants residing in Los Angeles brought large sums of capital with them, and Perez (1986) provides evidence that many Cuban immigrants who fled Castro's policies came with substantial capital.

Each of the sociological theories presented above finds some support in at least one ethnic or racial group, but all of the theories have counterexamples or other weaknesses. The empirical studies in the literature generally focus on only a few groups, using them to identify the strengths and weaknesses of the theories. With such a large number of theories, these studies run the risk of devising an ad hoc explanation for each group and provide little grounds for generalization. Furthermore, these theories and empirical studies leave

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[22]For example, an individual considering opening a Chinese restaurant may be more likely to succeed in an area with very few Chinese restaurants than in a Chinatown of a large city.

unexplained much of the large variation in self-employment rates across ethnic/racial groups in the U.S.

3. Past Work: The Economics Literature

Although ethnic self-employment has received much attention in the sociology literature, it has been almost ignored by economists.[23] The economics literature tends to focus on individual characteristics that would promote self-employment rather than focus on group characteristics. Nevertheless, mean values of these individual characteristics may differ across ethnic/racial groups, allowing the economic theories to partly explain group rates of self-employment.

There are several theoretical models of self-employment in the economics literature which emphasize different aspects of an individual's choice between self-employment and wage/salary work at a point in time.[24] Lucas (1978) assumes that there exists a distribution of managerial talent across individuals in the work force. Those who become entrepreneurs are the ones with the most managerial ability. Kihlstrom and Laffont (1979) model the entrepreneurial decision as one in which an individual's aversion to risk plays a prominent role. The decision to become an entrepreneur is based on a comparison of the risky return of self-employment to the less risky return of wage/salary work. Evans and Jovanovic (1989) analyze the effects of liquidity constraints on the decision to be self-employed. Their model assumes that both entrepreneurial ability and initial wealth positively influence the decision.

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[23]See Aronson (1991) for a summary of the scant economic literature on racial and immigrant self-employment.

[24]A dynamic model of the entrepreneurial decision is presented in Jovanovic (1982). In this model those who become entrepreneurs learn about their managerial abilities over time. The more able entrepreneurs remain and expand output, while the less able fail.

A combination of these models provides what can be considered the economic approach to self-employment. The decision to become an entrepreneur is based on comparing the expected utility from self-employment to that from wage/salary work. Both attributes of an individual's utility function and determinants of the distribution of earnings in the two sectors enter the expected utilities. Let an individual's net income depend on entrepreneurial ability, θ_i, and amount of initial wealth or potential start-up capital, A_i. The individual's earnings from wage/salary work depend on his/her potential wage in the labor market, w_i. Also, the individual's measure of risk aversion, α_i, is important in calculating the expected utility of each alternative. An individual becomes an entrepreneur if the expected utility from self-employment, $U_{SE}(\theta_i, A_i, \alpha_i)$, is greater than the expected utility from wage/salary work, $U_{WS}(w_i, A_i, \alpha_i)$. Therefore, the individual's entrepreneurial ability, initial assets, potential wage in the labor market, degree of risk aversion, and possibly nonwage attributes of self-employment affect the decision to become an entrepreneur. In addition, it is important to note that (by making assumptions about the form of the utility function) the entrepreneurial decision depends on a comparison of the distribution of earnings from each alternative. An individual who is sufficiently risk averse might decide against self-employment with high average earnings (possibly due to high ability and initial assets) if those earnings are highly variable.

This theoretical model of entrepreneurship can be employed to explain part of the large variation in self-employment rates across ethnic/racial groups. Ethnic/racial groups which are comprised of individuals who possess special entrepreneurial skills, who own large amounts of capital, who have low potential wages, and who are less risk averse potentially may have high self-employment rates.[25] Several of the key determinants of self-employment in this economic theory are not easily obtained, preventing those variables from

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[25]However, if members of a group insure other members by providing financial support, then an individual-level measure of financial assets may not be an important determinant of self-employment.

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being examined. Measures of risk aversion are not readily available. Measures of assets are obtainable, but using them in a cross-section can provide misleading results. This is because high assets may be a consequence rather than a cause of self-employment.

We do observe many variables that affect both self-employment and wage/salary earnings. These variables include education, age, immigrant status and time in the country, language skills, and other individual characteristics. By altering the difference between self-employment and wage/salary earnings, these variables may affect the self-employment decision. An important determinant of differences in self-employment rates could be differences in these variables across ethnic/racial groups.

This economic model of self-employment does not provide a complete explanation for ethnic and racial differences in self-employment. Rather, it moves the question one step backward to the determination of differences in self-employment earnings across ethnic/racial groups. However, the model points out that self-employment rates and earnings are jointly determined, and understanding both processes is important. Sociological theories emphasize the distinction between disadvantages that "push" individuals into self-employment and opportunities that "pull" individuals into self-employment. Economic theories incorporate both of these elements in models of comparative advantage, and do not make a distinction between the two forces.

Versions of the economic model of choice between self-employment and wage/salary work have been estimated by several authors. Using British data, Rees and Shah (1986) estimate a version without assets and assume that everyone has the same degree of risk aversion. They provide some tests which broadly support their model, but they do not fully test the approach. Evans and Jovanovic (1989) incorporate assets into the model, but assume that they are exogenous. Several other papers examine the importance of start-up capital, but the results are mixed. Meyer (1990) argues that assets play a small role in the decision to become self-employed. However, Evans and Leighton (1989), Blanchflower and Oswald

(1990), and Holtz-Eakin, et al. (1993) in particular, find a greater importance of assets in the self-employment decision. In addition, Holtz-Eakin, et al. (1994) find a large role of assets in affecting the degree of success of businesses. These differing results have not been reconciled yet.

In the economics literature, two empirical studies of self-employment by race and ethnicity should be mentioned. The first examines the enclave theory which is more closely associated with sociology. Borjas (1986) utilizes the 1970 and 1980 Censuses and finds that self-employment rates are higher for immigrants than for native-born men within six racial categories. In addition, he discovers that more recent immigrant cohorts and persons immigrating less recently within a given cohort are more likely to be self-employed. Borjas argues that the reason immigrants have higher self-employment rates is because of their ability to provide special goods and services to co-ethnics residing in geographic enclaves: He provides evidence supporting this theory for a few Hispanic groups. He includes the fraction of the SMSA in which each individual resides that is Hispanic in an equation determining the probability of self-employment. He finds that this coefficient is positive and significant for certain groups, and concludes that this is evidence supporting the enclave effect.[26]

Borjas and Bronars (1989) examine self-employment rates and earnings for blacks, whites and Asians using the 1980 Census. They find significant differences in self-employment rates and income by race. Next, they run earnings equations with the standard selection correction based on a normally distributed error term. Their estimates suggest that the most able whites enter self-employment, while the least skilled remain in the salaried sector. Exactly the opposite is true for blacks, Hispanics, and Asians: the less able enter

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[26]The significance of the enclave variables is likely overstated because Borjas does not account for any correlation in the behavior of each group within a given SMSA. See Borjas and Sueyoshi (1991) for a discussion of the problems associated with including group specific variables in individual level equations.

self-employment. They conclude that consumer discrimination creates this difference by discouraging more able minorities from selecting self-employment. There are very few other economic studies of the racial, ethnic, or immigrant aspects of self-employment, but a good review of the economic literature on self-employment can be found in Aronson (1991).[27]

4. Data

In this paper, we use the Public Use Microdata 5-Percent Samples from the 1980 and 1990 Censuses of Population. We use these data because they have detailed race and ethnicity questions and are the only data which include enough individuals to examine a large number of ethnic/racial groups.[28] We build on the findings of many researchers who have extensively examined the Census ancestry and race questions.[29] With individual responses for nearly 12 million individuals, the Census allows us to examine many ethnic/racial groups that would be impossible with other data sets. Researchers who examine ethnicity and race with other sources must examine fewer groups or rely on much smaller numbers in each group.[30]

We analyze the subset of individuals who work in non-agricultural industries and who are at least 16 years old. In addition, we include only individuals who worked at least 20

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[27]Other papers include Fuchs (1982), Evans and Leighton (1989), and Bates (1990) which empirically analyze the factors determining who is self-employed or who leaves self-employment. See Bates (1989), Meyer (1990), and Fairlie (1994) for studies that analyze the potential causes of the low level of black self-employment.

[28]For most of the analyses, we use the 1990 Census Public Use Microdata 5-Percent Sample. We also use the 1980 5-Percent A Sample, the 1980 1/1000 A Sample, and a 1990 1/1000 sample for various comparisons and analyses.

[29]See especially Lieberson and Waters (1988) and Farley (1990). In addition, see McKenney and Cresce (1990) and Cresce, et al. (1992) for discussions of the ethnic and race questions contained in the Census.

[30]See Neidert and Farley (1985) who use the 1979 Current Population Survey, and Borjas (1992) who uses the General Social Surveys and the National Longitudinal Surveys of Youth.

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weeks in 1989 and who usually worked at least 15 hours per week in 1989.[31] As in most previous studies of self-employment, agricultural industries are removed because the process determining who becomes self-employed there is assumed to be very different from other industries. We select individuals who are currently working because we are interested in analyzing the determinants of choosing self-employment over wage/salary work. We do not want to confound this "second-stage" choice with the choice of working versus not working by including individuals who are unemployed or not in the labor force. Self-employed workers are defined as those individuals who identify themselves as self-employed in their own not incorporated business or self-employed in their own incorporated business on the class of worker question.[32] Wage/salary workers are defined as those who are not self-employed, but meet both the weeks worked per year and the usual hours worked per week criteria given above.

We create a sample from the entire 1990 Census 5-Percent Sample which contains roughly equal numbers in each ethnic/racial group.[33] This smaller sample causes us to lose some precision for the largest ethnic/racial groups, however, we still obtain fairly precise estimates for these groups. This sample includes a sufficient number of individuals from each of 60 ethnic/racial groups to allow comparisons across groups. We identify all ethnic/racial groups that have a minimum of approximately 800 observations. We then choose sampling probabilities to give approximately 5000 observations for each group if

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[31] 81.9 percent of the men and 67.2 percent of the women in our sample worked at least 40 weeks in 1989 and 35 hours per usual week in 1989. We check some of the analyses below with a full-time, full-year subsample defined in this way.

[32] Excluding the incorporated self-employed would exclude many of the more successful business owners.

[33] We also create a similar sample from the 1980 Census 5-Percent A Sample.

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there are that many in the full data set.[34] The resulting sample is utilized extensively below.

Definitions of Ethnic/Racial Groups

We identify a large number of ethnic/racial groups by interacting the ancestry, race, and Spanish origin variables in the Census.[35] In some cases we combine very specific ethnic groups, generally by geographical location.[36] The ancestry variable in the Census is created from a question in which the respondent is asked to report his or her ancestry or ethnic origin.[37] The question is open-ended, which means that the respondents write in their answers, often with more that one ancestry. This write-in response is then changed to a numeric code with double-ancestry answers receiving two separate codes. To remove the complications of assuming a dominant ancestry or analyzing the numerous permutations of dual ancestries, only individuals with a single ancestry are included in the analysis.[38]

Approximately, 15 percent of the sample wrote in a religious group, did not respond, or gave responses that are not meaningful to the analysis such as American or United States.[39] An additional 30 percent of the observations report multiple ancestries.

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[34]The individuals from groups that have less than 5000 observations are sampled with probability of one.

[35]See Appendix A for a list and description of the ethnic/racial groups that we identify.

[36]For example, the Scandinavian group includes people with Danish, Norwegian, and Swedish ancestries. The groupings are also partly the result of non-specific responses given by many people. A large number of individuals indicate an ancestry of Scandinavian without specifying further.

[37]See Appendix B for the exact wording of the question and instructions for answering it.

[38]Alternative methods for handling multiple ancestry responses and problems with these methods are described in Lieberson and Waters (1988).

[39]The following statistics are from our sample of adults who work in non-agricultural industries and who work at least 20 weeks per year and 15 hours per week.

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Therefore, we create our sample from the 3.0 million (54 percent) of the 5.6 million working adults in the 5-percent Sample who have valid single ancestry responses.

To create the numerous ethnic/racial classifications analyzed in this paper, we also utilize the race and Spanish origin questions in the Census. The race variable in the Census is created from a question in which respondents are asked to identify themselves as belonging to a specific race. The race categories on the Census questionnaire are White, Black or Negro, Indian (American), Eskimo, Aleut, Chinese, Filipino, Hawaiian, Korean, Vietnamese, Japanese, Asian Indian, Samoan, Guamanian, Other Asian or Pacific Islander, and Other Race. If a person specifies more than one race, the race of the person's mother is used, or failing this, the first race reported is used. The race of a member of the individual's household is used if there is no answer for race on the questionnaire. The Spanish origin question asks whether an individual is of Spanish/Hispanic origin or descent. The categories for Spanish origin include not of Spanish/Hispanic origin, Mexican, Puerto Rican, Cuban, and other Spanish/Hispanic.

We interact the responses to the ancestry, race and Spanish origin questions to create ethnic/racial groups. For example, we create two separate ethnic/racial groups, White and Black British, because of the large numbers of both whites and blacks who have British ancestry. The ethnic groups, South Americans, Central Americans, and individuals from the Caribbean, include large numbers of people with black or white race and/or Spanish origin. Three separate ethnic/racial groups are created from each of these original ethnic groups.[40] We combine blacks who have a Spanish origin and who do not have a Spanish origin in these three ethnic groups for two reasons. First, approximately 90 percent of the Blacks from the Caribbean and Black South Americans in our sample report not having a Spanish origin.

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[40] The subgroups are created as follows. If the individual's race is black then he/she is classified as black. If the individual's race is white or Spanish and he/she reports a Spanish origin then he/she is classified as Spanish. If the individual's race is white and he/she reports not of Spanish origin then he/she is classified as white.

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Second, the Black Central American group would be too small if we separated it by Spanish origin.

The ethnic/racial group, African-American, is comprised of those people whose race is black and ancestry is African-American. They are a separate group from Black Africans because the latter group's members are more specific about their exact origin. The Census does not include questions on religion. Therefore, we cannot identify many interesting religious groups. Although we cannot say anything about most religious groups, following previous studies using Census data, we can say something about the Jewish population by using its rough correspondence with the Russian ethnic/racial group.[41]

There are some weaknesses of the Census ancestry question. For example, people reporting "British Isles" and "British (United Kingdom)" were recorded as English, but may be Irish, Scottish or Welsh. The ancestry question asks for the group with which a person identifies, and identification may be influenced by factors other than where one's ancestors were born. Differences between true ancestry and self-identification may partly explain the somewhat differing results below for those who report race as white and ancestry as Native American and those that give both their race and ancestry as Native American.

There exists another important problem with using the ancestry question in the Census. Cresce, et al. (1992) point out that the number of individuals reporting certain ancestries is sensitive to the location of the ancestry question on the questionnaire and whether the group is listed as an example on the questionnaire. The most extreme cases are probably English and German ancestry. The number of individuals who report English ancestry decreased from 49.6 million in 1980 to 32.7 million in 1990, whereas the number of

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[41]Neidert and Farley (1985) use this approximation in an analysis of U.S. Census data. Lieberson and Waters (1988) find that there is a strong correspondence between American Jews and those with Russian ancestry. Using the NORC General Social Survey for the years 1972-85, they find that of 250 people reporting themselves as Russian, 139 were raised as Jews. This result also indicates that a substantial number of Russians are not Jews. In addition, less than half of those indicating that they were raised as Jews give their ancestry as Russian (139 out of 400).

individuals reporting German ancestry increased from 49.2 million in 1980 to 58.0 million in 1990.[42] They offer two potential explanations for these changes. First, the number of individuals reporting English ancestry is high in 1980 partly because the ancestry question is asked directly after the language question, which most individuals in the U.S. answer as English. Second, English is listed as the second example on the 1980 questionnaire and is not included as an example on the 1990 questionnaire. In contrast, German was moved from the fourth example in 1980 to the first example in 1990. Cresce, et al. (1992) refer to this as the "example effect" and identify other ancestries that exhibit this effect. However, they also point out that there are strong consistencies for most ancestry groups for the 1980 and 1990 Censuses.

Overall, the ancestry question appears to be fairly reliable. It is likely that it is most reliable for the non-European groups on which we focus much of our attention. The U.S. Census examined the consistency of responses to a question on ethnic origin found in the CPS.[43] There is a high degree of consistency of responses over time for non-Europeans. The responses of Europeans tend to differ more often than non-Europeans between surveys. Lieberson and Waters also argue that there has been a homogenization of European groups. The smaller differences among European groups that we find in the characteristics of self-employment analyzed below may be partly due to these two effects.

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[42]McKenney and Cresce (1990) find that the number of people reporting English ancestry on the 1980 Census is approximately twice the number reporting English on the 1979 CPS. Cresce, et al. (1992) find that the 1990 Census estimates for the number of Germans is similar to estimates from the 1986 National Content Test.

[43]See Lieberson and Waters (1988).

5. Self-Employment by Ethnic/Racial Group

A. Estimates from the 1990 Census

Table 1 reports estimates of male and female self-employment rates for the 60 ethnic/racial groups that we define. The estimates of male and female self-employment rates are reported for both the 1980 and 1990 samples.[44] The self-employment rates for each ethnic/racial group are estimated fairly precisely, mostly with standard errors below one percentage point. At the bottom of the table we report the male and female self-employment rates for the entire 1980 and 1990 5-Percent Samples. In 1990, the total U.S. self-employment rates for men and women are 10.8 and 5.8 percent, respectively.

Table 1 documents the substantial variation in self-employment rates across ethnic/racial groups in the U.S. For men, self-employment rates range from 3.2 percent for Laotians to 28.6 percent for Israelis. These estimates suggest that Israeli men are approximately nine times as likely to be self-employed as Laotian men. Both African-American and Black Central American women have a self-employment rate of 2.0 percent. In comparison, Korean women have a self-employment rate of 18.9 percent. It is evident that self-employment rates differ enormously for both men and women by ethnic/racial group.

Although the differences across ethnic/racial groups are quite striking, there are large differences within broad ethnic and racial groups. All of the European groups have self-employment rates near or above the U.S. rates for men and women, however, the range across these groups is large. White French, Portuguese and Belgians have the lowest self-employment rates among European groups equal to 10.5 percent for men and close to 7.0 percent for women, whereas Russians (24.9 percent for men and 12.3 percent for women) and Greeks (23.0 and 10.1 percent) have the highest self-employment rates. This implies

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[44] The estimates of ethnic/racial self-employment rates from our 1980 and 1990 samples are very similar to estimates from the entire 5-Percent Samples from which they are drawn.

that the range across all European groups is 18.1 percentage points for men (1.7 times the U.S. rate) and 7.5 percentage points for women (1.3 times the U.S. rate). It is evident that there exist large differences in self-employment rates among European groups which suggests that categories such as European or White are actually aggregations of fairly dissimilar groups. As demonstrated more clearly below, such broad groupings hide important differences in self-employment rates and industry distributions.

The Middle Eastern group which contains Lebanese, Syrians, Iranians, Iraqis, Saudi Arabians, and Palestinians has high self-employment rates (23.1 and 10.2 percent). Other ethnic/racial groups with origins in either the Middle East or neighboring countries, such as Armenians (24.1 and 9.7 percent), Israelis (28.6 and 10.3 percent), and Turks (18.6 and 8.5 percent), tend to have high self-employment rates.

Asian self-employment rates differ substantially across ancestry groups. The self-employment rates of Filipinos (5.1 and 3.3 percent) and Laotians (3.2 and 2.3 percent) are at or near the very bottom of the distribution of self-employment rates across all ethnic/racial groups, whereas the Korean rates (27.9 and 18.9 percent) are at or near the top. Large Asian groups such as Asian Indians (11.7 and 7.4 percent), Chinese (13.5 and 9.1 percent), Japanese (11.1 and 6.1 percent), and Vietnamese (8.3 and 8.7 percent) have self-employment rates that are fairly spread across the distribution. These results demonstrate that combining Asian ethnic/racial groups into one classification may be a misleading oversimplification.

There are many studies focussing on the number and success of Koreans in self-employment.[45] Min (1984) reviews previous studies on Korean entrepreneurship and states that about one-third of Korean immigrant families in the U.S. are involved in small businesses. Yu (1982) finds that in 1980, 40 percent of all employed Korean men in Los Angeles were self-employed. Our estimate of the national rate for Korean men is lower than

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[45]Light (1984), Light and Bonacich (1984), and Min (1984, 1988) are good sources of references to studies of Korean entrepreneurship.

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Yu's estimate for Los Angeles, but is still extremely high compared to other ethnic/racial groups.

The self-employment rates of men and women in Hispanic ethnic/racial groups are typically below the average U.S. rates. Mexicans (6.8 and 4.4 percent) and Puerto Ricans (3.6 and 2.3 percent) have low self-employment rates, while Cubans have moderately high self-employment rates (15.5 and 5.9 percent). There are many studies that analyze Cuban self-employment. This interest is in part generated by the success of Cuban-owned businesses, especially in Miami, Florida.[46] The Cuban self-employment rate for men is higher than the U.S. rate, however, more striking is that it is substantially higher than the self-employment rates of other Hispanic groups.

Overall, black ethnic/racial groups have the lowest self-employment rates of any broad group. African-Americans, the largest black group, have a self-employment rate of only 4.4 percent for men and 2.0 percent for women. There is a large body of research describing the dearth of black-owned businesses in the U.S.[47] Blacks from Central America (5.0 and 2.0 percent) and South America (4.4 and 2.1 percent) also have very low self-employment rates.

Black Africans (7.1 and 3.2 percent) and Blacks from the Caribbean (6.8 and 3.0 percent) have low self-employment rates compared to the U.S. rates, but have rates that are notably higher than the African-American rates. These two groups contain a much higher percentage of immigrants (56.7 and 88.3 percent, respectively) than African-Americans (0.8 percent). Thomas Sowell argues that because of the different socioeconomic backgrounds of West Indian blacks and African-Americans, the economic experiences of the two groups in

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[46] See Light (1984), Portes and Bach (1985), and Aldrich and Waldinger (1990) for references.

[47] Earlier studies include Myrdal (1944), Cayton and Drake (1946), Frazier (1957), Kinzer and Sagarin (1950), and Glazer and Moynihan (1970). Recent work includes Bates (1989), Borjas and Bronars (1989), Meyer (1990), and Fairlie (1994).

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the U.S. are very different. West Indian slaves, in contrast to American slaves, were allowed to manage their own plots of land and profit from any surplus they might produce. Therefore, West Indian immigrants were much better off economically in the U.S. As Kotkin (1986) points out West Indian immigrants were very successful in business. In 1901 they owned 20 percent of the black enterprises in Manhattan while only comprising 10 percent of the black population. Glazer and Moynihan (1970) point out that West Indian immigrants were more entrepreneurial than native blacks, but over time they have merged into the African-American group to the point where their children do not perceive themselves as being any different. Nationally, we find that Blacks from the Caribbean have higher self-employment rates than African-Americans. However, if we remove all workers who are in the taxicab service industry, we find that the Black Caribbean rate for men (5.4 percent) is only slightly higher than the African-American rate (4.4 percent).[48] Overall, our estimates suggest that are important differences in self-employment rates across the black ethnic groups. However, given the low self-employment rates of all black ethnic groups it appears as though being black, independent of ethnic origin, is an important factor in determining who is self-employed.

We create two separate ethnic/racial groups for Native Americans.[49] Both groups include people who report Native American ancestry, but who differ in their answer to the question on race. The two groups have significantly different self-employment rates. White Native Americans have higher self-employment rates (10.1 and 5.7 percent) than people who also answer Native American for race (7.2 and 4.5 percent). This result may be an example of self-identification influencing responses to the ancestry question, and a case where self-identification is associated with other individual characteristics.

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[48]The Black African self-employment rate also decreases sharply after removing the taxicab industry. This self-employment rate is equal to 5.3 percent.

[49]Native Americans include American Indians. Aleuts, and Eskimos.

In general, male and female self-employment rates have similar rankings across ethnic/racial groups. The main difference is that female self-employment rates are typically around 55 percent of male rates. This is very consistent among ethnic/racial groups. Only 4 out of the 60 groups reported in Table 1 have female/male ratios that lie outside of the range from 0.35 to 0.75. The Vietnamese are the only ethnic/racial group with a higher estimated self-employment rate for women than for men.

B. Estimates from the 1980 Census

Table 1 also reports male and female self-employment rates by ethnic/racial group from our 1980 sample. In 1980, the U.S. self-employment rate was 10.4 percent for men and 3.9 percent for women. The most striking change in self-employment rates from 1980 to 1990 is the sharp increase in the female self-employment rate.[50] This increase occurred for virtually every ethnic/racial group included in our study and was especially large for several groups.

The results reported in Table 1 demonstrate similar patterns of self-employment in 1980 and 1990. Self-employment rates ranged from a low of 1.9 percent for Laotian men to a high of 26.3 percent for Russian men. Furthermore, large differences in self-employment rates within broad ethnic/racial categories also existed in 1980. Overall, the ranking of ethnic/racial groups by self-employment rates in 1980 is very similar to 1990. A few groups that experienced a large increase in the self-employment for men from 1980 to 1990 are the Vietnamese (148 percent), Spanish from the Caribbean (87.6 percent), Slovaks (69.5 percent), and Laotians (66.5 percent). The male self-employment rate decreased from 1980 to 1990 for only a handful of groups.

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[50]Devine (1991) documents the rise in female self-employment from 1975 to 1988 and analyzes its causes.

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The large increase in the Vietnamese self-employment rate for men also occured for women. This change in the self-employment rate was predicted by the estimates from our Probit equations reported in Table 2 and similar equations estimated for 1980. The coefficient on the most recent period of immigration (capturing the last 5 years) is negative. In our 1980 sample, 85.2 percent of the Vietnamese immigrated to the U.S. within the last 5 years. However, in our 1990 sample only 9.1 percent of the Vietnamese immigrated in the last 5 years. Therefore, as the length of time in the U.S. increased for Vietnamese immigrants, the self-employment rate for this group increased.[51] It appears as though the additional time spent in the U.S. has had the expected effect on this group's participation in self-employment.

C. Adjusted Self-Employment Rates

Part of the group differences reported in the first several columns of Table 1 are undoubtedly due to differences in mean characteristics of the individuals in the groups. To account for this influence, Table 1 also reports self-employment rates that adjust for the differing individual characteristics of each ethnic/racial group, such as age, levels of education and year of immigration. There are large differences in these characteristics, particularly in levels of education and immigrant status. For example, 17 of the 60 groups are at least 80 percent immigrants, while another 23 are less than 20 percent immigrants (see Appendix B for means by ethnic/racial group).

We considered reporting ethnicity/race dummy variable coefficients from Probit equations with and without individual control variables. But such coefficients are not easily interpreted. Instead, using our sample, we estimate Probit equations which control for individual characteristics including dummy variables for each ethnic/racial group (these

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[51] The self-employment rate for the Vietnamese who immigrated to the U.S. between 1975 and 1980 is 2.6 percent in 1980 and 10.8 percent in 1990.

equations and the full list of control variables are reported in Table 2). We then calculate the predicted self-employment rates for each group using the characteristics of a representative sample of the U.S. working population (a 1/1000 sample drawn from the entire 5% Sample) and include the ethnicity/race dummy variable for that group. Since the Probit function is nonlinear, we calculate and report the mean of the function evaluated at the distribution of characteristics. The predicted self-employment rate for ethnic/race group j is

$$P_j = \frac{1}{N} \sum_{i=1}^{N} \Phi(x_i\beta + \alpha_j)$$

where β is the vector of coefficients on individual characteristics from the Probit equation estimated on the ethnicity/race weighted subsample, α_j is the coefficient on the dummy variable for ethnicity/race j, and $i = 1,...,N$ indexes the observations in the representative sample. We do these calculations separately for men and women using the Probit coefficients estimated for that sample. These average predicted probabilities of self-employment for each ethnic/racial group are reported in the last two columns of Table 1. The adjusted self-employment rates by ethnicity/race provide an estimate of the self-employment rate each ethnic/racial group would have if its levels of human capital, immigration status, regional distribution, and other personal characteristics were representative of the total U.S. working population. We calculate standard errors for several adjusted self-employment rates and find them to be approximately the same magnitude as the standard errors for the unadjusted self-employment rates.[52]

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[52]Using the delta method, the standard error of P_j is the square root of $dP_j/d\gamma_j'$ $Var(\gamma_j)$ $dP_j/d\gamma_j$, where $\gamma_j' = (\beta'\ \alpha_j')$. For ethnic/racial groups with high self-employment rates, the standard errors on the actual self-employment rates are generally slightly larger than the adjusted rate standard errors. The opposite is true for ethnic/racial groups with low self-employment rates. For example, the actual and adjusted self-employment rate standard errors are 0.809 and 0.737 for Russian men, and 0.467 and 0.481 for Mexican men.

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The range of self-employment rates from lowest to highest is smaller for the adjusted self-employment rates in Table 1. However, similar to the unadjusted self-employment rates there still is substantial variation across ethnic/racial groups. For example, the adjusted self-employment rates for men range from a low of 2.6 percent for Laotians to a high of 23.7 percent for Koreans. Even after controlling for group differences in individual variables typically used to estimate earnings equations, there are enormous differences in self-employment rates across ethnic and racial groups in the U.S. This suggests that there is a strong ethnic/racial component in determining who is self-employed, and that individual variables such as education, year of immigration, age, sex, family characteristics, and region of the country can only explain a fairly small part of the variation in self-employment rates by ethnicity/race.

Overall, the adjusted self-employment rates are very similar to the actual rates for each ethnic/racial group. For men, only 6 of the 60 groups experience at least a 20 percent change in the self-employment rate after adjusting. Among women, only 11 groups have adjusted self-employment rates that are at least 20 percent more or less than their unadjusted self-employment rates. In general, groups with above average or slightly below average unadjusted self-employment rates experience decreases in self-employment rates after adjusting, and groups with much lower than average rates experience increases. The largest change from actual to adjusted self-employment rates is for Filipinos (-31.4 percent for men and -37.1 percent for women). This result implies that the low Filipino self-employment rates are not due to a lack of measurable characteristics associated with a high self-employment rate, but are due to something else.

6. The Individual Determinants of Self-Employment

A. The Self-Employment Decision

The economic model in this paper suggests that an individual's entrepreneurial ability, initial assets, potential wage, and aversion to risk affect the decision to become self-employed. In this section, we estimate a reduced-form equation for the self-employment decision. We include variables, such as education and age, in Probit equations to partially control for some of the effects suggested by the theoretical model. In additon, an individual's potential wage in the labor market cannot be specifically estimated. Instead, we include human capital variables typically used to estimate earnings equations in our equation for the self-employment decision. In some of the specifications we also include dummy variables for each ethnic/racial group. In the next section, we estimate separate Probit equations for each ethnic/racial group, but for now we do not allow the slope coefficients to vary by ethnicity/race.

Table 2 reports the estimates of Probit equations determining who is self-employed using our sample. The dependent variable is equal to 1 if the person is self-employed and equal to 0 if the person is a wage/salary worker. The results for male and female samples with and without ethnic/racial group dummy variables are reported. We also present results for equations that include dummy variables for several industries. The important determinants of self-employment are discussed below.

Empirical studies of self-employment generally find that education is an important determinant of who is self-employed.[53] To analyze the role that education plays in the self-employment decision we model the relationship with a specification that allows for different common levels of education to have different effects on self-employment.[54] These levels

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[53]See Aronson (1991) for a reference to these studies.

[54]This specification is less restrictive than using completed years of school.

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include less than high-school (left out category), high-school graduate only, attended less than 4 years of college, and college graduate. We find that each level of education is increasingly associated with a higher probability of self-employment. This is true for both men and women and implies that education plays a positive and significant role in determining who is self-employed.

Another important determinant of self-employment is the year in which an individual immigrated to the U.S. Borjas (1986) finds that immigrants within several racial groups are more likely to be self-employed than the native born. The results presented in Table 2 support his finding. We include dummy variables for several time periods of immigration in our equations.[55] For each specification reported, most of the coefficients on periods of immigration are positive and statistically significant, except for the most recent time period, 1985 to 1990.[56] The coefficient for this period is negative and significant for each specification for men, but is positive and mainly insignificant for women. For men, the periods of immigration which have the largest coefficients are for the periods from 1970 to 1974 and from 1975 to 1979. For women, most periods of immigration have positive coefficients that are similar in magnitude, except for immigrating from 1950 to 1959, from 1980 to 1984, and from 1985 to 1990 which have positive coefficients but are smaller in magnitude. We also analyze the self-employment rates of each ethnicity/race group by year of immigration and find that this pattern is consistent across most of the ethnic/racial groups that have substantial numbers of immigrants. These results are consistent with the education credentials of the foreign born not being highly valued here, resulting in many turning to self-employment.

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[55]The left out category is native born. We use the time periods given on the Census questionnaire, and thus could not try a linear specification for year of immigration.

[56]Using the 1980 sample, we find a similar pattern in which the most recent period of immigration (1975 to 1980) is the only period of immigration that does not increase the probability of being self-employed.

Other variables in the equations reported in Table 2 are important in determining who is self-employed. The probability of self-employment increases with an individual being older, married, widowed, divorced, separated (compared to never married), having more children, or having a disability. Individuals who are military veterans have a lower probability of being self-employed. In addition, most of the variables reported have similar effects in both the male and female equations.

Controlling for ethnicity/race is important in determining self-employment. Table 2 reports Probit equations for the male and female populations with dummy variables for each ethnic/racial group. We report the coefficients for several ethnic/racial groups. These ethnic/racial coefficients are large in absolute value and are statistically significant for most of the groups reported. For the male sample, 38 of the 59 (64.4 percent) ethnic/racial dummy variables are significantly different from the omitted group at the .05 level. Controlling for ethnicity/race is also important in determining female self-employment. For the female sample, 27 of the 59 (45.8 percent) ethnic/racial dummy variables are statistically significant. The omitted group is White British which has self-employment rates of 13.4 percent for men and 7.3 percent for women (the U.S. rates are 10.8 and 5.8 percent). The ethnic/racial groups with insignificant coefficients generally have self-employment rates that are very similar to the White British rates. Likelihood ratio tests for the significance of the entire group of ethnicity/race dummies have extremely large values for both the male and female samples.

In columns (3) and (6) of Table 2 we report Probit equations for men and women that control for industry of employment. We want to determine if differences in the industry distribution of ethnic/racial groups can explain a large part of the variation in self-employment rates across ethnic/racial groups.[57] Specifically, we test whether the

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[57] It is very difficult to separate the choice of industry from the choice of self-employment. We only identify broad industry groupings to partially avoid this problem.

coefficients on our ethnic/racial dummy variables change substantially when we control for industry. It is possible that groups with high self-employment rates locate in industries that lead to self-employment. After including dummy variables for 13 industry classifications, the ethnic/racial coefficients change only slightly. While some coefficients become slightly smaller in absolute value, a substantial number of others become larger. Of the 12 ethnic/racial coefficients reported, 6 coefficients in the male sample and 7 coefficients in the female sample are smaller in absolute value after controlling for industry while the others are larger. These results suggest that any tendency of certain ethnic/racial groups to locate in specific industries which lead to self-employment is not very pronounced.

B. Probit Equations for Single Ethnic/Racial Groups

In this section we examine if the determinants of self-employment are similar for different ethnic/racial groups. Our use of a common framework to examine many ethnic/racial groups is only appropriate if different groups are affected in similar ways by explanatory variables. Furthermore, a possible explanation for the large variation in self-employment rates across ethnic/racial groups is differing effects of individual variables rather than differences in the distribution of the variables themselves. To determine if the processes generating self-employment are similar across ethnic/racial groups we estimate separate Probit equations for each individual ethnic/racial group. We only include men in this analysis because the sample sizes for women are small for a number of ethnic/racial groups. To estimate similar Probit equations for each ethnic/racial group we simplify our specification by combining possible values of certain variables and eliminating a few less important ones. We collapse the year of immigration, marital status, and regional variables into fewer categories.[58]

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[58]Since certain groups, such as African and Native Americans, have virtually no immigrants, we estimate equations without immigration variables for these groups.

The results for several ethnic/racial groups are reported in Table 3. The first thing to note is that the coefficients on age and age squared usually have the same sign and are approximately of the same magnitude for most of the ethnic/racial groups reported. Although not reported in Table 3, the coefficients on ever been married and the number of children are similar for most of the groups. These estimates are similar to those for the total sample which are reported at the bottom of the table.

The effect of education on the probability of being self-employed varies by ethnic/racial group. One method of analyzing this effect is to compare the coefficients on the college graduate dummy variable across ethnic/racial groups. Using the entire sample, the coefficient is positive and statistically significant, suggesting that having a college education increases the likelihood of being self-employed. Among the ethnic/racial groups reported in Table 3, 19 groups have positive coefficients (5 are statistically significant), while the remaining 11 groups have negative coefficients (2 are statistically significant).[59] It appears as though having a college education increases the probability of self-employment for most ethnic/racial groups.

As mentioned above, we collapse the year of immigration categories to estimate a Probit equation for each ethnic/racial group. For the total sample, immigrants from each time period have a higher probability of being self-employed than the native born. This result holds for a majority of the ethnic/racial groups reported in Table 3. Of the 27 ethnic/racial groups which consist of a significant number of immigrants, 20 (74 percent) have positive coefficients for immigrating from 1970 to 1990 and 18 (67 percent) have

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[59]Boyd (1990) finds that education has no effect on predicting self-employment among Asians. However, he combines all Asian ethnic groups into one. Table 3 demonstrates that this is a misleading finding because for some Asian groups, such as Asian Indians and Filipinos, education is an important determinant of self-employment.

positive coefficients for immigrating from 1950 to 1969.[60] Of the 23 groups reporting coefficients for immigrating to 1950, 15 (65 percent) have positive coefficients.[61] These results suggest that within most ethnic/racial groups being an immigrant increases the probability of self-employment.

Overall, the simplified equation that we use to analyze the self-employment decision provides fairly similar estimates across most ethnic/racial groups for many of the included variables. Both education and immigrant status have an important effect on the probability of being self-employed for most ethnic/racial groups. However, the sign and magnitude of these effects are not entirely consistent across ethnic/racial groups. The results from this section suggest that differences in the processes generating self-employment across ethnic/racial groups may explain part, but not a substantial amount, of the variation in self-employment rates.

C. Self-Employment and Wage/Salary Earnings Equations

The economic model presented in this paper posits that a comparison of the potential earnings from self-employment and wage/salary work is a fundamental component of the self-employment decision. Individuals may choose self-employment because it may pay better than wage/salary work. In this section we analyze the determinants of both self-employment and wage/salary earnings to identify important differences in the two sectors. In addition, a comparison of the processes determining earnings for both types of work might explain part of the variation in self-employment rates across ethnic/racial groups. For example, it is possible that ethnic/racial groups with high average self-employment earnings

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[60]For immigrating from 1970 to 1990, 9 of the positive coefficients and 0 of the negative coefficients are statistically significant. For immigrating from 1950 to 1969, the counts are 4 and 0, respectively.

[61]Four of the positive coefficients are statistically significant, whereas none of the negative coefficients are significant.

relative to average wage/salary earnings (based on a combination of observed and possibly unobserved characteristics of the ethnic/racial groups) are more likely to have high self-employment rates.

Table 4 reports results from our estimation of the log self-employment and wage/salary earnings equations for men who work full time and full year.[62] Although there are some problems with the measure of self-employment earnings found in the Census, we compare earnings in both sectors. Potential problems are that the measure partly includes a return to capital, does not include expected capital gains when selling a business, and is likely to be subject to underreporting.

Specifications 1 and 2 In Table 4 report earnings equations which are estimated by ordinary least squares (OLS). The variables included in these regressions are ones typically used in earnings equations, such as education, year of immigration, marital status, family* makeup, and regional dummies. Higher levels of education increase earnings for both self-employed and wage/salary workers, but have a stronger effect on the earnings of the self-employed. In particular, the return to a college education is much larger for a self-employed worker than a wage/salary worker. The three most recent periods of immigration have a negative effect on earnings in both sectors. Age, being married, widowed, divorced or separated, and the number of children increase earnings in both sectors, whereas having a problem speaking English or being a veteran decrease earnings. In addition to these variables, we include dummy variables for each ethnic/racial group. Although the coefficients are different in the two equations for most groups, the signs are quite similar. Of the 12 groups reported, all of the coefficients have the same sign in the log self-employment and wage/salary earnings equations. However, many of the coefficients in the

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[62]We do not analyze women who work full time and full year because the sample sizes within some of the ethnic/racial groups are small.

log self-employment earnings equations are insignificant due to the small numbers of self-employed for each group.

Similar to Rees and Shah (1986) and Borjas and Bronars (1989), we estimate corrections for possible selection bias occurring in the self-employment and wage/salary earnings equations. OLS yields inconsistent estimates of the earnings equations for self-employed and wage/salary workers if, as theorized, these workers select their type of work by choosing the sector with the highest potential earnings. For example, if workers choose self-employment because of higher earnings in this sector, perhaps due to an unmeasurable comparative advantage, then the sample for which we estimate the self-employment earnings equation is non-random and likely has higher than average self-employment earnings. The predicted self-employment earnings for an individual who is not currently self-employed using this equation are potentially misleading. To correct for selection we estimate both the log self-employment and wage/salary earnings equations by using Heckman's 2-step estimator. These equations are reported as Specifications 3 and 4 in Table 4. We provide estimates with and without this adjustment to see if both methods point to similar conclusions. While selection is likely to be important, we are not completely comfortable estimating the model assuming normally distributed errors and without exclusion restrictions. While the assumption of normality could be relaxed, there are no obvious candidates for exclusion restrictions for our model. The Census does not contain any variables that clearly affect the self-employment decision, but do not affect earnings in the two sectors.

The coefficients on most of the variables included in our self-employment earnings equation are fairly similar after correcting for selection. The coefficients on the education dummy variables are very similar to the results using OLS. However, the coefficients on the immigrant status variables are generally larger in magnitude. The coefficients on the ethnic/racial dummy variables are generally the same sign, but are much larger in absolute value after correcting for selection. All of the 12 groups reported have larger coefficients in

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absolute value after controlling for selection. The coefficient on the inverse Mills' ratio variable is positive, although not statistically significant at the .05 level.

In the log wage/salary earnings equation correcting for selectivity bias does not change the estimates for the individual variables substantially for men. However, most of the coefficients for the ethnic/racial groups become smaller in absolute value with the selection correction. The coefficient on the selectivity variable is statistically significant and indicates positive selection into the wage/salary sector.

There are important similarities and differences between the results for the self-employed and wage/salary sectors. The substantially larger return to education in determining log self-employment earnings is an important finding from this analysis. There is some evidence of positive selection by individuals into wage/salary work, however it is less clear if there is positive selection into self-employment. Controlling for selectivity appears to have some important consequences when estimating log earnings in both sectors.

7. Explaining the Ethnic/Racial Group Dummy Variables

Ethnic/racial dummy variables are included in each of the log self-employment and wage/salary earnings equations reported in Table 4. The coefficients on these variables provide an estimate of the effect that belonging to a given ethnic/racial group has on earnings in the two sectors which is not captured by the included individual level variables. A comparison of these ethnic/racial group coefficients may offer an explanation for differing rates of self-employment. After controlling for different levels of education and other individual characteristics, individuals belonging to ethnic/racial groups that have high average self-employment earnings relative to wage/salary earnings should be more likely to choose self-employment. We can test this part of the economic model of self-employment by first calculating the difference between the ethnic/racial group coefficients from the log self-employment and wage/salary earnings equations. Next, we analyze the relationship between

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these differences and the ethnic/racial dummy coefficients from a Probit equation determining the probability of self-employment. Figure 1 provides two graphs of this relationship for men who work full time and full year. The first graph uses coefficients from the log earnings equations estimated with OLS. The second graph uses coefficients from the selection corrected regressions. There appears to be a weak positive relationship between the Probit coefficients and the difference between the log earnings coefficients from OLS and a strong relationship between the Probit coefficients and the coefficients from the selection corrected regressions.

A further test of this relationship is provided in Tables 5A and 5B. We report the results of several regressions in which the dependent variable is the ethnic/racial coefficient from a Probit equation for the probability of self-employment. Table 5A examines all 59 ethnic/racial groups, while Table 5B uses only the 47 groups that have the most precisely measured log earnings coefficients.[63] These equations provide a test of the strength of the relationship between the likelihood of self-employment and the difference between self-employment earnings and wage/salary earnings across ethnic/racial groups. In addition, we examine the relationship between the Probit ethnic/racial coefficients and ethnic/racial coefficients from regressions determining log self-employment earnings, log wage/salary earnings, and log unearned income.

Both OLS and weighted least squares (WLS) are used to estimate the relationship between the Probit ethnic/racial coefficients and the log earnings coefficients.[64]

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[63]More precisely, we include only the groups with the lowest standard errors for the difference between the coefficients from the log self-employment and wage/salary earnings equations. We find clear break points in the distributions of standard errors, and thus only include the 47 groups with standard errors below these break points.

[64]We regress the squared residuals from OLS on a constant and the standard errors squared for the ethnic/racial dummy coefficients from the Probit equation and use the predicted values from this regression as weights in weighted least squares. This method puts more weight on coefficients from ethnic/racial groups that have more precisely estimated self-employment coefficients.

Specifications 1 and 2 in both tables report the results from using OLS to estimate the ethnic/racial log earnings coefficients, and Specifications 3 and 4 report the results from using coefficients from the regressions with the selection correction. We find that the difference in log earnings coefficients is self-employment and wage/salary work from OLS is important in determining the ethnic/racial dummy coefficients from the Probit model. The coefficient on this variable is positive and statistically significant in nearly all of the second stage regressions which include coefficients from the log earnings equation estimated with OLS.[65]

The comparative advantage model of self-employment implies that positive selection into self-employment is likely. Given positive selection, the estimated coefficient on the log earnings difference without the selection correction is biased downward. The equations that use the log earnings differences estimated with the selection correction indicate a very strong relationship between the difference in earnings coefficients and the Probit coefficients. There is a positive and statistically significant relationship between the two variables in every equation that uses estimates from the earnings equations with the selection correction.

The results in these tables provide evidence supporting the hypothesis that ethnic/racial groups experiencing high average self-employment earnings relative to wage/salary earnings have high self-employment rates. Evidence from both our OLS and selection corrected log earnings regressions suggests that factors increasing returns to self-employment relative to wage/salary work for certain ethnic/racial groups have a positive effect on self-employment rates for these groups. In addition, unmeasured factors which influence the returns to self-employment relative to wage/salary work for ethnic/racial groups have important effects on the self-employment decision of members of these ethnic/racial groups.

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[65]These coefficients are statistically significant at the .05 level, except for the coefficient in Specification 1 in Table 5A which is nearly significant.

Tables 5A and 5B report the results of several other bivariate regressions in which the ethnic/racial coefficients from different equations are the explanatory variable. As before, the dependent variable is the ethnic/racial coefficient from a Probit equation for the probability of self-employment. There is a significant and positive relationship between the ethnic/racial coefficients from log self-employment earnings equations and the Probit coefficients in all of the equations. The coefficients for the equations which include the log wage/salary earnings coefficients estimated by OLS as the independent variable are positive and significant, while those estimated with the selection correction are small and insignificant. There also appears to be a strong positive relationship between the coefficients from the log unearned income regressions and the Probit coefficients[66] The results of these three sets of equations suggest that factors which increase an ethnic/racial group's average self-employment earnings, wage/salary earnings, and unearned income tend to increase the likelihood that members of this group are self-employed.

The final set of equations reported in both Table 5A and Table 5B include all three variables in one equation. Generally, the coefficients on the various types of earnings are statistically insignificant in the equations using estimates from OLS. In the selectivity corrected equations, we find a positive and significant coefficient for log self-employment earnings and a negative and significant coefficient for log wage/salary earnings. This result supports the earlier finding that the difference between the two log earnings coefficients is a positive and significant determinant of the Probit coefficients. In addition, the coefficient on unearned income is positive and statistically significant. This last result is consistent with liquidity constraints and with group assets being an important determinamt of ethnic/racial self-employment rates. However, we cannot be confident that groups with high average levels of unearned income are more likely to choose self-employment. The observed

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[66]The log unearned income equation is estimated using only the wage/salary sample.

relationship may only represent the fact that groups with high self-employment rates accumulate more assets.

Using our sample from the 1980 Census, we estimate Probit equations determining the probability of self-employment and log earnings equations for each type of work. Utilizing the ethnic/racial coefficients from these equations we estimate the same second stage regressions as we do with 1990 data. The estimates from these second stage regressions are reported in Table 5C.[67] The findings from the 1980 sample when we use coefficients from OLS are notably different. The relationship between the Probit coefficients and the difference between the self-employment and wage/salary log earnings coefficients is not as pronounced. The coefficients on the variable measuring the difference in earnings' coefficients are both positive, but statistically insignificant.[68] Although the difference in the OLS estimated earnings' coefficients do not have a strong relationship with the Probit coefficients, the difference in the selectivity corrected earnings regressions has a strong positive relationship with the Probit coefficients using the 1980 Census. In both Specification 3 and 4 the coefficient on the variable measuring the difference in the selectivity corrected earnings regressions is positive and statistically significant.

The results from this section demonstrate that the method chosen for estimating log self-employment and wage/salary earnings equations has an effect on the strength of the relationship between the difference in the ethnic/racial coefficients from these equations and the Probit coefficients. Using data from the 1990 Census, our estimates from the selectivity corrected and OLS log earnings regressions suggest that ethnic/racial groups with high average self-employment earnings relative to wage/salary earnings have high self-employment

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[67]For the 1980 analysis, we include fewer ethnic/racial groups because of small sample sizes for some of the groups included in 1990.

[68]Although not reported, we estimate the same equations using a smaller number of ethnic/racial groups (N=40) with the most precisely measured values for the independent variable. The same variable is negative and statistically insignificant in two comparable specifications.

rates. Differences in relative earnings in each sector explain a substantial part of the variation in self-employment rates across ethnic/racial groups. Using data from the 1980 Census, our results from using OLS regressions provide (at best) weak evidence for this explanation, while our results from using selectivity corrected regressions provide strong evidence for this explanation.

8. Ethnic/Racial Industry Distributions of the Self-Employed

An analysis of ethnic and racial self-employment is not complete without examining the industry distribution of the self-employed in each ethnic/racial group. There is substantial variation in the types of businesses owned by different ethnic/racial groups. Based on public perceptions we expect to find an overrepresentation of Greeks and Chinese among restaurant owners, and Koreans among small grocery store owners. The patterns may indicate that individuals learn about specific industries from co-ethnics.

We examine the industry distribution for the self-employed in each ethnic/racial group at the 2-digit Standard Industrial Classification (SIC) level using our sample from the 1990 Census. After analyzing these distributions we choose several industries that provide substantial variation across ethnic/racial groups and/or represent interesting types of businesses. Table 6 reports the percent of the self-employed in several 2-digit SIC's for selected ethnic/racial groups.[69] For the same reasons as stated above, only self-employed men are included in this table. In addition, Table 6 reports an estimate of the overall industry distribution of the self-employed in the U.S. from a 1/1000 sample drawn from the entire 1990 Census 5% Sample.

European ethnic/racial groups generally have industry distributions similar to those of the total U.S. population, but Russians, Greeks, Italians, Poles are four exceptions. Russians

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[69]The 2-digit SIC's that we report account for approximately 45 percent of the total number of self-employed men in the U.S.

are underrepresented in most of the industries examined, especially in general building construction (5.5 percent compared to 20.3 percent for the U.S.). They are overrepresented in the professional industries which include health services (17.0 percent compared to 6.1 percent for the U.S.), and legal, engineering and accounting services (22.4 compared to 9.2 percent for the U.S.). Russians appear to concentrate in very profitable industries, which accounts for the Russian group having the highest average log self-employment earnings of any ethnic/racial group (see Appendix B). Poles also concentrate in the professional industries with 14.8 percent in health services and 12.9 percent in legal, engineering and accounting services. Most European groups own fewer eating and drinking places than the average for the U.S. A major exception to this finding is that Greeks have the second highest concentration of any ethnic/racial group in the eating and drinking places industry (24.6 percent compared to 2.9 percent for the U.S.). Italians are also overrepresented in this industry (5.8 percent) and in personal services (8.2 percent compared to 2.7 percent for the U.S.).[70]

Asian ethnic/racial groups disproportionately locate in food stores, eating and drinking places, and health services. However, there are important differences in industry distributions across Asian groups. Koreans are overrepresented in miscellaneous retail stores (11.1 percent compared to 5.2 percent for the U.S.), food stores (11.9 percent compared to 2.1 percent for the U.S.), and personal services (13.2 percent). These rates are either the first or second highest concentration in each of these industries for any ethnic/racial group reported in Table 6. The Chinese (25.7 percent) and the Vietnamese (15.0 percent) have the first and third highest concentrations in eating and drinking places. The Japanese have the highest concentration in horticultural services (16.5 percent compared to 3.2 percent for the U.S.) Asian Indians (31.2 percent), Filipinos (29.4 percent), and Japanese (14.6 percent)

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[70]Personal services include laundry services, beauty shops, barber shops, shoe repair shops, and other personal services.

have three of the highest concentrations in health services. In addition, Asian Indians are overrepresented in local transit (4.5 percent compared to 0.6 percent for the U.S.) and food stores (8.9 percent).[71] These results demonstrate that Asian ethnic groups own very different types of businesses not only from the U.S. average, but from other Asian ethnic groups.

The self-employed from the Middle East own large numbers of food stores (9.7 percent), miscellaneous retail stores (9.8 percent), and eating and drinking places (7.9 percent). Native Americans have industry distributions similar to the U.S. distribution, except that they are overrepresented in general building construction (32.4 percent).

Hispanic ethnic/racial groups are generally underrepresented in legal, engineering and accounting services and are generally overrepresented in eating and drinking places. Puerto Ricans have high concentrations in food stores (7.8 percent) and miscellaneous retail storés (13.5 percent). Mexicans have high concentrations in general building construction (27.3 percent), horticultural services (11.7 percent), and auto repair services (10.7 percent compared to 3.5 percent for the U.S.). Cubans have an industry distribution that is very similar to the U.S. total. This supports previous research suggesting that Cuban business owners have been successful at moving into most niches of the U.S. economy.

Overall, black ethnic groups are underrepresented in the more profitable professional industries. This partly explains why black ethnic groups tend to have low average self-employment earnings. African-Americans have a different industry distribution than Black Africans and Blacks from the Caribbean. African-Americans have higher concentrations in eating and drinking places (4.3 percent), personal services (2.9 percent), and auto repair (6.5 percent) than these two groups. Black Africans and Blacks from the Caribbean have two of the highest concentrations in local and interurban transit (29.0 and 23.8 percent, respectively), which are substantially higher than for African-Americans (1.8 percent). As

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[71]Interurban transit includes bus, urban transit, and taxicab services.

mentioned in Section 5, the high concentrations of Black Africans and Blacks from the Caribbean in this industry account for much of their higher self-employment rates than African-Americans. It is evident, that there are important differences in the industry distributions of black ethnic groups.

Analyzing the industry distributions of the self-employed across ethnic/racial groups provides another example of the importance of ethnicity and race in studying self-employment in the U.S. Not only is there large variation in self-employment rates across ethnic/racial groups, but there is large variation in the industries in which each group concentrates. This is consistent with individuals of the same ethnicity and race clustering in certain industries because they have learned the skills to run a particular kind of business from a co-ethnic. In addition, it is important to note that even within broad ethnic groups there are major differences in the industry distributions of the self-employed.

9. Home Country Self-Employment Rates

In this section, we explore another possible explanation for the differences in self-employment rates by ethnic/racial group in the U.S. The large variation in self-employment rates across ethnic/racial groups may be due to the fact that immigrants from different countries have different levels of entrepreneurial skills. Immigrants from countries in which owning a business is more common may possess skills that enable them to more easily start and run businesses in the U.S. Yuengert (1989) tests this hypothesis by including a variable which measures the self-employment rate of an individual's home country in a micro-level equation determining who is self-employed. He finds evidence that an individual's home country self-employment rate has a positive and statistically significant effect on the probability of being self-employed. However, the significance of his result is likely

overstated because he does not allow for a group level component of the error term in his individual level equations.[72]

We take a different approach by examining the relationship between an ethnic/racial group's self-employment rate in the U.S. and the group's home country self-employment rate. Cross country comparisons of self-employment rates are difficult to make, in part because self-employment is defined in different ways in each country. With this in mind, we examine self-employment rates for 41 countries published by the International Labour Office (ILO) for 1970 or the closest year available. These self-employment rates are for male nonagricultural workers. We combine some of the countries and link them to the ethnic/racial groups we define.[73] Our final sample includes self-employment rates in the U.S. and home country for 32 ethnic/racial groups.[74]

Table 7 reports the results from several regressions in which the self-employment rate in the U.S. or the ethnicity/race coefficient from the Probit equation in Table 2 is the dependent variable and the self-employment rate of the home country is the independent variable.[75] The coefficient on the home country self-employment rate is statistically insignificant and of a small magnitude in each of the equations. For example, the largest reported coefficient in which the self-employment rate of the ethnic/racial group in the U.S. is the dependent variable implies that by increasing the average home country self-employment rate from 16.0 to 17.0 percent, the average self-employment rate in the U.S. only increases from 13.2 to 13.4 percent. The largest coefficient in which the ethnic/racial

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[72]See Borjas and Sueyoshi (1991).

[73]Many ethnic/racial groups are excluded from this analysis either because they are native to the U.S. or data on self-employment rates are not available for their home countries.

[74]We also try a subsample of 25 ethnic/racial groups that excludes Communist countries.

[75]The Probit coefficients provide a measure of each ethnic/racial group's self-employment rate after removing the effects of group differences in individual characteristics, such as level of education and immigration patterns.

Probit coefficient is the dependent variable implies an elasticity equal to 0.08 percent. These results suggest that the self-employment rate of an ethnic/racial group's home country is not a major determinant of the group's self-employment rate in the U.S. Therefore, we do not find evidence that immigrants from countries with a tradition of small business ownership are at an advantage in becoming self-employed in the U.S.

10. Conclusions

In reviewing the sociological and economic literature we find that there is much speculation and anecdotal evidence about the ethnic and racial character of self-employment. In addition, there exist many good studies focussing on individual ethnic groups. However, in this paper we contribute to this area of research by analyzing a large number of ethnic/racial groups with the same nationally representative data set.

Utilizing data from the 1980 and 1990 Censuses, we provide evidence that self-employment rates differ substantially across ethnic/racial groups in the U.S. The variation in self-employment rates across ethnic/racial groups exists for both men and women. Within broad combinations of ethnic/racial groups such as Europeans, Asians, blacks, and Hispanics we find substantial variation in self-employment rates.

Our estimation of the process determining who is self-employed provides interesting results. Education and year of immigration are found to be major determinants of self-employment. Adding ethnic/racial dummy variables to the Probit equation greatly increases its explanatory power. This result suggests that accounting for ethnicity and race is important in analyzing self-employment. The adjusted self-employment rates provide further evidence that ethnicity and race are important determinants of self-employment. Overall, most adjusted self-employment rates for ethnic/racial groups are similar to the unadjusted rates. However, we do find a few interesting exceptions.

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Although there exist large differences in self-employment rates across ethnic/racial groups, the processes determining self-employment by ethnic/racial group are very similar. We find roughly similar effects of education, age, and to a lesser extent, year of immigration on the likelihood of self-employment for most ethnic/racial groups.

Overall, ethnic/racial groups differ sharply in the industries in which they congregate. Europeans tend to concentrate in similar industries, with a few exceptions. We find very different distributions across industries for Asian, black, and Hispanic ethnic/racial groups. By aggregating ethnic/racial groups into broad categories, such as Asians, blacks and Hispanics, researchers are losing important information about the ethnic and racial character of self-employment.

We analyze the model of choice of self-employment or wage/salary work based on a comparison of potential earnings in each sector. Both OLS and Heckman's 2-step estimator are used to estimate log self-employment and wage/salary earnings equations. Our results provide evidence of positive selectivity into wage/salary work, and weak evidence of positive selectivity into self-employment. By using the ethnic/racial group coefficients from both log earnings equations and the Probit equation, we find that an ethnic/racial group's average self-employment earnings relative to average wage/salary earnings appear to be important in determining the self-employment rate of that ethnic/racial group.

Future research on ethnic and racial entrepreneurship needs to analyze the processes determining self-employment and wage/salary earnings by ethnicity and race. By analyzing the factors that allow certain ethnic/racial groups to reap high returns in self-employment relative to wage/salary work, we can learn something about the factors that affect ethnic/racial self-employment rates.

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Table 1
Self-Employment Rates and Regression Adjusted Self-Employment Rates by Ethnicity/Race and Sex
1980 and 1990 Census

| Ethnicity/Race | 1990 Sample Self-Employment Rates | | | | 1980 Sample Self-Employment Rates | | | | 1990 Sample Regression Adjusted Self-Employment Rates | |
| | Male | | Female | | Male | | Female | | Male | Female |
	(%)	(S.E.)	(%)	(S.E.)	(%)	(S.E.)	(%)	(S.E.)	(%)	(%)
Israeli	28.6	(1.581)	10.3	(1.469)	23.0	(1.865)	9.8	(1.834)	23.5	9.9
Korean	27.9	(0.891)	18.9	(0.772)	22.9	(0.791)	9.5	(0.544)	23.7	14.7
Russian	24.9	(0.809)	12.3	(0.709)	26.3	(0.731)	7.8	(0.545)	21.4	11.3
Armenian	24.1	(0.801)	9.7	(0.667)	21.5	(0.869)	5.3	(0.596)	20.1	8.1
Middle Eastern	23.1	(0.727)	10.2	(0.749)	21.6	(0.637)	7.9	(0.610)	20.3	9.2
Greek	23.0	(0.761)	10.1	(0.681)	22.2	(0.640)	6.8	(0.517)	20.9	9.7
Rumanian	18.7	(0.820)	8.8	(0.738)	21.8	(0.901)	7.3	(0.743)	16.0	7.2
Turkish	18.6	(1.359)	8.5	(1.439)	18.5	(1.559)	5.6	(1.364)	17.0	7.3
Latvian	17.1	(1.412)	8.3	(1.208)	16.3	(1.257)	4.3	(0.854)	13.7	6.9
Swiss	17.0	(0.668)	9.3	(0.667)	16.3	(0.645)	7.1	(0.593)	15.2	8.4
White African	16.1	(0.882)	9.2	(1.092)	12.2	(1.118)	2.9	(0.862)	13.3	7.3
Cuban	15.5	(0.679)	5.9	(0.502)	13.1	(0.544)	3.9	(0.363)	12.0	4.5
Italian	15.2	(0.686)	5.8	(0.514)	14.1	(0.558)	4.2	(0.404)	14.5	6.3
Canadian	14.8	(0.671)	7.0	(0.545)	11.2	(0.598)	4.0	(0.452)	12.6	6.1
Lithuanian	14.7	(0.655)	7.4	(0.581)	14.8	(0.616)	4.5	(0.447)	13.3	7.3
Hungarian	13.6	(0.629)	7.1	(0.576)	14.9	(0.656)	6.0	(0.556)	12.3	6.8
Southwest Asian	13.6	(0.878)	8.8	(1.245)	10.8	(1.159)	5.1	(1.326)	11.1	7.2
Chinese	13.5	(0.649)	9.1	(0.601)	13.2	(0.568)	5.2	(0.429)	10.6	6.8
White British	13.4	(0.634)	7.3	(0.579)	12.2	(0.525)	5.0	(0.438)	12.1	6.6
Scandinavian	13.2	(0.638)	6.1	(0.511)	14.3	(0.650)	5.2	(0.514)	13.2	6.3
Ukrainian	13.1	(0.623)	6.2	(0.539)	11.8	(0.608)	4.1	(0.475)	12.0	6.2
Yugoslavian	12.8	(0.618)	5.9	(0.521)	9.7	(0.515)	4.2	(0.456)	12.0	5.8
Czechoslovakian	12.4	(0.614)	6.0	(0.511)	11.4	(0.602)	4.3	(0.490)	12.4	6.0
Dutch	12.3	(0.615)	6.2	(0.529)	12.6	(0.596)	4.2	(0.461)	12.4	6.0
Thai	12.2	(1.096)	8.7	(0.826)	13.1	(1.693)	4.0	(0.809)	9.7	5.8
Scottish	12.1	(0.575)	8.5	(0.659)	11.9	(0.555)	4.4	(0.491)	11.2	7.7
White South Am.	11.9	(1.499)	8.7	(1.486)	11.8	(2.310)	8.7	(2.297)	12.6	8.9
Spaniard	11.9	(0.596)	6.1	(0.524)	11.8	(1.024)	4.0	(0.778)	9.6	4.9
Asian Indian	11.7	(0.574)	7.4	(0.611)	9.9	(1.210)	4.7	(0.927)	9.3	5.8
Finnish	11.4	(0.598)	6.9	(0.545)	9.4	(0.510)	4.4	(0.450)	11.2	6.3
Spanish South Am.	11.3	(0.596)	7.4	(0.562)	8.3	(0.539)	3.0	(0.388)	10.6	6.5
White German	11.2	(0.583)	6.2	(0.528)	11.7	(0.518)	4.9	(0.438)	12.0	6.6
Japanese	11.1	(0.622)	6.1	(0.487)	13.4	(0.589)	5.4	(0.405)	10.1	4.5
Slovak	11.0	(0.588)	5.4	(0.497)	6.5	(0.461)	2.6	(0.364)	10.6	5.4
Polish	10.7	(0.593)	4.8	(0.461)	9.9	(0.572)	4.2	(0.469)	10.3	5.1

(Continued)

Table 1 (Continued)

Ethnicity/Race	1990 Sample Self-Employment Rates Male (%)	(S.E.)	Female (%)	(S.E.)	1980 Sample Self-Employment Rates Male (%)	(S.E.)	Female (%)	1990 Sample Regression Adjusted Self-Employment Rates Male (%)	(S.E.)	Female (%)
Irish	10.6	(0.594)	5.9	(0.506)	10.3	(0.499)	2.9	10.5	(0.338)	5.9
Oceania	10.6	(1.438)	6.1	(1.317)	12.6	(1.777)	6.5	9.5	(1.621)	5.3
White French	10.5	(0.580)	7.6	(0.563)	10.7	(0.592)	4.6	10.8	(0.477)	7.4
Portuguese	10.5	(0.579)	6.3	(0.514)	7.8	(0.457)	3.0	9.5	(0.336)	5.7
Belgian	10.5	(0.672)	7.1	(0.683)	10.9	(0.750)	5.7	11.0	(0.728)	7.3
White Native Am.	10.1	(0.563)	5.7	(0.491)	9.4	(0.542)	4.1	10.9	(0.465)	5.9
French Canadian	10.1	(0.559)	5.2	(0.487)	9.0	(0.519)	3.0	10.3	(0.389)	5.9
Spanish Caribbean	8.9	(0.549)	4.1	(0.413)	4.8	(0.580)	1.7	8.7	(0.395)	4.3
Vietnamese	8.3	(0.505)	8.7	(0.629)	3.3	(0.413)	3.3	7.3	(0.477)	6.6
Native American	7.2	(0.493)	4.5	(0.421)	6.3	(0.456)	3.0	8.0	(0.372)	4.1
Spanish	7.2	(0.491)	5.5	(0.478)	7.9	(0.448)	3.1	7.4	(0.340)	5.2
Black African	7.1	(0.467)	3.2	(0.401)	4.9	(0.436)	1.0	6.8	(0.249)	3.3
Black Caribbean	6.8	(0.504)	3.0	(0.335)	4.8	(0.397)	1.1	5.7	(0.184)	3.0
Mexican	6.8	(0.467)	4.4	(0.478)	4.7	(0.326)	1.9	6.7	(0.272)	3.9
Black British	6.1	(1.166)	2.9	(0.822)	4.0	(0.414)	1.9	6.2	(0.299)	2.6
Hawaiian	6.1	(0.581)	4.6	(0.552)	4.6	(0.624)	3.0	6.2	(0.557)	4.3
Pacific Islander	5.9	(0.644)	3.6	(0.580)	4.7	(0.870)	0.5	5.0	(0.356)	2.9
Other South Asian	5.7	(0.692)	4.8	(0.716)	5.1	(1.436)	0.8	4.8	(0.803)	4.3
Spanish Central Am.	5.5	(0.425)	4.6	(0.459)	5.8	(0.458)	2.5	5.9	(0.340)	4.1
Filipino	5.1	(0.466)	3.3	(0.346)	3.4	(0.769)	2.3	3.5	(0.645)	2.1
Black Central Am.	5.0	(0.947)	2.0	(0.593)	5.6	(1.131)	0.5	4.5	(0.341)	1.5
Black South Am.	4.4	(0.810)	2.1	(0.530)	4.5	(1.232)	1.9	4.3	(0.770)	2.3
African-American	4.4	(0.440)	2.0	(0.281)	4.3	(0.363)	1.3	4.5	(0.209)	2.4
Puerto Rican	3.6	(0.348)	2.3	(0.317)	3.5	(0.284)	2.0	4.0	(0.280)	3.0
Laotian	3.2	(0.494)	2.3	(0.512)	1.9	(0.957)	0.0	2.6	(0.000)	1.9
U.S. Total	10.8	(0.018)	5.8	(0.015)	10.4	(0.019)	3.9		(0.014)	

Notes: (1) The sample consists of non-agricultural workers who are at least 16 years old and who work 20 or more weeks per year and 15 or more hours per week. (2) The self-employment rate is the percentage of all those working who are self-employed. (3) All self-employment rates for 1990 are calculated using weights provided by the Census. (4) The adjusted self-employment rates control for differences across ethnic/racial groups in the values of the variables listed in Table 2. These rates are estimated using a 1/1000 sample which has a sample size of 60,238 for men and 49,207 for women. (5) The standard errors of the adjusted self-employment rates tend to be of a similar magnitude to those of the actual self-employment rates (see the text for more detail).

Table 2
Probit Equations for Self-Employment
1990 Census

| | Specification | | | | | |
| Explanatory Variables | Men | | | Women | | |
	(1)	(2)	(3)	(4)	(5)	(6)
Ethnic/Racial Dummies	No	Yes	Yes	No	Yes	Yes
Industry Dummies	No	No	Yes	No	No	Yes
High School Graduate	0.0530 (0.0143)	0.0002 (0.0147)	0.0219 (0.0152)	0.0456 (0.0195)	-0.0038 (0.0199)	0.0172 (0.0205)
Some College	0.1015 (0.0142)	0.0280 (0.0148)	0.0629 (0.0153)	0.0862 (0.0198)	0.0341 (0.0203)	0.0911 (0.0211)
College Graduate	0.1915 (0.0136)	0.0595 (0.0146)	0.1178 (0.0159)	0.1657 (0.0203)	0.0782 (0.0213)	0.1902 (0.0226)
Immigrated 1985 to 1990	-0.1838 (0.0207)	-0.1383 (0.0238)	-0.1635 (0.0244)	0.0453 (0.0283)	0.0710 (0.0325)	0.0253 (0.0332)
Immigrated 1980 to 1984	-0.0092 (0.0170)	0.0744 (0.0209)	0.0629 (0.0214)	0.0538 (0.0243)	0.0796 (0.0295)	0.0417 (0.0304)
Immigrated 1975 to 1979	0.0869 (0.0176)	0.1328 (0.0212)	0.1340 (0.0218)	0.1359 (0.0236)	0.1176 (0.0289)	0.0974 (0.0297)
Immigrated 1970 to 1974	0.1101 (0.0194)	0.1553 (0.0225)	0.1587 (0.0231)	0.1337 (0.0250)	0.1408 (0.0298)	0.1261 (0.0306)
Immigrated 1965 to 1969	0.0221 (0.0217)	0.0886 (0.0241)	0.1051 (0.0248)	0.0765 (0.0284)	0.1327 (0.0314)	0.1302 (0.0324)
Immigrated 1960 to 1964	-0.0056 (0.0256)	0.0584 (0.0277)	0.0743 (0.0284)	0.0613 (0.0338)	0.1176 (0.0362)	0.1079 (0.0372)
Immigrated 1950 to 1959	0.0080 (0.0244)	0.0509 (0.0257)	0.0690 (0.0265)	0.0410 (0.0341)	0.0723 (0.0357)	0.0619 (0.0367)
Immigrated Before 1950	0.0557 (0.0355)	0.1028 (0.0365)	0.1087 (0.0374)	0.0917 (0.0518)	0.1018 (0.0530)	0.0980 (0.0544)
Problem Speaking English	-0.0790 (0.0194)	-0.0750 (0.0207)	-0.0746 (0.0213)	0.0488 (0.0250)	0.0083 (0.0266)	0.0169 (0.0275)

(Continued)

Table 2 (Continued)

Explanatory Variables	Men				Women	
	(1)	(2)	(3)	(4)	(5)	(6)
Age	0.0505 (0.0023)	0.0504 (0.0023)	0.0573 (0.0024)	0.0417 (0.0031)	0.0418 (0.0031)	0.0498 (0.0032)
Age Squared/100	-0.0337 (0.0024)	-0.0353 (0.0025)	-0.0422 (0.0025)	-0.0318 (0.0034)	-0.0323 (0.0034)	-0.0402 (0.0035)
Currently Married	0.1937 (0.0150)	0.1661 (0.0154)	0.2036 (0.0158)	0.2661 (0.0206)	0.2172 (0.0211)	0.2315 (0.0217)
Widowed	0.1576 (0.0467)	0.1532 (0.0472)	0.1810 (0.0484)	0.1298 (0.0358)	0.0917 (0.0364)	0.0936 (0.0373)
Divorced	0.1046 (0.0218)	0.0990 (0.0222)	0.1032 (0.0228)	0.0820 (0.0271)	0.0621 (0.0276)	0.0662 (0.0284)
Currently Separated	0.0367 (0.0354)	0.0934 (0.0361)	0.0949 (0.0372)	0.0044 (0.0430)	0.0378 (0.0438)	0.0160 (0.0451)
Children	0.0198 (0.0041)	0.0392 (0.0042)	0.0388 (0.0044)	0.0186 (0.0059)	0.0428 (0.0061)	0.0461 (0.0063)
Limiting Disability	0.0283 (0.0204)	0.0306 (0.0207)	0.0220 (0.0213)	0.0653 (0.0309)	0.0664 (0.0313)	0.0532 (0.0320)
Veteran of Military	-0.1975 (0.0115)	-0.1733 (0.0117)	-0.1409 (0.0122)	-0.1317 (0.0569)	-0.0922 (0.0576)	0.0190 (0.0607)
Greek		0.3690 (0.0397)	0.2945 (0.0409)		0.2035 (0.0578)	0.1677 (0.0593)
Russian		0.3868 (0.0396)	0.3463 (0.0406)		0.2963 (0.0550)	0.2843 (0.0562)
White German		-0.0144 (0.0430)	-0.0156 (0.0444)		-0.0109 (0.0604)	-0.0116 (0.0621)
Chinese		-0.0867 (0.0444)	-0.1263 (0.0457)		0.0036 (0.0589)	0.0099 (0.0605)
Filipino		-0.6756 (0.0566)	-0.6947 (0.0582)		-0.5592 (0.0665)	-0.5611 (0.0680)

(Continued)

Table 2 (Continued)

Explanatory Variables	Specification					
	Men			Women		
	(1)	(2)	(3)	(4)	(5)	(6)
Korean		0.4654 (0.0428)	0.3687 (0.0441)		0.4622 (0.0546)	0.4069 (0.0561)
Cuban		-0.0150 (0.0442)	-0.0443 (0.0455)		-0.2104 (0.0636)	-0.1771 (0.0654)
Mexican		-0.3495 (0.0486)	-0.3527 (0.0502)		-0.2714 (0.0681)	-0.2601 (0.0701)
Puerto Rican		-0.6166 (0.0548)	-0.6126 (0.0567)		-0.4031 (0.0722)	-0.3596 (0.0741)
African-American		-0.5544 (0.0577)	-0.5508 (0.0599)		-0.4881 (0.0701)	-0.4902 (0.0733)
Black Caribbean		-0.4372 (0.0513)	-0.4631 (0.0526)		-0.4019 (0.0676)	-0.4068 (0.0694)
Native American		-0.2554 (0.0472)	-0.2504 (0.0487)		-0.2503 (0.0627)	-0.2259 (0.0647)
Region Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Sample S.E. Rate	0.127	0.127	0.127	0.067	0.067	0.067
Sample Size	140835	140835	140835	105189	105189	105189
Log Likelihood	-50906	-49437	-46791	-24864	-24327	-23183

Notes: (1) The sample consists of non-agricultural workers who are at least 16 years old and who work 20 or more weeks per year and 15 or more hours per week. (2) The dependent variable is equal to 1 if a person's chief job activity is self-employment. (3) Standard errors are in parentheses below the coefficient estimates. (4) All equations include a constant. (5) The omitted categories for education, immigration, and marital status are never graduated from high school, native born, and never married, respectively.

Table 3

Probit Equations for Self-Employment, Estimated for Selected Ethnic/Racial Groups

1990 Census - Men

Explanatory Variables

| Ethnicity/ Race | High School Graduate | Some College | College Graduate | Year of Immigration to U.S. | | | Age | Age Squared / 100 | N | Log Likelihood |
				1970-90	1950-69	To 1950				
Dutch	0.0418 (0.0982)	0.0685 (0.0990)	0.0247 (0.1024)	0.2661 (0.2103)	-0.0644 (0.1316)	0.4879 (0.3141)	0.0473 (0.0156)	-0.0311 (0.0168)	2853	-1059.67
Greek	-0.0427 (0.0831)	-0.0241 (0.0833)	0.0003 (0.0793)	0.3567 (0.0762)	0.3530 (0.0709)	0.2026 (0.1634)	0.0749 (0.0143)	-0.0638 (0.0153)	3051	-1540.26
Irish	-0.0329 (0.1086)	0.0496 (0.1106)	0.2151 (0.1089)	0.6985 (0.3407)	0.1906 (0.2907)	-0.1526 (0.6187)	0.0477 (0.0171)	-0.0312 (0.0182)	2693	-870.06
Italian	0.0335 (0.0929)	0.0435 (0.0971)	0.1337 (0.0972)	0.3518 (0.1767)	0.1801 (0.1276)	-0.2619 (0.2937)	0.0134 (0.0149)	-0.0057 (0.0159)	2745	-1143.5
Middle East	-0.0962 (0.0956)	-0.0951 (0.0898)	-0.1621 (0.0829)	0.1208 (0.0608)	0.1843 (0.0853)	0.6007 (0.2202)	0.0683 (0.0136)	-0.0499 (0.0148)	3357	-1723.84
Polish	-0.1243 (0.1167)	0.0083 (0.1164)	0.3055 (0.1126)	-0.0395 (0.1573)	0.2028 (0.1636)	0.4286 (0.2424)	0.0139 (0.0169)	-0.0060 (0.0178)	2713	-880.1
Russian	0.0021 (0.1456)	0.0053 (0.1383)	0.1936 (0.1307)	-0.1298 (0.1189)	-0.0258 (0.2465)	0.0492 (0.2092)	0.0690 (0.0135)	-0.0543 (0.0132)	2859	-1584.11
Scandinavian	-0.0172 (0.1167)	0.0116 (0.1156)	0.0727 (0.1152)	-0.0858 (0.3308)	0.1752 (0.2516)	-0.4973 (0.4032)	0.0693 (0.0159)	-0.0504 (0.0166)	2811	-1090.8
Scottish	-0.0127 (0.1341)	0.0854 (0.1298)	0.1730 (0.1278)	0.5364 (0.1841)	-0.0865 (0.1704)	-0.1274 (0.3384)	0.0345 (0.0153)	-0.0189 (0.0160)	3211	-1159.13
White British	-0.0227 (0.1078)	0.0079 (0.1069)	0.1044 (0.1022)	-0.1679 (0.2435)	-0.0573 (0.2288)	0.8112 (0.4447)	0.0692 (0.0156)	-0.0496 (0.0159)	2897	-1095.07
White French	-0.0908 (0.0915)	-0.1571 (0.0988)	-0.0374 (0.1032)	0.2283 (0.2083)	0.1012 (0.2113)	-0.0141 (0.3394)	0.0454 (0.0164)	-0.0260 (0.0178)	2800	-918.04
White German	-0.0261 (0.1002)	-0.0197 (0.1055)	0.0761 (0.1069)	0.0545 (0.4041)	-0.0228 (0.2257)		0.0287 (0.0146)	-0.0098 (0.0158)	2927	-1021.59

(Continued)

Table 3 (Continued)

Explanatory Variables

Ethnicity/ Race	High School Graduate	Some College	College Graduate	Year of Immigration 1970-90	Immigration to U.S. 1950-69	Immigration to U.S. To 1950	Age	Age Squared / 100	N	Log Likelihood
Asian Indian	0.2932 (0.1489)	0.2691 (0.1378)	0.2235 (0.1203)	-0.1913 (0.1922)	-0.1410 (0.2078)	0.5607 (0.5712)	0.0961 (0.0234)	-0.0908 (0.0266)	3140	-1123.27
Chinese	0.1622 (0.1086)	0.0046 (0.1019)	-0.0443 (0.0870)	0.2355 (0.0931)	0.2773 (0.1137)	0.4844 (0.2088)	0.0528 (0.0190)	-0.0425 (0.0205)	2764	-1047.51
Filipino	0.2839 (0.2323)	0.1414 (0.2237)	0.4672 (0.2176)	-0.2077 (0.1396)	-0.1546 (0.1643)	-0.0576 (0.3987)	0.0599 (0.0273)	-0.0481 (0.0298)	2235	-405.25
Japanese	-0.3353 (0.1423)	-0.2708 (0.1428)	-0.2679 (0.1380)	0.1400 (0.0983)	0.1447 (0.1279)	0.1235 (0.3767)	0.0358 (0.0185)	-0.0115 (0.0194)	2555	-839.86
Korean	-0.1358 (0.1128)	0.2058 (0.1088)	-0.0111 (0.1025)	0.4702 (0.1684)	0.2611 (0.1893)		0.1249 (0.0200)	-0.1137 (0.0226)	2531	-1377.36
Vietnamese	-0.0908 (0.1040)	-0.0855 (0.0882)	-0.1055 (0.0968)	0.4470 (0.4144)	-0.0215 (0.6104)		0.0900 (0.0225)	-0.0919 (0.0270)	2978	-846.54
Cuban	0.0165 (0.0830)	-0.0799 (0.0822)	0.0272 (0.0871)	0.0909 (0.1223)	0.2085 (0.1202)	0.2547 (0.3276)	0.0936 (0.0163)	-0.0967 (0.0178)	2837	-1165.91
Mexican	0.0016 (0.1029)	0.1172 (0.1048)	0.4506 (0.1381)	0.1072 (0.0926)	0.0646 (0.1231)	0.6793 (0.2590)	0.0114 (0.0183)	0.0069 (0.0213)	2896	-684.02
Puerto Rican	-0.0671 (0.1163)	-0.0362 (0.1248)	-0.1144 (0.1637)	-0.2136 (0.1281)	-0.0314 (0.1218)	-0.0580 (0.2103)	0.0478 (0.0260)	-0.0443 (0.0303)	2907	-440.9
Spanish	0.0130 (0.1019)	-0.0386 (0.1045)	0.3625 (0.1095)	0.1321 (0.0966)	0.2677 (0.1103)	-0.1517 (0.2971)	0.0525 (0.0191)	-0.0356 (0.0213)	2758	-678.56
Spanish Cntr. American	-0.0901 (0.1155)	0.1564 (0.0996)	0.2419 (0.1300)	0.1309 (0.2215)	0.3017 (0.2433)	0.3232 (0.5169)	0.0411 (0.0227)	-0.0310 (0.0274)	2887	-602.89
Spanish South American	0.0087 (0.0909)	0.0125 (0.0917)	0.1656 (0.0932)	0.2587 (0.1671)	0.1994 (0.1784)	0.7804 (0.5265)	0.0585 (0.0185)	-0.0515 (0.0214)	2816	-972.33

(Continued)

Table 3 (Continued)

Explanatory Variables

Ethnicity/ Race	High School Graduate	Some College	College Graduate	Year of Immigration to U.S. 1970-90	1950-69	To 1950	Age	Age Squared / 100	N	Log Likelihood
African- American	-0.0128 (0.1335)	-0.0385 (0.1428)	0.1816 (0.1568)				0.0522 (0.0255)	-0.0424 (0.0279)	2177	-364.35
Black African	-0.1239 (0.1369)	-0.0085 (0.1217)	-0.1652 (0.1211)	0.2161 (0.0831)	0.2269 (0.1679)		0.0939 (0.0253)	-0.0996 (0.0303)	3029	-747.07
Black Caribbean	0.0283 (0.1068)	0.0252 (0.1080)	-0.0048 (0.1257)	0.0582 (0.1434)	0.2829 (0.1592)	0.2535 (0.4027)	0.1266 (0.0266)	-0.1399 (0.0307)	2485	-581.54
Native American	-0.0623 (0.0936)	-0.1395 (0.1009)	0.0674 (0.1251)				0.0801 (0.0207)	-0.0729 (0.0239)	2759	-703.87
White Native American	-0.0404 (0.0791)	-0.0973 (0.0919)	-0.0533 (0.1309)				0.0670 (0.0175)	-0.0535 (0.0203)	2872	-900.37
French Canadian	-0.0874 (0.0965)	-0.0049 (0.0978)	-0.0671 (0.1067)	0.4383 (0.1880)	0.1425 (0.1451)	0.6265 (0.2406)	0.0629 (0.0170)	-0.0553 (0.0187)	2915	-928.3
Total Sample	-0.0117 (0.0145)	0.0184 (0.0144)	0.0662 (0.0142)	0.1061 (0.0153)	0.1170 (0.0168)	0.1177 (0.0364)	0.0478 (0.0023)	-0.0340 (0.0024)	140835	-49684.75

Notes: (1) The sample consists of non-agricultural workers who are at least 16 years old and who work 20 or more weeks per year and 15 or more hours per week. (2) The dependent variable is equal to 1 if a person's chief job activity is self-employment. (3) Standard errors are in parentheses below the coefficient estimates. (4) The following variables are not reported in the table, but are included in the equations: a constant, marital status, number of children, and region dummies. (5) The omitted education and immigration categories are never graduated from high school and native born, respectively.

Table 4
Log Full-Time Earnings Equations for Self-Employment and Wage/Salary Work
1990 Census - Men

Explanatory Variables	Specification			
	(1)	(2)	(3)	(4)
Selection Correction	No	No	Yes	Yes
Sample (Type of Work)	Self-Employed	Wage/Salary	Self-Employed	Wage/Salary
High School Graduate	0.1965 (0.0429)	0.1428 (0.0071)	0.1965 (0.0449)	0.1418 (0.0078)
Some College	0.3339 (0.0425)	0.2699 (0.0072)	0.3519 (0.0502)	0.2653 (0.0079)
College Graduate	0.8604 (0.0408)	0.6006 (0.0073)	0.9037 (0.0702)	0.5882 (0.0082)
Immigrated 1985 to 1990	-0.3015 (0.0743)	-0.2167 (0.0105)	-0.4098 (0.1590)	-0.1999 (0.0119)
Immigrated 1980 to 1984	-0.2979 (0.0593)	-0.1598 (0.0099)	-0.2269 (0.1102)	-0.1778 (0.0112)
Immigrated 1975 to 1979	-0.1500 (0.0569)	-0.0801 (0.0105)	-0.0235 (0.1730)	-0.1137 (0.0124)
Immigrated 1970 to 1974	0.0201 (0.0597)	-0.0180 (0.0115)	0.1637 (0.1947)	-0.0610 (0.0137)
Immigrated 1965 to 1969	0.0528 (0.0638)	0.0055 (0.0121)	0.1379 (0.1281)	-0.0201 (0.0136)
Immigrated 1960 to 1964	0.0111 (0.0733)	0.0732 (0.0140)	0.0767 (0.1141)	0.0522 (0.0156)
Immigrated 1950 to 1959	0.0636 (0.0666)	0.0683 (0.0136)	0.1176 (0.0986)	0.0505 (0.0151)
Immigrated Before 1950	0.0903 (0.0984)	0.0995 (0.0220)	0.1886 (0.1636)	0.0712 (0.0241)
Problem Speaking English	-0.1342 (0.0598)	-0.1987 (0.0098)	-0.2070 (0.1127)	-0.1834 (0.0111)

(Continued)

Table 4 (Continued)

Specification

Explanatory Variables	(1)	(2)	(3)	(4)
Age	0.0616 (0.0074)	0.0693 (0.0012)	0.1003 (0.0502)	0.0633 (0.0016)
Age Squared/100	-0.0659 (0.0076)	-0.0704 (0.0014)	-0.0920 (0.0345)	-0.0681 (0.0016)
Currently Married	0.3677 (0.0491)	0.2035 (0.0066)	0.4862 (0.1602)	0.1816 (0.0079)
Widowed	0.2956 (0.1417)	0.1181 (0.0283)	0.4144 (0.2131)	0.1005 (0.0309)
Divorced	0.1087 (0.0673)	0.0892 (0.0102)	0.1777 (0.1127)	0.0802 (0.0114)
Currently Separated	0.2560 (0.1117)	0.0756 (0.0162)	0.3205 (0.1425)	0.0680 (0.0180)
Children	0.0399 (0.0119)	0.0025 (0.0020)	0.0789 (0.0515)	-0.0072 (0.0026)
Limiting Disability	-0.4531 (0.0640)	-0.1733 (0.0116)	-0.4373 (0.0702)	-0.1766 (0.0128)
Veteran of Military	-0.0377 (0.0336)	-0.0144 (0.0055)	-0.1792 (0.1850)	0.0201 (0.0076)
Greek	0.1299 (0.1059)	0.0027 (0.0218)	0.4374 (0.4097)	-0.0979 (0.0269)
Russian	0.3267 (0.1046)	0.2168 (0.0222)	0.6423 (0.4195)	0.1068 (0.0278)
White German	-0.0141 (0.1218)	-0.0423 (0.0209)	-0.0209 (0.1274)	-0.0399 (0.0230)
Chinese	-0.3054 (0.1233)	-0.1604 (0.0225)	-0.3439 (0.1383)	-0.1507 (0.0247)
Filipino	-0.0126 (0.1839)	-0.2192 (0.0229)	-0.6209 (0.8027)	-0.0929 (0.0302)

(Continued)

Table 4 (Continued)

Specification

Explanatory Variables	(1)	(2)	(3)	(4)
Korean	-0.0430 (0.1109)	-0.2253 (0.0248)	0.3698 (0.5422)	-0.3850 (0.0335)
Cuban	-0.1238 (0.1227)	-0.1106 (0.0225)	-0.1437 (0.1311)	-0.1060 (0.0247)
Mexican	-0.0820 (0.1517)	-0.1650 (0.0217)	-0.4057 (0.4439)	-0.0941 (0.0257)
Puerto Rican	-0.3799 (0.1879)	-0.1654 (0.0212)	-0.9550 (0.7621)	-0.0637 (0.0270)
African-American	-0.0907 (0.2166)	-0.2239 (0.0226)	-0.6702 (0.7751)	-0.1232 (0.0284)
Black Caribbean	-0.2698 (0.1643)	-0.1823 (0.0227)	-0.7019 (0.5795)	-0.0877 (0.0280)
Native American	-0.6045 (0.1506)	-0.2302 (0.0218)	-0.8457 (0.3463)	-0.1774 (0.0252)
Selection Variable			1.0376 (1.3300)	-0.6873 (0.0876)
Region Dummies	Yes	Yes	Yes	Yes
Mean Log Earnings	10.213	10.154	10.213	10.154
Sample Size	14881	100514	14881	100514
R-Square	0.1031	0.2583	0.1031	0.2588

Notes: (1) The sample consists of non-agricultural workers who are at least 16 years old and who work 40 or more weeks per year and 35 or more hours per week. (2) The dependent variable is log earnings. (3) Standard errors are in parentheses below the coefficient estimates. (4) Specifications 3 and 4 use Heckman's 2-Step Estimator to correct for sample selection. (5) Observations with self-employment earnings less than 1 are recoded as 1. Therefore, the minimum value for log self-employment earnings is zero. (6) All equations include a constant. (7) The omitted categories for education, immigration, and marital status are never graduated from high school, native born, and never married, respectively.

Table 5A

Second-Stage Regressions Explaining Ethnic/Racial Self-Employment Coefficients from Probit Equation
All Ethnic/Racial Groups, 1990 Census - Men

	Specification			
	(1)	(2)	(3)	(4)
First-Stage Earnings Equations: Correction for Sample Selection	No	No	Yes	Yes
Second Stage: Estimation Technique	OLS	WLS	OLS	WLS
1. Ethnic/Racial Coefficient from Self-Employment Earnings Equation	0.828 (0.187)	0.785 (0.173)	0.717 (0.044)	0.701 (0.044)
R-Squared	0.255	0.229	0.826	0.790
2. Ethnic/Racial Coefficient from Wage/Salary Earnings Equation	1.863 (0.305)	1.719 (0.293)	0.160 (0.485)	0.092 (0.447)
R-Squared	0.396	0.337	0.002	0.001
3. Ethnic/Racial Coefficient from Unearned Income Equation	0.326 (0.057)	0.305 (0.057)	0.326 (0.057)	0.305 (0.057)
R-Squared	0.363	0.318	0.363	0.318
4. Difference between Ethnic/Racial Coefficients from SE and WS Earnings Equations	0.568 (0.314)	0.602 (0.288)	0.780 (0.036)	0.769 (0.037)
R-Squared	0.055	0.061	0.890	0.865
5. Ethnic/Racial Coefficients from Self-Employment Earnings Equation	0.079 (0.260)	0.167 (0.250)	0.723 (0.046)	0.702 (0.044)
Wage/Salary Earnings Equation	1.091 (0.572)	0.981 (0.570)	-1.157 (0.179)	-1.164 (0.176)
Unearned Income Equation	0.164 (0.081)	0.134 (0.080)	0.073 (0.034)	0.083 (0.033)
R-Squared	0.438	0.383	0.901	0.876

Notes: (1) The first-stage sample consists of non-agricultural workers who are at least 16 years old and who work 40 or more weeks per year and 35 or more hours per week. (2) The variables included in the Probit equation are the same as those listed in Table 2. (3) The second-stage regressions include a constant and the specified variable (N = 59). (4) The standard errors of the ethnic/racial coefficents from the first-stage Probit equation are used to calculate weights for weighted least squares (WLS). (5) Standard errors are in parentheses below the coefficient estimates. (6) Unearned income includes interest, dividend and net rental income.

Table 5B
Second-Stage Regressions Explaining Ethnic/Racial Self-Employment Coefficients from Probit Equation
Most Precisely Estimated Ethnic/Racial Groups, 1990 Census - Men

	Specification			
	(1)	(2)	(3)	(4)
First-Stage Earnings Equations: Correction for Sample Selection	No	No	Yes	Yes
Second Stage: Estimation Technique	OLS	WLS	OLS	WLS
1. Ethnic/Racial Coefficient from Self-Employment Earnings Equation	0.619 (0.159)	0.616 (0.160)	0.610 (0.053)	0.611 (0.053)
R-Squared	0.253	0.251	0.749	0.752
2. Ethnic/Racial Coefficient from Wage/Salary Earnings Equation	1.292 (0.284)	1.326 (0.271)	0.035 (0.394)	-0.085 (0.389)
R-Squared	0.315	0.332	0.000	0.001
3. Ethnic/Racial Coefficient from Unearned Income Equation	0.199 (0.058)	0.199 (0.058)	0.199 (0.058)	0.199 (0.058)
R-Squared	0.207	0.206	0.207	0.206
4. Difference between Ethnic/Racial Coefficients from SE and WS Earnings Equations	0.557 (0.262)	0.555 (0.263)	0.694 (0.044)	0.694 (0.044)
R-Squared	0.092	0.091	0.849	0.850
5. Ethnic/Racial Coefficients from Self-Employment Earnings Equation	0.229 (0.250)	0.201 (0.249)	0.644 (0.045)	0.642 (0.045)
Wage/Salary Earnings Equation	0.742 (0.588)	0.820 (0.581)	-1.169 (0.174)	-1.165 (0.167)
Unearned Income Equation	0.056 (0.080)	0.052 (0.079)	0.090 (0.032)	0.091 (0.032)
R-Squared	0.333	0.341	0.878	0.877

Notes: (1) The first-stage sample consists of non-agricultural workers who are at least 16 years old and who work 40 or more weeks per year and 35 or more hours per week. (2) The variables included in the Probit equation are the same as those listed in Table 2. (3) The second-stage sample consists of the ethnic/racial groups with the lowest standard errors for the difference between ethnic/racial coefficients from the SE and WS earnings equations. We find a clear break point in both distributions of standard errors, and thus only include the 47 ethnic/racial coefficients with standard errors below both break points. (4) The second-stage regressions include a constant and the specified variable(s). (5) The standard errors of the ethnic/racial coefficients from the first-stage Probit equation are used to calculate weights for weighted least squares (WLS). (6) Standard errors are in parentheses below the coefficient estimates. (7) Unearned income includes interest, dividend and net rental income.

Table 5C
Second-Stage Regressions Explaining Ethnic/Racial Self-Employment Coefficients from Probit Equation
All Ethnic/Racial Groups, 1980 Census - Men

	Specification			
	(1)	(2)	(3)	(4)
First-Stage Earnings Equations: Correction for Sample Selection	No	No	Yes	Yes
Second Stage: Estimation Technique	OLS	WLS	OLS	WLS
1. Ethnic/Racial Coefficient from Self-Employment Earnings Equation	0.649 (0.173)	0.796 (0.182)	0.249 (0.006)	0.253 (0.005)
R-squared	0.210	0.315	0.973	1.009
2. Ethnic/Racial Coefficient from Wage/Salary Earnings Equation	1.690 (0.228)	1.684 (0.230)	-0.382 (0.414)	-0.563 (0.391)
R-squared	0.508	0.504	0.016	0.034
3. Ethnic/Racial Coefficient from Unearned Income Equation	0.314 (0.042)	0.311 (0.042)	0.314 (0.042)	0.311 (0.042)
R-squared	0.510	0.501	0.510	0.501
4. Difference between Ethnic/Racial Coefficients from SE and WS Earnings Equations	0.061 (0.227)	0.194 (0.254)	0.247 (0.005)	0.247 (0.002)
R-squared	0.001	0.014	0.977	0.978
5. Ethnic/Racial Coefficients from Self-Employment Earnings Equation	0.120 (0.158)	0.146 (0.165)	0.239 (0.010)	0.240 (0.006)
Wage/Salary Earnings Equation	0.839 (0.446)	0.805 (0.450)	-0.261 (0.085)	-0.305 (0.052)
Unearned Income Equation	0.161 (0.082)	0.159 (0.081)	0.019 (0.018)	0.011 (0.010)
R-squared	0.552	0.542	0.978	0.965

Notes: (1) The first-stage sample consists of non-agricultural workers who are at least 16 years old and who work 40 or more weeks per year and 35 or more hours per week. (2) The variables included in the Probit equation are the same as those listed in Table 2. (3) The second-stage regressions include a constant and the specified variable (N = 55). (4) The standard errors of the ethnic/racial coefficents from the first-stage Probit equation are used to calculate weights for weighted least squares (WLS). (5) Standard errors are in parentheses below the coefficient estimates. (6) Unearned income includes interest, dividend and net rental income.

Table 6

Industry Distribution of the Self-Employed, Selected Ethnic/Racial Groups

1990 Census - Men

Industry

Ethnicity/Race	Hort. Services 7	General Build. 15	Local Transit 41	Food Stores 54	Eating/ Drinking Places 58	Misc. Retail 59	Personal Services 72	Auto Repair Services 75	Health Services 80	Legal, Engin. & Acct. 81, 87	All Other	SE Count
Dutch	2.7	26.3	1.1	2.2	1.0	3.2	2.1	4.2	5.3	6.5	45.4	373
Greek	0.6	14.0	1.3	2.9	24.6	6.0	3.2	1.3	6.3	8.8	31.0	715
Irish	2.8	18.9	0.0	1.5	1.2	4.2	3.8	3.9	7.4	8.5	47.8	293
Italian	3.6	18.7	0.9	2.6	5.8	5.2	8.2	3.4	5.5	5.6	40.5	418
Middle Eastern	0.4	6.3	1.6	9.7	7.9	9.8	3.5	2.3	9.8	5.6	43.3	797
Polish	2.7	16.5	1.9	2.0	3.1	3.3	2.1	2.6	14.8	12.9	38.2	290
Russian	0.5	5.5	0.9	1.0	0.8	4.4	1.4	0.7	17.0	22.4	45.5	753
Scandinavian	1.6	20.8	0.0	1.8	3.1	4.0	2.3	3.6	7.0	9.2	46.7	401
Scottish	1.6	18.2	0.3	0.9	1.4	3.1	1.5	3.2	7.7	12.6	49.6	399
White British	3.0	17.2	0.0	1.2	1.1	7.1	2.8	3.7	7.1	11.2	45.6	399
White French	1.7	23.8	0.0	2.1	1.2	8.7	3.4	2.8	4.4	5.4	46.6	308
White German	2.6	20.8	0.5	1.5	1.1	6.6	2.8	3.0	4.8	5.0	51.3	345
Asian Indian	0.6	3.8	4.5	8.9	3.5	7.9	3.0	1.4	31.2	6.8	28.5	394
Chinese	0.9	4.3	1.3	2.8	25.7	8.5	4.7	1.8	11.2	5.3	33.6	387
Filipino	2.7	5.3	1.5	0.0	5.9	4.4	1.0	4.2	29.4	6.8	38.9	111
Japanese	16.5	5.2	0.4	3.6	6.0	3.7	2.5	2.8	14.6	5.8	39.0	306
Korean	0.8	6.5	1.3	11.9	8.1	11.1	13.2	1.8	7.1	2.7	35.5	741
Vietnamese	6.2	5.6	1.0	4.5	15.0	6.9	9.2	4.2	2.7	2.5	42.1	258
Cuban	3.9	21.3	1.3	4.3	3.0	6.4	2.8	3.1	6.9	5.4	41.7	446
Mexican	11.7	27.3	0.5	2.5	5.8	3.4	1.4	10.7	2.7	2.6	31.3	197
Puerto Rican	2.1	19.3	3.0	7.8	4.2	13.5	4.4	0.8	2.3	6.0	36.7	107
Spanish	4.4	15.9	0.9	3.3	6.9	6.3	2.3	4.7	8.7	6.4	40.2	209
Spanish C.A.	9.1	21.1	1.7	3.5	7.9	3.8	2.7	6.0	5.3	1.3	37.8	165
Spanish S.A.	3.3	18.5	4.8	1.4	3.1	3.7	4.2	5.7	8.1	4.2	43.2	329
African-American	4.6	22.1	1.8	1.7	4.3	2.2	2.9	6.5	3.0	5.6	45.3	92
Black African	0.9	8.6	29.0	2.0	1.5	3.2	1.8	3.0	5.2	9.9	35.1	213
Black Caribbean	3.2	23.9	23.8	2.3	1.1	2.7	1.8	4.2	4.3	4.5	28.3	167
Native American	3.8	32.4	1.2	1.2	1.3	2.7	4.3	5.5	0.9	6.3	40.4	209
White Native Am.	2.3	32.7	0.5	4.2	1.2	3.1	3.0	12.8	1.1	1.2	38.1	295
French Canadian	3.0	28.0	0.0	2.1	3.8	5.1	4.1	2.6	4.4	6.0	41.0	301
United States	3.2	20.3	0.6	2.1	2.9	5.2	2.7	3.5	6.1	9.2	44.2	6613

(Continued)

Table 6 (Continued)

Notes: (1) The sample consists of non-agricultural self-employed workers who are at least 16 years old and
who work 20 or more weeks per year and 15 or more hours per week. (2) Industry distributions are calculated
using weights provided by the Census. (3) Industries are reported as 2-digit SIC's. Complete descriptions
of each SIC are:

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7 - Horticultural Services
15 - General Building Construction
41 - Local and Interurban Transit: bus service, urban transit, and taxicab service
54 - Food Stores: grocery stores, retail bakeries, and dairy product stores
58 - Eating and Drinking Places
59 - Miscellaneous Retail: drug, liquor, sporting goods, book, jewelry and
     sewing goods stores, mail order houses, vending machine operators, direct selling
     establishments, fuel and ice dealers, and retail florists
72 - Personal Services: laundry services, cleaning services, beauty shops, barber
     shops, funeral service, crematories, shoe repair shops, and dressmaking shops
75 - Automotive Repair, Services and Parking
80 - Health Services: offices of physicians, dentists, chiropractors, optometrists
     and health practitioners, hospitals, and nursing facilities
81 - Legal Services
87 - Engineering, Architectural, Accounting, Research, and Related Services

Table 7
Ethnic/Racial Group Self-Employment Rate Regressions including Self-Employment Rate in Home Country - 1990 Census Men

|	Specification	
	(1)	(2)
Estimation Technique	OLS	WLS
1. Dependent Variable: Ethnic/Racial Group Self-Employment Rate in U.S.		
A. Self-Employment Rate in Home Country	0.060	0.052
All 32 Countries	(0.096)	(0.095)
R-Squared	0.013	0.002
B. Self-Employment Rate in Home Country	0.173	0.137
Excludes Communist Countries (N=25)	(0.167)	(0.155)
R-Squared	0.045	0.008
2. Dependent Variable: Ethnic/Racial Group Coefficient from First-Stage Probit Equation		
A. Self-Employment Rate in Home Country	-0.094	0.009
All 32 Countries	(0.445)	(0.430)
R-Squared	0.002	0.000
B. Self-Employment Rate in Home Country	0.112	0.251
Excludes Communist Countries (N=25)	(0.795)	(0.774)
R-Squared	0.001	0.004

Notes: (1) The self-employment rate is the percentage of all those working who are self-employed. (2) The first-stage sample consists of non-agricultural workers who are least 16 years old and who work 20 or more weeks per year and 15 or more hours per week. (3) The variables included in the Probit equation are the same as those listed in Table 2. (4) Home country self-employment rates are obtained from the International Labour Office and are generally for 1970. (5) The standard errors of the ethnic/racial self-employment rates and coefficients from the first-stage Probit equation are used to calculate weights for weighted least squares (WLS). (6) Standard Errors are in parentheses below the coefficient estimates. (7) All equations include a constant. (8) The average self-employment rates for the included groups are 13.2 percent in the U.S. and 16.0 percent in their home countries.

Figure 1
Relationship between Ethnic/Racial Coefficients from the Probit Equation and the Difference
between the Coefficients from the Log Self-Employment and Wage/Salary Earnings
Equations - 1990 Census

Log Earnings Equations estimated with OLS
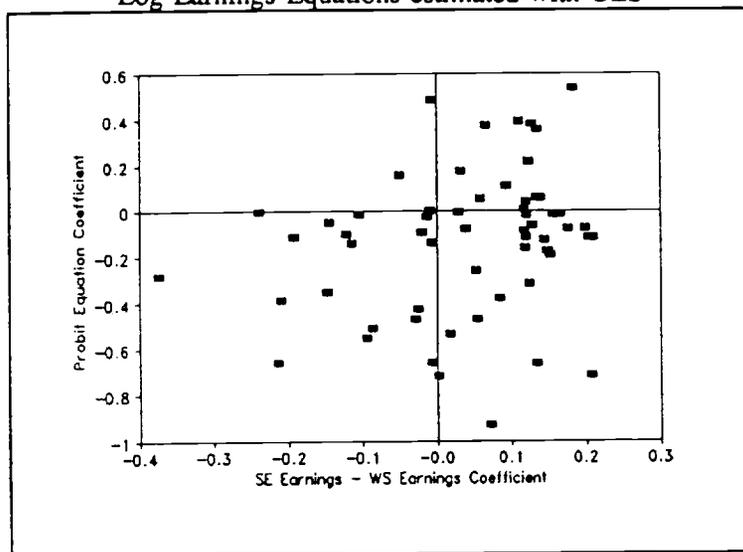
Log Earnings Equations estimated with Selection Correction
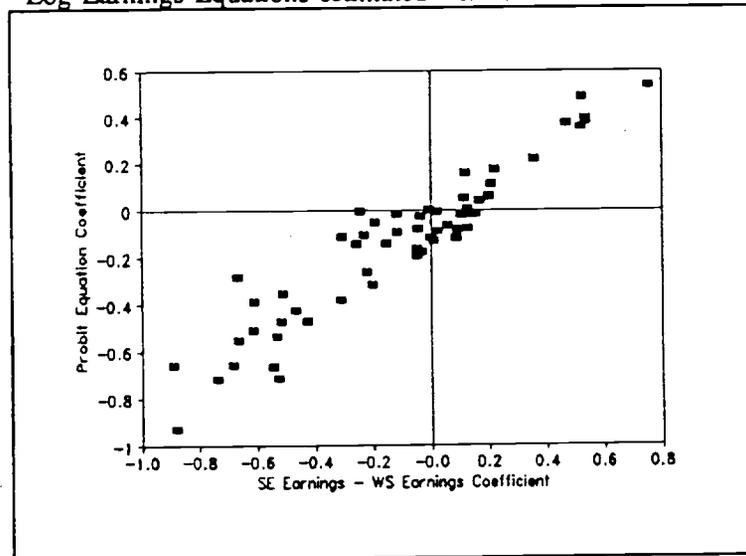
Note: (1) The Probit equation and the log earnings equations are estimated with a sample of male non-agricultural workers who are at least 16 years old and who work 40 or more weeks per year and 35 or more hours per week.

Appendix A
Definitions of Ethnic Groups

Alsatian: Alsatian
Belgian: Belgian
British (Black and White): British, Cornish, English, Manx, Welsh
Cypriot: Cypriot, Greek Cypriote, Turkish Cypriote
Dutch: Dutch, Frisian
Finnish: Finnish, Finno Ugrian
French (Black and White): French, French Basque, Corsican, Breton, Occitan, Acadian
German (Black and White): German, Austrian, Tirol, Bavarian, Prussian, Saxon,
    Liechtensteiner, Luxemburger, German from Russia, Windish, Pennsylvania German
Greek: Greek
Irish: Irish, Northern Irelander, Celtic
Italian: Italian, Friulian, Sicilian
Portugal: Portuguese, Azorean
Scottish: Scottish
Swiss: Swiss
Scandinavian: Scandinavian, Danish, Faeroe Islander, Icelander, Lapp, Norwegian,
    Swedish, Greenlander
South European: Andorran, Basque, Maltese, Monegasque
Albanian: Albanian
Bulgarian: Bulgarian, Macedonian, Bucovina
Czechoslovakian: Czechoslovakian, Czech, Silesian
Estonian: Estonian
Gypsy: Rom
Hungarian: Hungarian
Latvian: Latvian
Lithuanian: Lithuanian
Polish: Polish
Rumanian: Romanian
Russian: Russian, Azerbaijani, Cossack, Soviet Turkic, Tatar, Turkestani
Slovak: Slovak
Soviet: Soviet Union N.E.C., Belourussian, Carpatho Rusyn, Rusyn, Ruthenian, Gruziia,
    Kalmyk, North Caucasian
Ukrainian: Ukrainian
Yugoslavian: Yugoslavian, Croatian, Montenegrin, Serbian, Slovene, Slavic
Spaniard: Spaniard, Spanish Basque, Galician, Catalonian
Mexican: Mexican
Central American (Black, Spanish and White): Central American, Costa Rican, Guatemalan,
    Honduran, Nicaraguan, Panamanian, Salvadoran, Canal Zone, Equadorian, Latin
    American
South American (Black, Spanish and White): South American, Argentinean, Bolivian,
    Chilean, Colombian, Paraguayan, Peruvian, Uruguayan, Venezuelan, Criollo,
    Brazilian, San Andres, Guyanese, Surinam
Puerto Rican: Puerto Rican

Cuban: Cuban

Carribean (Black and Spanish): Domincan, Bahamian, Barbadian, Belizean, Bermudan, Cayman Islander, Jamaican, Dutch West Indies, Trinidadian Tobagonian, US Virgin Islander, British Virgin Islander, British West Indies, French West Indies, West Indian, Haitian

Spanish: Spanish, Hispanic

Africa (Black and White): Algerian, Egyptian, Libyan, Moroccan, Tunisian, North African, Alhucemas, Berber, Rio de Oro, Angolan, Benin, Botswana, Burundian, Cameroonian, Cape Verdean, Central African Republic, Chadian, Congolese, Djibouti, Equatorial Guinea, Ethiopian, Gabonese, Gambian, Ghanian, Guinean, Guinea Bissau, Ivory Coast, Kenyan, Lesotho, Liberian, Madagascan, Malawian, Malian, Mauritanian, Mozambican, Namibian, Niger, Nigerian, Rwandan, Senegalese, Sierra Leonean, Somalian, Swaziland, South African, Zulu, Sudanese, Tanzanian, Togo, Ugandan, Upper Voltan, Zairian, Zambian, Zimbabwean, African Islands, Central African

Middle Eastern: Mideast, Bahraini, Iranian, Iraqi, Jordanian, Kuwaiti, Lebanese, Saudi Arabian, Syrian, Yemeni, Omani, Kurdish, Palestinian, South Yemen, United Arab Emirates, Assyrian, Arab

Israeli: Israeli

Armenian: Armenian

Turkish: Turkish

South West Asian: Afghanistan, Bhutanese, Nepali, Pakistan, Sri Lankan, Maldivian

Asian Indian: Asian Indian, Bangladeshi

Other South Asian: Burmese, Cambodian, Indonesian, Malaysian, North Borneo, Singaporean, Formosan

Chinese: Chinese, Mongolian, Tibetan, Hong Kong, Macao, Taiwanese

Filipino: Filipino

Japanese: Japanese, Ryukyu Islander, Okinawan

Korean: Korean

Laotian: Laotian, Hmong

Vietnamese: Vietnamese, Montagnard

Oceania: Australian, New Zealander, Fijian, New Guinean

Pacific Islander: Pacific Islander, Polynesian, Samoan, Tongan, Tokelauan, Cook Islander, Tahitian, Niuean, Micronesian, Guamanian, Saipanese, Palauan, Marshallese, Kosraean, Ponapean, Chuukese, Yapese, Carolinian, Kiribatese, Nauruan, Tarawa Islander, Tinian Islander, Melanesian Islander, Solomon Islander, New Caledonian Islander, Vanuatuan

African American: Afro American

Native American (Native American and White): American Indian, Central American Indian, South American Indian, Aleut, Eskimo, Inuit

Canadian: Canadian

French Canadian: French Canadian

Note: A few ethnic/racial groups defined above are not utilized in our analysis because of small sample sizes. See Appendix I in the 1990 Census of Population and Housing Technical Documentation for a complete description of the possible responses for each group.

13.   What is this person's ancestry or ethnic origin?
      (See instruction guide for further information.)

_____

(For example: German, Italian, Afro-Amer., Croatian,
Cape Verdean, Dominican, Ecuadoran, Haitian, Cajun,
French Canadian, Jamaican, Korean, Lebanese, Mexican,
Nigerian, Irish, Polish, Slovak, Taiwanese, Thai,
Ukrainian, etc.)

Instructions to Respondents

13.   Print the ancestry group. Ancestry refers to the person's ethnic origin or
      descent, "roots," or heritage. Ancestry also may refer to the country of birth
      of the person or the person's parents or ancestors before their arrival in the
      United States. *All* persons, regardless of citizenship status, should answer
      this question.

      Persons who have more than one origin and cannot identify with a single
      ancestry group may report two ancestry groups (for example, German-Irish).

      Be specific. For example, print whether West Indian, Asian Indian, or
      American Indian. West Indian includes persons whose ancestors come from
      Jamaica, Trinidad, Haiti, etc. Distinguish Cape Verdean from Portuguese;
      French Canadian from Canadian; and Dominican Republic from
      Dominica Island.

      A religious group should not be reported as a person's ancestry.

Appendix C
Means of Selected Variables by Ethnic/Racial Group
1990 Census

Ethnicity/Race	Sample Size	Self-Employment Rate	Average Ln (SE Earnings)	Average Ln (WS Earnings)	Ln (Unearned Income)	Percent College Graduates	Percent Immigrants
African-American	4709	3.2%	9.17	9.52	0.51	14.7%	0.8%
Armenian	4822	18.5%	9.99	9.91	2.58	36.3%	46.8%
Asian Indian	4968	10.7%	10.17	9.88	2.46	60.5%	96.0%
Belgian	3481	10.0%	9.72	9.84	2.40	26.0%	14.7%
Black African	4971	5.6%	9.36	9.65	0.68	35.2%	56.7%
Black British	836	4.4%	9.41	9.41	0.42	9.2%	27.3%
Black Caribbean	5049	4.9%	9.39	9.65	0.73	15.8%	88.3%
Black Central Am.	1100	3.2%	9.09	9.68	0.54	13.9%	88.0%
Black South Am.	1380	3.6%	9.55	9.71	0.80	16.3%	96.0%
Canadian	4983	11.2%	9.84	9.86	2.08	25.3%	43.6%
Chinese	5058	11.7%	9.69	9.73	2.93	45.8%	80.6%
Cuban	5044	11.5%	9.65	9.64	1.16	18.3%	84.4%
Czechoslovakian	5049	10.6%	9.55	9.80	2.50	27.4%	6.1%
Dutch	4929	10.2%	9.60	9.74	1.92	21.4%	8.0%
Filipino	4891	4.0%	10.01	9.80	1.32	40.8%	85.0%
Finnish	4975	9.5%	9.62	9.77	1.96	25.1%	6.5%
French Canadian	4988	8.4%	9.74	9.79	1.90	17.3%	8.7%
Greek	5013	18.2%	9.97	9.83	2.27	31.6%	32.3%
Hawaiian	3141	5.6%	9.52	9.65	1.03	11.3%	2.6%
Hungarian	4963	11.4%	9.96	9.94	2.55	30.9%	18.2%
Irish	4870	8.7%	9.66	9.78	1.76	24.9%	1.8%
Israeli	1244	22.6%	10.16	9.96	2.35	43.7%	77.3%
Italian	4815	11.3%	9.97	9.86	2.14	22.4%	7.9%
Japanese	4950	9.1%	10.03	9.93	2.78	38.0%	32.1%
Korean	5107	24.0%	9.87	9.38	1.28	34.9%	94.2%
Laotian	2152	2.6%	9.26	9.37	0.57	5.3%	99.3%
Latvian	1232	13.6%	9.96	10.08	3.60	53.7%	46.4%
Lithuanian	4958	12.0%	10.04	9.98	3.04	38.1%	9.0%
Mexican	4740	5.9%	9.36	9.42	0.54	6.2%	46.1%
Middle Eastern	4991	19.4%	10.01	9.84	2.09	44.4%	64.6%
Native American	5192	6.0%	9.04	9.42	0.93	10.0%	3.3%
Oceania	789	8.6%	9.94	9.87	1.69	30.4%	64.8%
Other South Asian	2023	5.4%	9.46	9.48	0.99	20.3%	97.0%
Pacific Islander	2364	4.7%	9.12	9.55	0.53	8.6%	74.5%
Polish	4854	8.2%	9.84	9.86	2.35	24.6%	10.1%
Portuguese	5031	8.7%	9.58	9.74	1.63	11.4%	42.4%

(Continued)

Appendix C (Continued)

Ethnicity/Race	Sample Size	Self-Employment Rate	Average Ln (SE Earnings)	Average Ln (WS Earnings)	Average Ln (Unearned Income)	Percent College Graduates	Percent Immigrants
Puerto Rican	5163	3.2%	9.28	9.61	0.63	12.4%	55.3%
Rumanian	3737	15.3%	9.97	9.95	2.68	39.3%	41.0%
Russian	5007	20.6%	10.33	10.16	3.74	57.6%	8.7%
Scandinavian	4988	11.1%	9.68	9.78	2.17	28.0%	3.1%
Scottish	4998	11.1%	9.88	9.93	2.28	35.2%	6.8%
Slovak	4905	8.8%	9.83	9.87	2.61	27.7%	3.7%
Southwest Asian	2041	12.5%	10.05	9.70	1.51	49.0%	97.0%
Spaniard	5026	9.7%	9.80	9.73	1.49	20.2%	52.1%
Spanish	5015	6.7%	9.55	9.51	0.73	11.7%	34.3%
Spanish Caribbean	5034	6.5%	9.49	9.43	0.41	9.4%	90.7%
Spanish Central Am.	4979	5.3%	9.34	9.35	0.42	8.4%	94.7%
Spanish South Am.	4997	9.8%	9.74	9.57	0.83	19.5%	92.9%
Swiss	5065	14.6%	9.71	9.88	2.86	35.2%	12.6%
Thai	2054	9.9%	9.71	9.53	1.42	30.4%	96.1%
Turkish	1197	16.3%	10.18	9.89	2.20	44.5%	71.3%
Ukrainian	4930	10.8%	9.98	9.95	2.89	36.3%	20.6%
Vietnamese	4982	8.7%	9.25	9.56	1.15	20.7%	98.6%
White African	2439	14.8%	10.10	9.95	2.10	54.2%	86.6%
White British	4913	11.3%	9.67	9.82	2.29	30.2%	4.4%
White French	5003	9.5%	9.51	9.70	1.50	17.4%	5.2%
White German	5006	9.6%	9.70	9.73	2.01	21.2%	3.3%
White Native Am.	5087	8.2%	9.21	9.52	0.81	7.2%	0.9%
White South Am.	827	10.3%	9.68	9.61	1.04	27.3%	72.6%
Yugoslavian	4969	10.4%	9.89	9.83	2.14	24.8%	18.7%
Total Sample	246024	10.1%	9.79	9.73	1.77	26.4%	40.2%

Notes: (1) The sample consists of non-agricultural workers who are at least 16 years old and who work 20 or more weeks per year and 15 or more hours per week. (2) All numbers reported include both men and women. (3) The self-employment rate is the percentage of all those working who are self-employed. (4) Average Ln SE and WS earnings are calculated for the respective samples. (5) Observations with self-employment earnings less than 1 are recoded as 1. Therefore, the minimum value for log self-employment earnings is zero. (6) Unearned income includes interest, dividend, and net rental income.