

Selectivity Bias and Decomposition of Women's Earnings

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Selectivity-bias-corrected earnings functions are estimated for three major continental groups of immigrant women—Hispanics, Asians, and Europeans—using data from 1-in-100 sample of 1980 U.S. Census. Market earnings do not differ much between Asian and European immigrant women as the effects of personal and market characteristics of these two groups are mainly off-setting. Both these noted two groups of immigrant women have much advantages over Hispanics in both earnings characteristics and returns to these characteristics.

I. Introduction

Previous generations of immigration studies concentrated on estimating differences in earnings between ethnic groups of male immigrants (Borjas, 1985, 1987 ; Chiswick, 1978, 1980, 1982 ; and, Fuji and Mak, 1985). Women generally earn less, on average, than their male counterparts as the market earnings of women are traditionally affected by their household responsibilities. Long (1980) indicated that the earnings of foreign-born females were about 13 percent higher than those of their native-born counterparts.¹ Long (1980) further noted that the foreign-born earnings advantage was relatively larger for females than males compared to their native-born counterparts. We rarely have any knowledge about how female immigrant minorities differ from one another in their U.S. earning. According to a Chow-test, the

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1. Long, E. J., "The Effects of Americanization on Earnings : Some Evidence of Women," *Journal of Political Economy* , Volume 88, no. 31 (1980) p. 621-629.

earnings functions by continental groups of workers in the U.S. are structurally different, probably because of continental differences in quality and quantity of human capital and the other omitted variables.² As in 1-in-100 sample of 1980 Census data, Asian and Hispanic male immigrants of age 20-64 earned 16 and 44 percent, respectively, less than European male immigrants (Rahman, 1988). The same data set on female immigrants of age 20-64 shows that Asian immigrants earned 2 percent more (instead of less), and Hispanic immigrants 26 percent less than European immigrants. The purpose of this study is to analyze the selectivity-bias-corrected earnings of three major groups of female immigrants—Asians, Europeans and Hispanics—and to see how the former two groups of women are capable of earning substantially more than Hispanics. Furthermore, this is a comparison of earnings between relatively more homogeneous groups than those of previous studies between whites and non-whites.

The data base consists of 1-in-100 sample of the 1980 Census of Population for two states where most immigrants are likely to settle, namely, New York and California. In this data source, personal and family characteristics are given for the family, which forms the study unit in this work. I have selected those immigrant women of age 20-64 who worked at least one week in 1979. Both the salary and wage workers, and, farm and non-farm self-employed workers are included in this study of labor earnings. Europeans are defined as *non-Hispanic Europeans* throughout this work. Immigrants' data are mainly from urban areas (95 percent on average). Immigrants in this sample are both old and

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- 2 A pair by pair Chow-test of the Asian, Hispanic and European-Americans' earnings functions suggest that we compare earnings of each immigrant group with those of their U.S. -born counterparts (instead with those of a single native non-Hispanic white as traditionally done in Chiswick and Borjas) All the calculated values of

$$F = [(SSR - SSE_1 - SSE_2)/k] / [(SSE_1 + SSE_2) / (n + m + 2k)]$$

are significant at the 5 percent probability level. F-values of tests of functional equality between Asian and European-Americans are 1.69, Asian and Hispanic-Americans 2.62, and between Hispanic and European-Americans 4.33. Tabulated F-value with $k=12$ and infinite degrees of freedom is 1.75. We do reject the hypothesis that the entire regression relationship is stable (or that slope coefficients are equal). Earnings functions by continental groups workers, as noted above, are structurally different.

new, post-WWII and pre-WWII, though most immigrated to the U.S. between WWII and 1979. The working women immigrant sample sizes are 1,291 Hispanics, 922 Asians and 1,502 Europeans.

II. Selectivity Bias

Self-selectivity of male immigrants from their society of origin does not necessarily imply that their wives are also self-selected immigrants.³ The immigration of housewives is unlikely to be an outcome of their independent migration decision. Housewives may have played the role of followers when their husbands moved to the U.S. Female immigrants are, however, selected in choosing their self-selected immigrant husbands. A bias may also arise in comparison of earnings even when women choose their levels of education on the basis of incremental return to incremental education or in order to get married to the educated husbands. Relating the female immigrant's marital choice variables to their U.S. earnings is beyond the scope of this work. Here, we tackle only their work-selectivity-bias that usually arises in the secondary labor market.

All immigrant women do not participate in the labor force. In our sample, 66 percent of Asian women of age 20-64 participates in the labor force compared to 62 percent of Europeans and 59 percent of Hispanics. Thus, our sample of working immigrants are non-random, a problem of limited dependent variable of a regression. How the women workers participate in the labor force is assumed to be related to the unobservable error term in the regression. This is a violation of OLS rules if the expected value of error term is not zero.

Consider a form of probit regression model.

$$W_1 = X_1 b_1 + e_1 \quad (1)$$

$$W_1 = 1, \text{ iff. } e_1 > -X_1 b_1 \quad (1.1)$$

$$W_1 = 0, \text{ iff. } e_1 < -X_1 b_1 \quad (1.2)$$

$$W_2 = X_2 b_2 + e_2 \quad (2)$$

$$E(W_2) = X_2 b_2 + E(e_2/e_1 > -X_1 b_1) = X_2 b_2 + CL \quad (3)$$

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3. Male immigrants are known to be relatively young, better educated, risk-takers, and more adventurous and enterprising. They tend to have better contacts in certain destination than those who remain in their country of origin.

where, $L = f(X_1b_1)/F(X_1b_1)$, L is an inverse Mill's ratio, ratio of p.d.f. over c.d.f. of labor force participation behavior. In equation (1), W_1 is probability of labor force participation ; X_1 characteristic vector determining labor force participation ; b_1 coefficient vector ; e_1 bivariate normal error term distributed as $\sim N(0, 1)$. If $W_1 > 0$ (some threshold value), women individuals participate in the labor force. In equation (2), W_2 is observed labor market earnings ; X_2 is a characteristic vector determining earnings ; b_2 and e_2 are coefficient vector and random error term, respectively, in the earnings equation. The coefficient vector is common to workers of a continent group. The expected value of e_2 is normally assumed to be zero. As noted before, earnings are observed only for those immigrant women who worked in 1979. Thus, the expected value of error term of non-random sub-sample, $E(e_2/e_1 > -X_1b_1)$, is not zero. The average earnings that we observe would be subject to selectivity bias. Without correcting this bias, the OLS estimate of the earnings equation would be inappropriate.⁴

Heckman (1979) suggested to estimate a probit equation to predict an inverse Mill's ratio for each observation, then entering the inverse Mill's ratio in the earnings model as the additional explanatory variable. This additional regressor controls for the possible bias in estimating the error term of the earnings model. Mill's ratio method by Heckman requires to compute maximum likelihood models with an iterative probit as the first step. As suggested by Olsen (1980), we can still use the regression technique by an alternative derivation of Mill's ratio method. Instead, we start with a linear probability model of labor force participation and derive a similar correction for selectivity bias. Only the difference is the assumption about distribution of e_1 , bivariate normal in Heckman's iterative procedure and uniform in Olsen method. As required by the latter procedure, the effect of selectivity is identified by including public assistance income and the presence and age structure of children in my labor force participation equation, which do not appear in the earnings model.

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4. Working women are a secondary labor-force group. The earnings a person receives depend on his/her personal and job-characteristics as well as on his/her job-search procedure (Gronau, 1974). According to Gronau, this group is characterized by partial participation in the labor force. This indicates that portions of the wage-offer distribution faced by this group is considered too low to be acceptable. See Reuben Gronau, "Wage Comparisons—a Selectivity Bias," *Journal of Political Economy*, Volume 82, no. 6, (1970), pp. 1119-1143.

III. Specification of the Model

A theoretical earnings function for female immigrants is the same as for male immigrants. An earnings function may be written as : $E = E(H, A)$ where, E is labor earnings, a sum of wage or salary income and farm and non-farm self-employment income ; H is human capital ; and A is ability or other inherited endowment. According to the traditional theoretical earnings model (e.g., Mincer, 1958, 1974 ; Becker, 1974 ; and, Becker and Tomes, 1979), A is exogenous, while formal schooling or on-the-job-training and experience can be acquired. In this study of differences in earnings between continental groups of immigrant women, I defined A more broadly. I consider it (A) to be associated with living in a specific country. For instance, Griliches (1974) found that the effect of ability on income works through the acquisition of education. Also, the individual's family background affects individual's earnings both directly and indirectly (Taubman, 1975).

Including some variables special to the women workers, the following general earnings function is estimated in this study : ⁵

$$\ln Y = a + bH + fX + gX^2 + iW_1 + jW_2 + IM \\ + Ch-O-6 + Ch-U-6 + rLang + Dummies + V$$

Quadratic terms are included to specify non-linearity in the earnings function which fits the real world observation (data). For example, experience-earnings profiles are better estimated by concave functions (Mincer, 1974 ; and Heckman, 1976). The earnings function is estimated separately for each group of immigrants. The symbols stand for the following :

Y = Estimated average hourly earnings

H = Human capital, as measured by years of schooling completed

X = Experience (Age-School Years - 6)

X^2 = Experience squared

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5. The logarithm of average hourly earnings over the year is regressed against a set of explanatory variables (personal, family and market characteristics) in the above specification so that the estimated coefficients may be interpreted as percentage changes. This analysis of human capital earnings function is consistent with that of Mincer (1974) and Heckman (1976).

W_1 = Married

W_2 = Married, spouse present, and working

IM = Family wealth, as proxied by property income

Children-O-6 = Presence of children over six in the household

Children-U-6 = Presence of children under six in the household

Language = Index of English proficiency

Other dummy variables in the regression :

Migrants (1960s) = 1, if an immigrant during 1960-69
= 0, otherwise (during 1970s)

Migrants (1950s) = 1, if an immigrant during 1950-59
= 0, otherwise (during 1970s)

Migrants (pre-1950) = 1, if an immigrant before 1950
= 0, otherwise (during 1970s)

Rural dweller = 1, if a rural dweller
= 0, otherwise (urban dweller)

California = 1, if a resident in California
= 0, otherwise (resident of New York state)

Self-employed = 1, if a self-employed worker
= 0, otherwise (wage and salary worker)

Informal-sector = 1, if an employee in the low productivity
sector
= 0, otherwise (formal sector)

V = Error term

Having seen the differences in personal and market characteristics and in marginal returns to these characteristics, in this section we intend to breakdown the differences in earnings due to these noted differences between immigrant groups of women. The observed earnings differences between different immigrant communities are computed by a traditional statistical procedure (equation 1 below). To calculate expected earnings differences between them, we follow Oaxaca (1973) and Reimers

(1983) for a four-step procedure (equation 2 through equation 5 below).

$$1. \sum_i \ln Y_{ij} / n_j - \sum_i \ln Y_{ik} / n_k$$

$$2. \sum b_E X_E - \sum b_E X_T$$

$$3. \sum b_T X_E - \sum b_T X_T$$

$$4. \sum b_E X_E - \sum b_T X_E$$

$$5. \sum b_E X_T - \sum b_T X_T$$

where b_E and b_T are the coefficients of European and the other immigrant earnings functions, respectively ; X_E and X_T are the earnings characteristics of Europeans and the other immigrants, respectively.

We know the earnings functions by continental groups are structurally different, but we do not know the real index of earnings. We take a weighted average of the two earnings behaviors of two groups of workers for a suitable comparison of their earnings due to differences in skill characteristics (Reimers, 1983). Characteristics Measure : Equation 1 measures the observed earnings difference between group J and group K. Equation 2 measures the earnings difference between the two groups due to differences in skill characteristics if the other immigrants (say, T) are provided with the Europeans' return (b_E). Equation 3 estimates the earnings difference between European and the other immigrant groups due to differences in characteristics if the European groups are given the other immigrant groups' rates of return (b_T). The weighted average of equations 2 and 3 yields the overall earnings differences between European and the other immigrant groups due to differences in characteristics, .5(2+3).

Parametric Measure : Equation 4 calculates the earnings difference between Europeans and the other immigrant groups due to differences in returns if the other immigrant groups are provided with the European groups' earnings characteristics (X_E). If the European groups are given the other immigrant groups' characteristics (X_T), equation 5 estimates the earnings difference between European and the other immigrant groups due to differences in returns. The overall earnings difference between European and the other immigrant groups due to differences in

returns is measured by taking a weighted average of equations 4 and 5, $\cdot 5(4+5)$.

IV. Empirical Results

Table 1 presents the mean variables of linear probability model of labour force participation by continental groups of immigrant women of age 20-64. In this table, we expect to see how the personal and market characteristics are associated with the labor force participation of the three major groups of immigrant women, i.e., Asians, Europeans and Hispanics. Note that data in this table present the entire sample of female immigrants regardless of their working status.⁶ Hispanics have the lowest level of labor force participation. Personal, family and market characteristics probably are not favorable to Hispanics as much as to Asian and European immigrants, in order to be in the U.S. labor force. For example, Asian and European women in the U.S. are of relatively upper middle age and have higher levels of schooling than Hispanics. Husbands' education, a proxy for husbands' income, family's net assets, and number of young children have positive effects on the wife's asking wage (Gronan, 1974 ; Heckman, 1979). Husbands' education is, however, the highest for Asians. Europeans and Hispanics are the next. Furthermore, Hispanic women have the lowest level of English proficiency compared to the two other groups of immigrant women. More importantly, Hispanic women are more likely to have young children. For example, 44 percent of female immigrant workers of Hispanic origin have children under six compared to 32 percent of Asians and 16 percent of Europeans . Hispanics received relatively more public assistance income than Asians and Europeans, which presumably raises housewives' reservation wage.

Table 2 presents the linear probability estimate of labor force participation of these noted three groups of female immigrants to the U.S. In this table, we expect to define the relative influence of different characteristics pertinent to the immigrant women's labor force participation. Assuming that education affects market productivity as well as the distribution of market earnings, women

6 Previously noted, 66 percent Asian women participated in the labor force compared to 62 percent of Europeans and 59 percent of Hispanics.

Table 1 : Mean Variables of Linear Probability Models of Labor Force Participation by Continental Groups of Immigrant Women of Age 20-24 : 1980 Census

Variables	Hispanics	Asians	Europeans
Labor force	.59	.66	.62
Education (year)	7.93	12.57	11.61
Age (year)	36.55	37.73	44.59
Age square (year)	1464.50	1525.50	2121.30
Husbands' educ(yrs)	8.73	14.03	12.62
English proficiency	.23	.44	.76
Health disability	.06	.04	.08
Married	.81	.87	.77
Public assistance-income (\$)	322.50	111.62	129.09
Family wealth (\$)	101.00	208.60	518.80
Children over six	.29	.32	.31
Children under six	.44	.32	.16
Immigrant (1960s)	.36	.25	.29
Immigrant (1950s)	.13	.08	.31
Immigrant (pre-50)	.06	.03	.24
Rural dweller	.04	.02	.07
	Mexican .70	Iranian .03	Dutch .04
	Dominican .08	Arabs .05	Scots .04
	Spaniard .13	Indian .09	French .06
	Salvadoran .04	Chinese .28	German .21
	—	Japanese .15	Greek .04
	—	Filipinos .24	Irish .09
	—	Vietnamese .04	Italian .18
	—	—	Hungarian .04
	—	—	Polish .07
	—	—	Russian .05
Reference	Cuban	Korean	English
Observations	2169	1388	2420

Note : Figures are expressed in ratios except otherwise indicated.

with higher education are expected to have a higher participation rate in the labor force (Gronau, 1974). Education has a positive and significant effect on the labor force participation of at least two of the three groups of women immigrants—Hispanics and Europeans. Labor force participation of these noted two groups increases with age, a proxy for workers' labor market experience, but at a decreasing rate. Immigrant women come with little and diverse experience which may or may not be relevant to the U.S. labor market. As they assimilate to the U.S. job culture, their labor force participation increases. Immigrants of the 1950s, in all the three continental groups, are more likely to participate in the labor force relative to their reference groups of most recent cohort (1970s). Workers' health disability status works negatively on their labor force participation.

Consistent with theory, marital status has a negative effect on women's labor force participation of all the three groups. But, coefficients are not significant for those who are relatively highly educated such as Asians and Europeans. Note that the effect of marital status may also vary in part according to the husbands' education and income. Highly educated women are probably, on average, married to their highly educated self-selected men. Housewives' reservation wage increases or their desire to work decreases, in other words, with husbands' education, a proxy for their husbands' education and wives' working status is born out in all the three continental groups of women, and is significant at least for those with highly educated husbands—Asians and Europeans. For the similar reason, public assistance income has a negative and statistically significant effect on immigrant women's labor force participation without any exception in this study. The presence of Children is a major constraint on women's labor force participation (Becker, 1985 ; Dowdall, 1974 ; Gramm, 1975 ; and Shaw, 1983). The presence of children increases the demand for the mother's time at home and reduces her tendency to participate in the labor force. This constraint becomes stronger for those women who have young children. For example, the absolute magnitudes of dummy coefficients for children under six in each group of immigrant women are higher than those for children over six. The presence of children inhibits the labor force participation of European women significantly more than the two other groups. Perhaps some form of extended family arrangement in non-white communities provides a ready source of child care for working mothers (Oaxaca, 1973).

Table 2 : Linear Probability Estimates of Labor Force Participation Models by Continental Groups of Immigrant Women of Age 20-64 : 1980 Census

Variables	Hispanic		Asian		European	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant	.168	1.2	.393**	2.1	.459**	2.8
Education	.009**	3.1	.0025	0.7	.007**	2.1
Age	.031**	3.1	.0025	0.1	.007**	2.0
Age square	-.0004**	-4.3	-.0004**	-3.1	-.0003**	-4.3
Husbands' edu.	-.0009	-0.3	-.007**	-2.1	-.009**	-3.2
English prof.	.018	0.7	.027	1.0	.011	0.4
Health disb.	-.203**	-4.7	-.091	-1.4	-.314**	-9.0
Married	-.123**	-2.2	-.045	-0.7	-.086	-1.3
Wealth ^b	.003	0.4	.0002	0.2	-.0003	-0.8
Public assistance income ^c	-.08**	-8.7	-.007**	-3.6	-.007**	-4.9
Children-O-6	-.06**	-2.2	-.09**	-2.8	-.119**	-4.8
Children-U-6	-.128**	-4.2	-.212**	-6.2	-.317**	-9.3
Migrants (60s)	-.046**	-1.9	.070**	2.4	.073**	2.4
Migrants(50s)	.096**	2.7	.116**	2.4	.097**	3.1
Migrants(pre-50)	-.035	-0.7	-.007	-0.1	.023	0.6
Rural dweller	.052	1.1	-.059	-0.7	-.113**	-3.2
Hispanics :						
Mexicans	.003	0.1	—	—	—	—
Dominicans	-.061	-1.0	—	—	—	—
Spaniards	-.082	-1.5	—	—	—	—
Salvadorans	.059	0.9	—	—	—	—
Asians :						
Iranians	—	—	-.361**	-4.9	—	—
Arabs	—	—	-.223**	-3.5	—	—
Indians	—	—	.031	0.6	—	—
Chinese	—	—	.013	0.3	—	—
Japanese	—	—	-.24**	-5.0	—	—
Filipino	—	—	.168**	3.8	—	—
Vietnamese	—	—	.057	.81	—	—
Europeans :						
Dutch	—	—	—	—	-.020	-0.4
Scots	—	—	—	—	.131**	2.6
French	—	—	—	—	-.05	-1.2
Germans	—	—	—	—	-.014	-0.5
Greeks	—	—	—	—	-.147**	-2.8
Irish	—	—	—	—	.049	1.3
Italians	—	—	—	—	.018	0.5
Hungarians	—	—	—	—	.041	0.8
Polish	—	—	—	—	.049	1.2
Russians	—	—	—	—	.045	0.9
Reference	Cubans	—	Koreans	—	English	—
Observations	2169	—	1388	—	2420	—

** Note : ** Significant at .05 level

^b Coefficients must be divided by 1000.

^c Coefficients must be divided by 1000.

— Not applicable.

Sub-groups of immigrant women by their country-of-origin may also differ within each continent group in joining the labor force due to differences in factors not known to us—country specific traits, attitudes, values, religion, and cultural factors.⁷ This study attempts to explain as to how the Hispanic group of female immigrants lag behind the two other major counterparts, e.g., Asians and Europeans in their U.S. earnings. The reasons for differences in earnings between immigrant groups of women can be explained by immigration theory as well as the differences in immigrants' human capital. It is argued that Asian and European immigrants come from distant countries, incur higher transportation and psychic costs, face stiffer international barriers, and take a relatively greater risk in immigrating to the U.S.⁸ Distant immigrants thus expect higher earnings in the U.S. relative to those who have come from countries neighboring the U.S. Asian, and European immigrants are, therefore, expected to have higher levels of market characteristics as well as higher rates of return to these characteristics.

Table 3 presents the means of variables of earnings model by continental groups of immigrant women of age 20-64. Note that data in this table are limited to working immigrant women. This table illustrates how the three major groups of immigrant women studied here differ from each other in their personal, family, and market characteristics pertinent to their earnings. European immigrant women over the past decades are dominated by

7. For example, as tested by dummies for immigrants' country-of-origin within each continent, traditional Japanese housewives in the U.S. are less likely to be in the labor force in comparison to their reference group of Koreans. Filipino women are more likely to be in the labor force. Note that Filipino women have a relative advantage in spoken English, which helps them to adapt to the U.S. job culture at a faster rate (country wise education and other data are not presented here). A few of Arab and Iranian women participate in the labor force. Among European immigrants women in the U.S., relatively highly educated Scottish women are more likely to participate in the labor force compared to English women. The less educated European women such as Greeks are also less likely to participate in the work force. Other women immigrants from Europe do not differ significantly from English in their willingness to work. Similarly, Hispanic sub-groups of immigrant women by their country-of-origin do not differ significantly from Cuban women at least to participate in the U.S. labor force.

8. Several hypotheses relating to migration are drawn in Schwartz (1973). More educated individuals are relatively less risk-averse, gain more information on faraway jobs, and move longer distances. Psychic and other costs of migration increase with distance. See Aba Schwartz, "Migration, Age, and Earnings," *Journal of Political Economy*, Volume 84, no. 4, pt. 1 (1976) pp. 701-719.

Table 3 : Mean Variables of Earnings Model by Continental Groups of Immigrant Women of Age 20-64 : 1980 Census

Variables	Hispanics	Asians	Europeans
lnY(\$)	1.25	1.53	1.51
Earnings/hour	3.49	4.61	4.52
L (Selection term)	-.36	-.35	-.34
Education (year)	8.28	12.75	11.79
Experience (year)	22.74	19.15	26.26
Experience - square (year)	672.69	501.10	837.41
English proficiency	.25	.48	.78
Health disability	.04	.03	.04
Married	.77	.84	.73
Husband present- and working	.24	.30	.36
Family wealth (\$)	104.30	235.90	518.67
Self-employed	.03	.07	.07
Informal sector	.61	.33	.30
Immigrant (1960s)	.37	.27	.30
Immigrant (1950s)	.15	.09	.33
Immigrant (pre-50)	.06	.03	.21
Rural dweller	.05	.02	.06
California	.24	.31	.18
	Mexican .70	Iranian .01	Dutch .04
	Dominican .07	Arabs .04	Scots .05
	Spaniard .13	Indian .09	French .06
	Salvadoran .05	Chinese .30	German .21
	—	Japanese .11	Greek .03
	—	Filipinos .31	Irish .09
	—	Vietnamese .04	Italian .18
	—	—	Hungarian .04
	—	—	Polish .10
	—	—	Russian .04
Reference	Cuban	Korean	English
Observations	1291	922	1502

Note : Figures are expressed in ratios except otherwise indicated.

German, Italian, Polish, and Irish. European immigrant women are mostly of upper middle age. For example, 54 percent of working women immigrants of European origin came to the U.S. before 1960. Thus, they have been able to acquire the highest level of labor market experience in the U.S. They are, however, moderately educated as measured by 12 years of schooling, on average, compared to 13 years for Asians and 8 years for Hispanics. European immigrant women have, however, the highest level of English proficiency and family wealth. The family wealth is measured by dividends, royalty and interest payment data of the Census. Seventy eight percent of these working immigrants of European origin were reported to speak English very well. They are also lowest in number who work for the low productivity sector (such as services, farming, fisheries, and operatives) in the U.S.

Asian immigrant women over past years are dominated by Filipinos, Chinese, and Japanese. They are relatively young, and are most recent immigrants to the U.S. only 12 percent of these women immigrants of Asian origin came to the U.S. before 1960. Asian women workers are previously reported to have the highest level of education, and moderate level of English proficiency and family wealth. For example, about 18 percent of Asian immigrants were reported to speak English very well compared to 25 percent of Hispanics and 78 percent of Europeans. Concentration of Asian women workers between low-and high productivity jobs tends to be very similar to that of European women workers in the U.S.

Hispanic women immigrants are mostly descendants of Mexico, who immigrated to neighboring America. As much as 70 percent of Hispanic women workers in the U.S. are constituted by those of Mexican origin. Twenty-one percent of elderly Hispanic women workers came to the U.S. before 1960. Thus, Hispanics have little more work experience specific to the U.S. than Asians. Hispanic women workers have the lowest level of education. English proficiency and family wealth among the three major groups of foreign women workers are also studied here. Furthermore, a large number of Hispanic women, approximately 61 percent, worked for the low productivity sector in the U.S.

Table 4 presents the estimate of earnings model of continental groups of immigrant women of age 20-64. This table shows what

determines the labor earnings. In support of human capital theory, education has a positive and significant effect on labor earnings of relatively highly educated Asian and European immigrant women at least. The earnings functions of more educated persons dominate those of less educated persons soon after they complete their formal education, Becker (1974). Probably the quality and quantity of education go hand in hand. For example, those immigrant women who have the highest level of education, such as Asians, also receive the highest return to education, 5.9 percent compared to 4.5 percent for Europeans. Hispanic women immigrants' level of education, which is noted as relatively low, does not have any significant influence on their selectivity-corrected-earnings in the U.S. It may also be noted that the formal education is not very important in the nonprofessional jobs, where as much as 61 percent of Hispanic women workers are employed. Also, our classification of low and high productivity sectors is too broad to control the effect of occupational-mix on individual's earnings.

This study once again shows that our traditional measure of work experience, age and education, is not a good proxy for immigrant women's labor market experience. Note that women's child bearing and household responsibility, and discontinuous work behavior are all that restrict us to precisely measure women's work experience, and are possible reasons for experience coefficients not being significant. One should not conclude from lower t-values that experience is not productive in women's labor market work.⁹ Controlling total experience, the coefficients of assimilation variables (as measured by immigration cohorts of 1960s, 1950s, and Pre-50) capture the differential impact of U.S. specific labor market experience on earnings. In support of Chiswick and others, the partial effect of assimilation variables on earnings is positive for all cohort dummies, though not all are significant.

9 For example, after including age structure of children in women's earnings equation, women's age, age square, which are proxies for women's experience and experience square, become statistically significant (Long, 1980). Further, in earnings equations of Heckman (1974) and Oaxaca (1973), the effects of child bearing, a control variable for women's experience at least in part, narrow the earnings differentials of white with Mexican - and black women. Also, note that a strong multicollinearity between experience and experience square cannot be avoided.

Table 4 : Selectivity-corrected Estimates of Earnings Model by Continental Groups of Immigrant Women of Age 20-64 : 1980 Census

Variables	Hispanics	Asians	Europeans
Constant (\$)	.710** (7.40)	.613** (3.20)	.916** (5.10)
L (Selection term)	1.280** (4.70)	.042 (.14)	.320 (1.45)
Education (year)	.010 (1.26)	.059** (7.07)	.045** (5.20)
Experience (year)	-.0076 (-.91)	.008 (1.00)	.0014 (.18)
Experience - square (year) ^b	.002 (.15)	-.020 (-1.28)	-.008 (-.58)
English proficiency	.103* (1.64)	.174** (2.90)	.114* (1.73)
Health disability	-.267** (-1.99)	-.464** (-3.01)	-.294** (-2.35)
Married	.141* (1.77)	.046 (.43)	-.140* (-1.58)
Husband ^d present- and working	-.096* (-1.64)	-.074 (-1.15)	.006 (.09)
Family wealth (\$) ^c	.001 (.65)	.007** (2.67)	.0005 (.69)
Self-employed	.134 (.98)	.180* (1.68)	.069 (.80)
Informal sector	.230** (4.5)	.053 (.85)	.075 (1.49)
Migrants (1960s)	.050 (.87)	.104* (1.58)	.090 (1.38)
Migrants (1950s)	.064 (.78)	.062 (.60)	.046 (.60)
Migrants (pre-50)	.240** (1.98)	.032 (0.18)	.210** (2.36)
Rural dweller	.190* (1.69)	.047 (0.25)	-.013 (-0.14)

Variables	Hispanics	Asians	Europeans
California	.075 (1.37)	.087 (1.56)	.200** (3.40)
- .290** Mexican	(-2.70)	-.270 Iranian (-1.10)	.040 Dutch (0.37)
-.260** Dominican	(-1.97)	.007 Arabs (0.04)	-.110 Scots (-0.90)
-.075 Spaniard	(-0.64)	-.210* Indian (-1.76)	.164* French (1.61)
-.529** Salvadoran	(-3.56)	-.03 Chinese (-.37)	.03 German (.42)
—	—	-.080 Japanese (-.61)	.210 Greek (1.48)
—	—	-.060 Filipino (-0.61)	.053 Irish (0.61)
—	—	-.056 Vietnamese (-.38)	.125 Italians (1.50)
—	—	—	.180 Hungarian (1.48)
—	—	—	.125 Polish (1.30)
—	—	—	.038 Russian (.33)
Reference	Cubans	Koreans	English
Observations	1291	922	1502

Note : Not applicable. —

Note : Figures in parentheses are t-values ; ** significant at .05 level,

*significant at .10 level.

b Coefficients must be divided by 1000.

c Coefficients must be divided by 1000.

As expected, those who speak English very well earn significantly more than those who speak little English. According to Tienda (1982), individuals most proficient in English have higher than average economic status level. Differences in earnings between the two groups of workers, one who speaks English very well and the other who speak little English within each continent, seem to be higher for Asians as measured by their dummy coefficient of 17 percent compared to 10 percent for Hispanics and 11 percent for Europeans. Physically disabled immigrant women barely earn 50 percent of income earned by immigrant individuals of good health. Dummy coefficients of health disability status are, as one would expect, negative and statistically significant for all the three groups of women immigrants.

According to the marriage theory,¹⁰ married women specializing in home production become relatively less efficient in the labor market. Thus, married women earn less than unmarried. In this study, the comparison of earnings between married and unmarried women is, however, not free from ambiguity. As predicted by theory, married dummy coefficient is negative and significant for Europeans. Married women immigrants of European origin earned 14 percent less than their unmarried counterparts. But married dummy coefficient is positive and significant for Hispanics, and is insignificant for Asians. This result is not surprising because earnings losses of married women across the ethnic groups may not be the same. Also, the married dummy variable may be interrelated to the other dummy variable of the model for those who are married, husband present and working. As expected, the latter dummy is also negative for all the three groups and significant at least for Hispanic women immigrants. This indicates lower earnings for those Hispanic women who are married, husband present and working compared to those who are married, husband not present and married, husband present and not working. If the Hispanic spouse has a job in the labor market, that may limit the extent of subject's labor market specialization as well as earnings (Kenny, 1983)¹¹

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10. Married men are able to earn more than unmarried because one with spouse present are able to specialize to a larger extent in the market production. Further, married men would have a greater commitment to the labor force than unmarried men.
 11. Both these above noted dummy variables are, however, insignificant for Asian women immigrants. Thus, Asian husband-wife time inputs are neither substitutes nor complements in the U.S.

Family wealth is a proxy for family's affluence, nepotism, family connection which probably favour one group of workers in the job against the other (Heckman, 1974 ; and Taubman, 1975).¹² As expected, family wealth variable is positive for all the three groups of continental women, but statistically significant for Asians only. Self-employed workers probably have more control over their resources and, thus, are expected to earn more than those who work for others. Our results are also positive for all the three continental groups of women workers, and statistically significant for Asians. While our sample mostly consists of urban dweller, almost all of Asian immigrant women live in urban areas. According to Blau (1985), self-employed workers appear to have higher earnings than their wage employees counterparts in urban areas. In contrast, the self-employed in rural areas often are found to earn less than the wage employees with similar characteristics (Blau, 1985).

Those Hispanic women immigrants who work in the low productivity or informal sectors do surprisingly better than their formal sector counterparts due to the reason not clear to us. Note that formal sector employment needs relatively high levels of skills, knowledge and education. It is possible that Hispanic women work at the lower strata also in our broadly classified formal sector. Similarly, Hispanic workers of rural sectors earn relatively more than their urban sector counterparts. Probably Hispanics are relatively more productive in the rural and informal sectors. These sectoral dummies generally matter very little for highly educated Asian and European female workers in their U.S. earnings.

Labor earnings do not differ much between sub-groups of foreign women workers in the U.S. by their country-of-origin, at least within Asian and European continent. None of the country dummies for Asian and European groups of immigrant women workers are statistically significant at .05 level. Hispanic sub-groups of women workers, however, differ significantly in their U.S. earnings by their country-of-origin. As indicated by country dummies, Spaniard and Cuban women in the U.S. have higher earnings than other Hispanics—Mexicans, Dominicans and Salvadorans,¹³ Note that Spaniards are distant immigrants, incur

12. Heckman (1974) found a positive effect of non-wage income on women's reservation wage.

13. Earnings of Spaniard women do not differ significantly from their reference group of Cubans.

higher transportation and psychic cost, and take higher risk of uprootedness from their country-of-origin when immigrating to the U.S. Therefore, Spaniard immigrants expect higher earnings than other Hispanics who came from countries neighboring the U.S. Cuban women are from a country of more egalitarian income distribution where high income people are heavily taxed and low income people are subsidized. Cuban women in the U.S. are probably from the upper tail of their income class in Cuba. Thus, Cubans expect to have higher earnings in the U.S. compared to the other Hispanics from free countries (Borjas, 1987).

Table 5 decomposes the differences in earnings between Asian, Hispanic and European immigrant groups of women as a percentage of earnings of the latter group. As explained before, labor market characteristics of working women within Asian and European groups do not differ much from their respective counterparts who are not in the work force. The difference in observed earnings between Asian and European immigrant groups of women is not expected to differ much from the difference in their selectivity-corrected earnings. Accordingly, the effects of different characteristics (both levels and returns) on selectivity-corrected earnings of Asian and European women are mainly off-setting, in as much as the total net effect in line (3) and (6) is quite small (-.099 and + .066). Higher levels of both the total and U.S.-specific work experience and English proficiency cause a relative earnings advantage of .099 percent in favor of European immigrant women. Had the Asian immigrant women received the same level of work experience and English proficiency as the Europeans, the relative earnings of the former would rise by .066 percent. Earnings advantages of higher levels and returns to education for Asians and of higher levels of work experience and English proficiency for Europeans are thus mostly off-setting.

Since the earnings of Hispanic women are not free from selectivity-bias, their selectivity-corrected relative earnings are much lower than those of Europeans. Hispanics have 90 percent lower earnings than Europeans (compared to 26 percent in observed earnings), 29 percent due to Hispanics' lower levels of characteristics and 70 percent due to their lower returns to characteristics. Had the Hispanic women received the same return as Europeans, the earnings difference would fall to 29 percent. Hispanic women's lower levels of education, poorer English, and thus their less productive work experience are

Table 5 : Differences Between Earnings of Asian, Hispanic, And European Immigrants as a Percentage of Earnings of European Immigrants ^a

Components of differentials	Asians	Hispanics
1. Observed earnings differences (%)	+.020	-.26
2. Selectivity corrected earnings differences (%)	-.033	-.990
3. Earnings differences due to characteristics differentials : 0.5 (3a + 3b) (%)	-.099	-.288
a. $-(\sum b_E X_E - \sum b_T X_T)$	-.101	-.297
b. $-(\sum b_T X_E - \sum b_T X_T)$	-.097	-.279
4. Earnings differences due to parameters : 0.5 (4a + 4b) (%)	+.066	-.703
a. $-(\sum b_E X_E - \sum b_T X_E)$	+.065	-.712
b. $-(\sum b_E X_T - \sum b_T X_T)$	+.068	-.694
5. Earnings differences due to characteristics & parametric differentials : [3 + 4]	-.033	-.990

a. Note.-*E stands for European immigrants and T for the other immigrants, b_E and b_T are coefficients of European and the other immigrants' earnings functions. X_E and X_T are characteristics of European and the other immigrants. Earnings differences are calculated as $-(\$_E - \$_T)/\$_T$.

probable reasons for their average lower productivity in the U.S. labor market (relative to the two other groups of immigrant women).

V. Summary and Conclusions

Asian and European immigrants come from distant countries, incur higher transportation and psychic costs, face stiffer international barriers, and take a relatively greater risk of uprootedness from their country-of-origin in immigrating to the U.S. Distant immigrants expect higher earnings in the U.S. than Hispanics. Among the three major groups of female immigrants—Hispanics, Asians, and Europeans—the former has the lowest level of labor force participation and earnings. Hispanic women, a large majority of which are Mexican descendants, are the poorest in English proficiency, have the lowest level of education and a few inherited or acquired endowment of family wealth. More importantly, Hispanic women are more likely to have young children and receive relatively more public assistance income. With such a set of unfavorable labor market characteristics, Hispanic women mostly work in the low productivity sector in the U.S., receive the lowest returns to their human capital and, thus, have the lowest earnings compared to Asians and Europeans. Earnings do not differ much between Asian and European immigrant women. While Asian women in the U.S. reap relatively more returns to their higher levels of human capital, European women have fairly high levels of education and the advantage of their higher levels of work experience and English proficiency. The effects of different characteristics (both levels and returns) on earnings of Asian and European women with or without selectivity-correction are, therefore, mainly off-setting.

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