IMMIGRANTS, MINORITIES, AND LABOR MARKET COMPETITION

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This paper investigates the extent of labor market competition among immigrants, minorities, and the native population. An analysis of 1980 U.S. Census data reveals that immigrants tend to be substitutes for some labor market groups and complements for others. The effects of shifts in immigrant supply on the earnings of native-born men are, however, very small. On the other hand, increases in the supply of immigrants do have a sizable impact on the earnings of immigrants themselves: an increase of 10 percent in the supply of immigrants, for example, reduces the immigrant wage by about 10 percent.

THE literature on the economics of immigration has, in the past decade, been dominated by analyses of two questions: How do immigrants do *in* the U.S. labor market and what do immigrants do *to* the U.S. labor market? Beginning with the work of Chiswick (1978), most of the empirical studies have focused on the first of these issues (see also Borjas 1985). The literature on the second question is much less developed. Little is known about the labor market adjustments caused by the large influx of immigrants in the last twenty years. Some studies (e.g., Johnson 1980) have constructed theoretical models of the labor market interaction between the native- and the foreign-born populations. In effect, these models build on the basic assumption that the two groups are substitutes in production, even though the type of technological relationship between the two groups is *entirely* an empirical question.

The empirical determination of the extent of substitutability or complementarity between any two labor inputs is, of course, based on neoclassical input demand theory. The main methodological tool of such studies is the estimation of the production technology in which various race, gender, and other (demographically defined) labor inputs, as well as capital, enter as inputs in the production process (see Borjas 1983; Grant and Hamermesh 1981; and the survey by Hamermesh, 1986). The parameters of the production technology provide important information about the technological relationships among the various inputs, and are used to infer the extent of substitutability or complementarity between any two inputs.

This framework has been used to study the relationship between native- and foreign-born workers by Borjas (1986a, 1986b) and Grossman (1982). Despite major differences in methodological approach and in the data sets analyzed, these studies conclude that immigrants have a very small numerical impact on the earnings of the native-born population.[1] These studies,

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[1]One crucial difference between the Borjas and Grossman studies is the use of different functional

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however, aggregate rather different immigrant groups (Mexicans, Vietnamese, Chinese, Cubans, Italians, etc.) into a single population. Since it is well known that the national origin of the immigrant population (as well as the racial/ethnic background of native-born men) is an important characteristic in the determination of earnings, the conclusion that immigrants have had little impact on native earnings may well be masking important country- or race-specific distinctions in the extent of substitutability. This paper presents estimates of the extent of labor market competition between immigrants and natives in which both populations have been disaggregated by race and ethnic origins.

Framework

Assume that the production technology is characterized by the Generalized Leontief production function (Diewert 1971):

$$(1) \qquad Q = \sum_j \sum_i \gamma_{ij}(X_i X_j)^{1/2},$$

where Q is output, X_i is the quantity of input i, and γ_{ij} is the technology coefficient. The production function in (1) is linearly homogeneous and restricts the values of the technology parameters so that $\gamma_{ij} = \gamma_{ji}$.[2] The sign of γ_{ij} determines whether inputs i and j are substitutes ($\gamma_{ij} < 0$) or complements ($\gamma_{ij} > 0$).

The assumption that firms in the labor market maximize profits and face constant input prices leads to the following system of labor demand functions:

$$(2) \qquad r_i = \gamma_{ii} + \sum_{j \neq i} \gamma_{ij}(X_j/X_i)^{1/2}.$$

The system of equations in (2) illustrates the usefulness of the Generalized Leontief functional form: wage equations are linear-in-parameters and hence can be easily estimated by standard least squares techniques. Further, the functional form in (2) provides an intuitive understanding of the underlying process. In particular, the wage of group i, r_i, is affected by the number of type j individuals in the labor market *per* member of group i (X_j/X_i). Thus, the relative quantities of other factors of production affect group i's wage through the technology parameter γ_{ij}, and when group i is complementary (substitutable) with group j, an increase in the supply of group j increases (decreases) group i's wage. Finally, the simplicity of the wage equation arising from the production function (1) indicates that the Generalized Leontief technology may provide a much-needed link between demand theory and the many studies of wage determination in the literature.

Although the signs of the parameters γ_{ij} contain useful information about the possibilities for technical substitution among the n inputs, it is instructive to transform these parameters into quantities that are more tractable. Let us define the Hicks partial elasticity of complementarity (Hicks 1970):

$$(3) \qquad c_{ij} = \frac{QQ_{ij}}{Q_i Q_j}$$

where $Q_i = \partial Q/\partial X_i, Q_{ij} = \partial^2 Q/\partial X_i \partial X_j$. The Hicks elasticity of complementarity measures the effect on the relative price of factor i of a change in the relative quantity of factor j, holding constant the marginal cost and the quantities of other factors. Since the analysis in this paper is mainly concerned with estimating the impact of changes in the supply of immigrants on the earnings of the native-born population, the elasticity of complementarity (rather than its dual, the elasticity of substitution) is the natural measure to quantify this impact.

A useful property of the elasticity of complementarity is given by:

forms (the Generalized Leontief versus the translog) to describe the production process. There is no *a priori* reason to prefer one function over the other, since both are second-order approximations to any arbitrary production function. Moreover, experiments by Griffin (1982) and Wales (1977) show that the translog function provides a better fit over certain ranges of data and the Generalized Leontief equation over others.

[2] In addition, diminishing marginal productivity for input l requires that not all $\gamma_{lj} (j = 1, \ldots, l-1, l+1, \ldots, n)$ be negative. For a discussion of this and other related restrictions see Diewert (1971) and Sato and Koizumi (1973).

$$(4) \qquad \frac{d \ln r_i}{d \ln X_j} = s_j c_{ij},$$

where $s_j = r_j X_j / Q$, the relative share of income accruing to factor j. Hence the elasticity of factor price ($d\ln r_i / d\ln X_j$), which measures the percentage change on the earnings of group i due to a one-percent increase in the supply of group j, is proportional to the elasticity of complementarity. Knowledge of the elasticities of complementarity, therefore, provides a complete picture of price shifts occurring among the native-born as a result of a supply shift in the immigrant population.

It can be shown that under the Generalized Leontief technology, the elasticities of complementarity are given by:

$$(5) \qquad c_{ij} = \frac{\gamma_{ij}}{2(s_i s_j r_i r_j)^{1/2}} \quad \text{for } i \neq j,$$

and

$$(6) \qquad c_{ii} = \frac{\gamma_{ii} - r_i}{2 s_i r_i} \quad \text{for } i = j.$$

As implied by the earlier discussion, the sign of γ_{ij} determines the sign of the (cross) elasticity of complementarity, which, in turn, determines the sign of the elasticity of factor price.

The estimation of the demand system in (2) is affected by two major econometric problems. First, equations (2) are not wage-determination functions unless (relative) supply conditions are also specified. It is common in the input demand literature (see, for example, Grant and Hamermesh 1981:355) to estimate the production technology under the assumption that input supply is exogenous. The usual justification for this assumption is that the supplies of age-specific sex/race groups are essentially fixed at any given time. But this assumption ignores the fact that although the total stock of specific labor inputs may be treated as fixed, its distribution across labor markets is likely to be guided by input price differentials. In the empirical analysis below, the assumption of inelastic relative supplies will be used, and the sensitivity of the results to more complex supply models will be addressed.

The second econometric problem that has been ignored in the labor demand literature concerns the aggregation of workers into the labor inputs X_i. An implicit assumption in specifying production functions such as (1) is that all group i workers are homogeneous within *and* across labor markets. Of course, individuals within each of these groups vary markedly in skills, and these differences may lead to group i individuals having different average skills across different labor markets. Hence wage differentials across labor markets may simply reflect an unequal distribution of skill levels, seriously biasing the estimates of the production function.

This problem can be approached (in the Generalized Leontief framework) by characterizing an individual's effective labor supply in terms of a fixed effect indicating the skill level of the individual. In particular, the wage paid to individual l in group i, r_{il}, depends on: (a) the market-determined wage level for the average group i person, r_i; and (b) how the skills of individual l differ from the skills of the average group i person, f_l. Hence, in general, $r_{il} = r_{il}(w_i, f_l)$, and the individual's wage rate depends both on market forces and on his (relative) skill level.

To make this approach useful it is necessary to add structure to the model. Two possible simplifications are $r_{il} = r_i f_l$ and $r_{il} = r_i + f_l$. The additive fixed effect assumes that the wage premium due to differential skills is independent of the demographic characteristics of the labor market, whereas the multiplicative specification allows for the possibility of an interaction.[3] For simplicity, the analysis in this paper uses the additive specification. If it is assumed that f_l can be written in terms both of observable socioeconomic characteristics, Z_l, and a random uncorrelated error, ϵ_l, the stochastic equivalent of (5) is given by:

[3]Note that the definition of the fixed effect requires that $E(f_l)$ equal one in the multiplicative specification and zero in the additive model.

$$(7) \quad r_{il} = Z_l\beta_i + \sum_{j \neq i} \gamma_{ij} (X_j/X_i)^{1/2} + \epsilon_l, \qquad i = 1, \ldots, n.$$

Equation (7) specifies the wage-determination process at the individual level and will be used throughout the empirical analysis. It is important to note that estimates of the demand system in (7) control for observable differences in socioeconomic variables *within* each of the labor inputs, but do not control for differences in these variables across the groups. It is these differences in socioeconomic variables, as well as differences in unobserved characteristics captured by the error term, that prevent the production technology from degenerating into a system in which all inputs are perfect substitutes.

Data and Basic Results

The data set used in the analysis is the 1980 5/100 A Sample from the U.S. Census.[4] The analysis was restricted to working-age individuals (18–64 years) who (a) were not in the military, (b) were not self-employed or working without pay, and (c) had records containing complete information on the variables used in the analysis. The "local labor market" is defined to be the SMSA in which the individual resides.

To account for the differences in ethnicity and race among persons, as well as for the difference between native- and foreign-born status, the analysis is initially conducted using a nine-way breakdown of the labor force: white native males (WN), black native males (BN), Hispanic native males (HN), Asian native males (AN), white immigrant males (WI), black immigrant males (BI), Hispanic immigrant males (HI), Asian immigrant males (AI), and females (F).

Three points should be made regarding this particular decomposition of the labor force. First, the analysis allows for the disaggregation of the four largest racial/ethnic groups that can be identified in the 1980 Census. Second, all women are aggregated into one group because previous research (e.g., Smith 1977) shows that earnings differentials among different types of women are much narrower than earnings differentials among different types of men. This fact suggests that employer differentiation of women is likely to be less important than employer differentiation of men. Finally, the samples defined as "white" contain all non-black, non-Asian, non-Hispanic observations.

The employment data necessary for the estimation of equations (2) were obtained from the Census files. The labor input X_i (in the SMSA) is defined as the number of individuals in group i who were of working age and were employed in 1979. Finally, the capital (K) data are drawn from Grant (1979), who calculated the capital stock in each of 84 SMSAs for the ten years up to 1969 using the *Census of Manufactures* and the *Annual Survey of Manufactures*.[5] The capital data used below, for 1979, are extrapolated from the time-series.[6]

It is well known that capital stock calculations are subject to large measurement errors. To complicate matters, the capital data are available only for manufacturing industries. Since the analysis in this paper is conducted over all industries, the capital data lead to biased parameter estimates unless it is assumed that the aggregate capital stock in the SMSA is (roughly) proportional to the manufacturing capital stock. Because the capital data are available for only 84 SMSAs, the analysis is restricted to persons residing in these labor markets.

Before proceeding to the estimation of the demand system, it is useful to present summary statistics on the earnings and relative sizes of the nine labor groups under

[4]Since the Census data set is quite large, random samples were drawn for some of the larger population groups. The sampling proportions used are available from the author on request.

[5]The 84 SMSAs used by Grant (1979) to construct the capital time series are not a random sample of the 310 SMSAs identified in the A sample of the 1980 Census; they tend, rather, to be the largest SMSAs in the country.

[6]The analysis also experimented with using the 1969 level of the capital stock, rather than the 1979 extrapolation made from the 1959–1969 trend. The impact of this change in the definition of the capital variable on the estimated coefficients was trivial.

Table 1. Summary Statistics: Labor Force Characteristics of Native and Immigrant Groups.

Group	*Mean 1979 Annual Earnings*	*Percent of Labor Force*	*Number of Observations*
White Native Men	$18,892	42.6	5,831
Black Native Men	13,660	5.2	4,136
Hisp. Native Men	13,702	2.5	25,726
Asian Native Men	18,393	.3	4,247
White Immigrant Men	20,293	2.3	1,902
Black Immigrant Men	12,261	.3	1,747
Hisp. Immigrant Men	11,600	2.3	23,253
Asian Immigrant Men	16,487	.8	13,557
Women	9,305	43.7	62,710

Source: 1980 U.S. Census of Population, A Sample.

study. Table 1 presents these basic statistics, which illustrate the well-known differences in earnings across the groups and also show how the large Hispanic immigration is creating a labor force with almost as many Hispanics as blacks.

Equation (2) was estimated on the micro Census data using 1979 annual earnings as the dependent variable. The estimation was conducted by stacking the data for all nine labor force groups (so that all the coefficients of the nine earnings functions were estimated jointly) and by simultaneously introducing the across-equation restrictions implied by the symmetry constraints. The use of annual earnings, instead of the wage rate, facilitates comparison between the results in this paper and those available in the labor demand literature that use the average income share in a given year to estimate translog equations.[7] The variables held constant in the vector Z include years of schooling, years of labor market experience (age-schooling-6), and years of labor market experience squared.

Table 2 presents the estimated technology parameters. Several findings are worth stressing. First, all immigrant groups have had a negative impact on the earnings of the white native-born population. Thus immigrants, as a group, are substitutes with the single largest demographic group in the labor force. Second, this strong degree of substitutability is *not* evident in the black native-born population. Table 2 provides no evidence that black native-born men have been adversely affected by white or Asian immigrants, and only marginal evidence that black natives and black or Hispanic immigrants are substitutes. Surprisingly, the technological relationship between black natives and white immigrants (who make up over 40 percent of the immigrant population) is one of strong complementarity. Finally, there is no evidence of substitutability between the Hispanic native-born population and the three other native-born groups under analysis (whites, blacks, and Asians). This result resembles the finding obtained by Borjas (1983) in his study of the 1976 Survey of Income and Education.

It is of substantial interest that the results in Table 2 show a technological relationship between black natives and white immigrants different from that between black natives and either Hispanic or black immigrants. In particular, the former relationship indicates complementary inputs, whereas the latter relationships indicate (weakly) substitutable inputs. These findings are consistent with the theoretical expectation that "like" inputs are more substitutable than "unlike" inputs. White immigrants, for instance, tend to originate in Western European countries and have high levels of education. On arrival in the United States these immigrants—unlike black natives—perform relatively well in the

[7]The study was replicated using the wage rate as the dependent variable, with similar qualitative results.

Table 2. Estimates of Technology Parameters (1980 Census).
(t-ratios in parentheses)

	BN	*HN*	*AN*	*WI*	*BI*	*HI*	*AI*	*F*	*K*
WN	−1158.6* (−4.56)	−.98.5 (−.90)	−120.0 (−.93)	−3972.7* (−10.62)	−527.1* (−2.68)	−396.5* (−3.46)	−586.8* (−4.33)	−1370.0* (−5.40)	1771.5* (7.68)
BN		−79.2 (−.74)	−156.5 (−1.37)	876.2* (2.34)	−287.6 (−1.72)	−149.9 (−1.44)	−9.9 (−.08)	482.6* (2.24)	549.4* (7.01)
HN			179.3 (1.29)	−425.4* (−2.45)	−1590.3* (−8.43)	278.9* (2.66)	686.4* (4.61)	−212.4* (−2.09)	247.6* (11.27)
AN				80.6 (.42)	−190.8 (−.64)	182.6 (1.48)	319.5 (.79)	−86.1 (−.58)	89.9* (3.84)
WI					1554.7* (5.32)	−84.4 (−.50)	890.1* (3.85)	4606.2* (14.72)	277.3* (2.28)
BI						129.7 (.82)	108.6 (.37)	639.8* (2.88)	34.4 (1.07)
HI							−722.7* (−5.30)	226.5 (1.80)	235.8 (1.80)
AI								438.6* (2.82)	105.0* (4.14)
F									−173.6* (−3.70)

Note: For an explanation of abbreviations, see the text.
*Significant at the 5 percent level.

labor market. Black and Hispanic immigrants, on the other hand, are characterized by low levels of education and—like black natives—do not perform well in the labor market. The finding in Table 2, therefore, implies that the impact of immigration on black natives is likely to shift over time as the skill composition of the immigrant population in the United States changes.

Greater insight into the substantive implications of these technological relationships can be gained by calculating the corresponding elasticities of factor prices, $d \ln r_i / d \ln X_j$, for the relevant technology parameters. Table 3 presents the estimated changes in the earnings of the four native-born male groups as the supplies of the four immigrant groups increase. These cross-elasticities of demand are most revealing for what they do *not* show. In particular, despite the statistical significance of many of the technological parameters, Table 3 does not show these effects to be numerically important. For example, the cross-elasticity of the earnings of white native-born men with respect to the quantity of white foreign-born men is −.025. This finding implies that a 10 percent increase in the supply of these immigrants decreases white native earnings by less than three-tenths of one percent, and that even a doubling in the number of these immigrants reduces white native earnings by only 2.5 percent.

This remarkable result is evident in each of the 16 elasticities presented in Table 3. None of the elasticities takes on a value exceeding |.03|. Thus, even if some immigrant groups compete with the native-born in the labor market, the numerical impact of this competition is trivial.

It is notable that a similar result was obtained by Grossman (1982). Using a different methodology (estimating translog production functions) and a different data set (the 1970 Census), Grossman estimated that a 10 percent increase in the number of immigrants reduces the native-born wage by between .2 and .3 percent (Grossman 1982:600). The similarity between two sets of findings so different in their derivation strengthens the conclusion that immigrants have not played a major role in the determination of wage levels for native-born men in recent years.

Table 3. Elasticities of Factor Prices (1980 Census).

With Respect to the Quantity of:	*The Change in the Wage of:*			
	WN	*BN*	*HN*	*AN*
WI	−.025*	.021*	−.015*	.006
	(−10.62)	(2.34)	(−2.45)	(.42)
BI	−.001*	−.003	−.021*	−.005
	(−2.68)	(−1.72)	(−8.43)	(−.64)
HI	−.002*	−.004	.010*	.013
	(−3.46)	(−1.44)	(2.69)	(1.48)
AI	−.002*	−.000	.014*	.013
	(−4.33)	(−.08)	(4.61)	(.79)

Note: For an explanation of abbreviations, see the text.
The t-ratios in parentheses refer to the technological parameter γ_{ij}.
*Significant at the 5 percent level.

Immigrants, however, have had a sizable impact on the determination of their *own* wage levels. Table 4 presents the set of price elasticities of demand describing what happens to the earnings of immigrant men as the quantities of immigrant men increase. These elasticities, on average, are much larger than the cross-elasticities between native earnings and immigrant supplies. In particular, the own-elasticities presented in Table 4 reveal that increases in the supply of type i immigrants significantly reduce the earnings of those immigrants. For example, a 10 percent increase in the number of white immigrants reduces the earnings of white immigrants by 10.9 percent; a 10 percent increase in the number of black immigrants reduces black immigrant earnings by 5.8 percent; a 10 percent increase in the number of Hispanic immigrants reduces Hispanic immigrant earnings by 13.9 percent; and a 10 percent increase in the number of Asian immigrants reduces Asian immigrant earnings by 7.9 percent.[8]

Extensions of the Empirical Analysis

Endogeneity of Supply

The validity of the assumption of inelastic labor supplies that is implicitly used in the estimation of the results in the previous section can be questioned. After all, the wage differentials created across labor markets by the interactions among labor inputs are likely to induce internal migration patterns whereby the groups move to areas in which they are likely to do relatively well. The presence of mobility costs or imperfect information (or both) suggests that the wage differentials do not vanish in the long run and that the correct estimation of (2) requires that the supply of inputs to labor markets be modeled more fully.

To account for the endogeneity of the supply variables, it is assumed that at the SMSA level relative supplies of labor inputs are affected by a vector of socioeconomic characteristics, A, describing the SMSA. Hence:

$$(8) \qquad (X_j/X_i)^{1/2} = A\beta + \epsilon$$

[8]One important criticism of these results—as well as of most of the labor demand literature—is that substantive findings are being obtained from across-SMSA correlations between wage levels and relative supplies. If, as is likely, some small groups are concentrated in a relatively few labor markets, "outlying" labor markets may play a relatively large role in the estimation procedure. Borjas (1986a), however, using the 1970 Census, shows that restricting the analysis to the few SMSAs containing relatively large numbers of minority groups (e.g., blacks or Hispanics) or to SMSAs in a particular region (e.g., the South) does not have a major impact on the estimated demand system.

Table 4. Elasticities of Factor Prices Within the Immigrant Population (1980 Census).

	The Change in the Wage of:			
With Respect to the Quantity of:	*WI*	*BI*	*HI*	*AI*
WI	−1.087*	.167*	−.004	.048*
	(−2.35)	(5.32)	(−.50)	(3.85)
BI	.015*	−.576	.002	.002
	(5.32)	(−1.48)	(.82)	(.37)
HI	−.002	.014	−1.395*	−.039*
	(−.50)	(.82)	(−1.97)	(−5.30)
AI	.012*	.007	−.018*	−.787
	(3.85)	(.37)	(−5.30)	(−1.88)

Note: For an explanation of abbreviations, see the text.

The t-ratios in parentheses refer to the technological parameter γ_{ij} for the cross-elasticities, and to $(\gamma_{ii} - r_i)$ for the own-elasticities.

*Significant at the 5 percent level.

The vector *A* includes the proportions of the labor force employed in each of the one-digit industry groups, the probability of receiving Supplementary Security Income (SSI) assistance (relative to the poverty rate), and the mean level of SSI payments (relative to the mean wage level in the SMSA).[9] The industrial composition of the SMSA is likely to affect supplies, since particular combinations of industrial concentrations will attract individuals with specific skills to the locality. Similarly, the chances of receiving a particular form of public assistance (SSI), *relative* to the SMSA's poverty rate, as well as the "real" levels of that assistance, measure the economic welfare of low income individuals in the SMSA. If the expected value of public assistance payments differs significantly across SMSAs, geographic differences in the location of racial or immigrant groups are likely to arise.

The demand system in (2) was reestimated using two stage least squares, and the resulting estimates are summarized in Table 5. This table parallels the cross-price elasticities presented in Table 3. A comparison of these two tables shows that the qualitative impact of immigrants on the earnings of the native-born is generally unaffected by the estimation procedure (except for the effects on black natives), although the 2SLS cross-price elasticities tend to be slightly larger than the corresponding OLS estimates. Despite the absolute increase in the numerical impact, however, it must be stressed that even the 2SLS elasticities predict numerically small impacts. For example, a 10 percent increase in the number of white immigrants reduces white native-born earnings by .4 percent according to the 2SLS regression and by .25 percent according to the OLS regression. Thus, even though the 2SLS technique roughly doubles the size of the cross-price elasticity, the numerical impact remains trivial.

The Heterogeneity of Hispanics

In the previous sections, male Hispanics have been disaggregated by nativity status rather than by national origin. There are four major national groups in the U.S. Hispanic population: Mexicans (MX), Puerto Ricans (PR); Cubans (CU); and "other" Hispanics (OS), mostly of Central and South American origin. Previous research (Reimers 1983; Borjas and Tienda 1985) has documented that differences in labor market outcomes across these four Hispanic groups are as large as, if not larger than,

[9]The industry composition variables were calculated from the 1980 Census file, and the public assistance variables were obtained from the 1976 Survey of Income and Education.

Table 5. Elasticities of Factor Prices (1980 Census), Adjusted for Endogeneity of Supply.

With Respect to the Quantity of:	*The Change in the Wage of:*			
	WN	*BN*	*HN*	*AN*
WI	−.042*	.024	−.005*	.030
	(−10.16)	(1.61)	(−3.78)	(.86)
BI	−.001	.005	−.017*	−.032*
	(−.82)	(1.55)	(−4.19)	(−2.00)
HI	.002	.014*	.024*	.010
	(1.11)	(2.91)	(4.19)	(.69)
AI	−.003	−.007	.025*	.020
	(−1.63)	(−1.86)	(4.28)	(.54)

Note: For an explanation of abbreviations, see the text.
The t-ratios in parentheses refer to the technological parameter γ_{ij}.
*Significant at the 5 percent level.

Table 6. Elasticities of Factor Prices Across Hispanic and Non-Hispanic Groups (1980 Census).

With Respect to the Quantity of:	*The Change in the Wage of:*					
	WN	*BN*	*AN*	*WI*	*BI*	*AI*
MX	−.003*	−.007*	−.002	−.004	−.003	−.004
	(−3.76)	(−2.19)	(−.28)	(−.94)	(−.19)	(−.69)
PR	.000	.004*	−.016	.005*	−.056*	.017*
	(.18)	(3.90)	(−1.49)	(2.29)	(−3.47)	(2.32)
CU	.001*	.004*	.010*	.006*	.024*	−.020*
	(2.42)	(3.36)	(2.09)	(2.81)	(2.44)	(−4.77)
OS	−.001*	.004	.004	.010*	−.134*	−.003
	(−2.17)	(.41)	(.75)	(3.17)	(−6.59)	(−.38)

Note: For an explanation of abbreviations, see the text.
The t-ratios in parentheses refer to the technological parameter γ_{ij}.
*Significant at the 5 percent level.

the differences by nativity status. These findings suggest that an alternative substantively important decomposition of the Hispanic labor force exists. The demand system in (2) was reestimated, using ordinary least squares, after replacing the Hispanic native and Hispanic immigrant group with four Hispanic groups based on national origin. The cross-elasticities of demand between the four Hispanic groups and the other male labor force groups are presented in Table 6.

Several interesting findings are provided by these selected results. First, Mexicans—who make up nearly 60 percent of the male Hispanic population—have had a negative impact on the earnings of both white and black native-born men. This impact, however, is small: a 10 percent increase in the number of Mexicans reduces the earnings of white native-born men by .03 percent and the earnings of black native-born men by .07 percent. Second, Puerto Ricans are substitutable inputs only with black immigrants; there is a complementary or independent relationship between Puerto Ricans and all other native-born male groups. Third, Cubans have not had an adverse impact on the earnings of any of the native-born male groups. In fact, a significant complementary relationship exists between Cuban men and white, black, and

Table 7. Elasticities of Factor Prices Within Hispanic Groups (1980 Census).

With Respect to the Quantity of:	*The Change in the Wage of:*			
	MX	*PR*	*CU*	*OS*
MX	−1.275*	.0078*	.003*	.001
	(−2.43)	(5.65)	(2.48)	(.70)
PR	.031*	−1.020	.000	−.013*
	(5.65)	(−1.76)	(.04)	(−3.00)
CU	.016*	.000	.482	−.004
	(2.48)	(.04)	(1.03)	(−.49)
OS	.003	−.015*	−.002	−.828
	(.70)	(−3.00)	(−.49)	(−1.89)

Note: For an explanation of abbreviations, see the text.

The t-ratios in parentheses refer to the technological parameter γ_{ij} for the cross-elasticities, and to $(\gamma_{ii} - r_i)$ for own-elasticities.

*Significant at the 5 percent level.

Asian native-born men. Interestingly, Cubans are substitutable only with one of the immigrant groups—Asian immigrants. It is of interest to note that Asian immigrants, like Cubans, tend to have above-average success in the labor market.

Despite the statistical significance of these cross effects, their numerical magnitude is small. On the other hand, Table 7 shows that the numerical impact of increases in the supply of the different types of Hispanics on their own wage is much larger. The own price elasticity of demand for the various Hispanic groups ranges around unity (in absolute value) for three of the groups, and is perversely positive but insignificant for the fourth (Cubans). Thus a 10 percent increase in the supply of Mexicans, Puerto Ricans, or other Hispanics will lead to about a 10 percent decrease in the wage of the own group.

Summary

This study of the extent of labor market competition among immigrants, minorities, and the native-born population has found that, in general, immigrants tend to be substitutes for some labor market groups and complements for others. White native-born men tend to be adversely affected by the increase in immigrant supply, whereas black native-born men have, if anything, gained slightly from increases in the immigrant supply. All these cross-effects of shifts in immigrant supply on the earnings of native-born men are numerically very small.

On the other hand, increases in the supply of immigrants do have a sizable impact on the earnings of immigrants themselves. An increase of 10 percent in the supply of immigrants reduces the immigrant wage by about 10 percent. Thus, immigrants' main competitors in the labor market are other immigrants.

These results withstand changes in the estimation procedure and disaggregations of Hispanics into national origin groups. Increases in the supply of the various Hispanic groups—Mexicans, Puerto Ricans, Cubans, and other Hispanics—have small effects on the earnings of non-Hispanics, but sizable effects on the earnings of the groups themselves.

Despite these varied results, the empirical study of the impact immigrants have had on the U.S. labor market is still in its infancy. Difficult substantive and technical problems remain to be resolved. Perhaps the most important issue is the modeling of the labor supply decisions of immigrants and native workers. In particular, it is well known that a large fraction of immigrants reside in a relatively small number of labor

markets. The factors motivating these internal migration decisions among the foreign-born population need to be specified explicitly in the wage determination process. In addition, since the geographic concentration of immigrants in a small number of labor markets is likely to exaggerate their impact within those labor markets, the native population may respond by initiating its own set of migration flows. If such speculations are correct, it is likely that future research will lead to an increased understanding of the wage determination process for both native- and foreign-born persons.

One finding of this study, tentative though it must be, bears emphasis: namely, the common assumption that immigrants have large effects on native earnings is *not* confirmed by Census data. Even a detailed disaggregation of the immigrant population by racial and ethnic background and of the Hispanic population by national origin fails to reveal a single instance in which cross-effects are large.

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