

New Evidence on Immigration and Labor Market Outcomes Using Linked Longitudinal Employer-Employee Data*

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Abstract

A complete analysis of two important aspects of immigration – where immigrants are employed and their resultant effect on other workers in the same workplace – requires longitudinal linked employer-employee data. This paper provides the first analysis of these issues by using a newly developed data set connecting virtually the entire universe of workers linked to their employers in seven states during the 1990s. This rich new dataset allows us to document the types of workplaces that hire immigrant workers – size, growth rate, industry, as well as the characteristics of other workers at the firm. We then estimate firm- and metro-level wage effects for native workers in response to inflows of foreign born workers, while simultaneously controlling for observable worker characteristics, and both unobserved worker and firm heterogeneity. Our results provide important new evidence on the effects of immigrant labor market competition at various levels of aggregation.

1 Introduction

Since the mid-1960s immigrant flows have increased steadily, recently reaching the level of 1 million admitted annually, the highest in U.S. history. These large immigrant inflows combined with a relatively low native birth rate have resulted in a corresponding increase in the proportion of the population that is foreign born, from 4.7 percent in 1970 to 10.4 percent in 2000 (Lollock 2001). Given the magnitude of the flows and their resulting cumulative effect on the composition of the U.S. labor market, it would be surprising if immigrants did not affect native worker's earnings and mobility. However, despite what would appear to be a substantial shock to the U.S. labor market, previous research has been unable to consistently document large effects on native wages.¹ At the regional level, at least, this could in part be due to natives moving away from areas that experience large immigrant inflows. However, here as well, no clear consensus has emerged.²

Primarily due to limitations in the available data, previous research has provided little insight on the interactions of immigrants and natives within large metropolitan areas (SMSA's), due primarily to limitations in the available data. Thus, it is unknown how much of the native response to immigrant inflows may actually occur at the firm level. In addition, even if immigrants and natives cluster in the same SMSA's and industries, they may nevertheless sort into very different kinds of firms. If these firms differ meaningfully with respect to their characteristics (e.g., size, production technology, unionization, human resource policies, etc.), then we might expect these differences to help explain observed wage differentials between native and foreign born workers.³ In short, a failure to account for differences between the firms in which immigrants and native workers are employed may confound efforts to identify the effect of immigration on native wages.

The goal of this paper is to develop new estimates of the impact of immigration on the wages of native-born workers, while at the same time provide additional detail on the firm level interactions of immigrant and native workers. To do so, we use a linked employer-employee data set developed by the U.S. Census Bureau's LEHD Program and derived from

¹Lalonde and Topel (1991), Altonji and Card (1991), Enchautegui (1994), Card (2001), and Orrenius and Zavodny (2003) find mostly small effects of immigration on native wages. Borjas, Freeman, and Katz (1996), and Borjas (2003) find larger negative effects.

²Card and DiNardo (2000) find no evidence of selective out-migration by natives. Borjas (2003) finds stronger confirmatory evidence.

³Abowd, Kramarz, and Margolis (1999), among others, note the significant role played by firms in wage determination.

the universe of unemployment insurance quarterly wage records from seven states during the 1990s. All told, our analysis sample is comprised of 67 million workers, of which roughly 20 percent are identified as foreign born via a direct link to Census Bureau administrative records.

We begin our analysis by examining the extent of segregation of native and foreign born at the workplace. Next, we study how native workers respond to immigrant inflows at the firm level. Finally, we revisit the standard “area approach” analysis used by researchers in the past, extending it along two particular dimensions. First, we supplement the conventional approach of estimating the impact of immigration at the SMSA level with a measure of the concentration of immigrants within firms. Second, we investigate the importance of controlling not only for individual specific heterogeneity—something which studies relying on Decennial Censuses have been unable to do—but also for firm specific heterogeneity. In this respect, our work can be viewed as direct extension of recent research on the relative contributions of person and firm specific factors to wages.⁴

At this point, we should also acknowledge several disadvantages of the LEHD data. First and foremost, LEHD data only contains information on those actively participating in the labor markets of our seven sample states. As such, when workers leave our sample, it is impossible to determine whether they exited the labor force or simply moved outside our sample. Although immigrant competition may very likely influence both of these behaviors, our data do not permit a consideration of them. Second, we are only able to exploit a relatively short time series. Indeed, while we have observations throughout all of the 1990s, all seven states only appear together in four of these years (1995-1998). Finally, LEHD data contain only very limited demographic detail, a fact which complicates efforts to assign workers to well defined skill or occupation groups.

To preview our results, we find clustering at the firm level by immigrants and native workers to be a pervasive phenomenon. The average native worker is employed in a firm that is 13 percent foreign born while the average immigrant is employed in a firm that is 43 percent foreign born. Nontrivial proportions of firms are comprised exclusively of either foreign born or native workers. In addition, while foreign born workers comprise a relatively large proportion of the total workforce in industries like agriculture and manufacturing, these industries are also the most segregated.

⁴See Abowd and Kramarz (1999) for a discussion of the analysis of labor markets using employer-employee data. For a listing of recent working papers using LEHD data go to: <http://www.lehd-test.net/papers/index.php>.

Of course, most firms contain a mix of foreign born and native workers. However, we find clear evidence that native workers are more likely to leave firms that experience large inflows of foreign born workers than firms that experienced small inflows. To a lesser extent, the same tendency is apparent with respect to the probability of changing industries, but not with the probability of changing SMSA's. Natives leaving firms with large immigrant inflows also tend to move to firms with a lower proportion of foreign born workers.

Finally, our regression results suggest that the SMSA-level concentration of immigrants is positively associated with native earnings, although the magnitude of this association decreases with additional controls for worker and firm characteristics. On the contrary, at the firm level, we observe a negative relationship between immigrant penetration and workers' wages. While the positive SMSA level result may proxy for unobservable demand factors correlated with higher wages and larger immigrant inflows, the negative effect of immigration at the firm level is suggestive of a role for local labor markets in determining wages.

Upon further analysis, however, we find that the negative impact of firm level immigrant concentration appears to be driven by two factors. First, firms which employ large amounts of foreign born workers tend to be "bad firms," in the sense that they pay all their workers less, irrespective of their individual characteristics. Second, natives working in firms with large shares of foreign born workers tend to be less skilled, particularly with respect to their unobserved characteristics. Indeed, once we have controlled for observable and unobservable heterogeneity, the impact of firm-level immigrant penetration on wages is negligible.

2 Background and Motivation

The majority of empirical studies have attempted to capture the effects of immigration on wages using an area or regional approach. In its simplest form, the method compares the effects of immigration on native wages by estimating individual-level wage regressions for native-born workers and introducing a variable that controls for immigration as a percentage of the total labor force. Variation in the concentration of immigrants is typically achieved by defining local labor markets as a Standard Metropolitan Statistical Area. Studies that have used this or a similar approach include Grossman (1982), LaLonde and Topel (1991), and Enchautegui (1994). In virtually all cases, a small or insignificant relationship is found between

increased immigration and labor market outcomes.⁵ However, one problem that may arise with this approach is the possible correlation between the concentration of immigrants and omitted regional factors that influence wages. Since it is expected that immigrants will be attracted to those areas that offer the greatest rewards and lowest costs to migration, we would expect the estimates of the effect of immigration to be biased upward (e.g., appearing as small positive effects when they are, in fact, negative).⁶

LaLonde and Topel (1991) use a first-differenced approach to address this problem by creating a pseudo-panel from Census data but find no significant difference between their panel and cross-sectional results. Their results suggest that the burden of immigration tends to fall on immigrants themselves with both the own and cross effects diminishing as years since entry increases. Altonji and Card (1991) attempt to systematically correct for possible correlations between immigrant shares and both fixed and variable region-specific effects by using an instrumental variable procedure in conjunction with first-differenced regressions. The fraction of immigrants in 1970 is used to predict the change in the fraction of immigrants over the following decade. They conclude that a 10-percentage-point increase in the concentration of immigrants reduces the wages of low-skilled natives by, at most, 1.2 percent while simultaneously finding an ambiguous impact on employment.

An additional problem concerns the exclusion of controls for the internal migration of native-born workers. Borjas (2003) examines immigration's effect on specific skill groups and finds that immigrants depress the earnings of lowest- and highest-skilled workers. In place of occupation groups, Borjas constructs 32 education/experience categories. Using national level variation in these skill groups over several decades, Borjas estimates that immigration between 1980 and 1990 was responsible for reducing wages by as much as 8.9 percent for high school dropouts. Although smaller in magnitude, college graduates and high school graduates also experienced earnings decreases of 4.9 and 2.6 respectively, while the wages of those with some college showed little effect..

More recently, research has focused on better identifying the true extent of immigrant competition at the SMSA level. Measures of the proportion of immigrants in an SMSA may not accurately capture the extent of immi-

⁵The one exception is Grossman (1982) who, using 1970 Census data, finds significant negative effects associated with immigration.

⁶Card's (1990) well known study on the "Mariel boatlift," examines the closest approximation to an exogenous increase in the supply of immigrants to a particular market but found no significant effect on wages or unemployment levels of low-skilled workers.

grant labor market competition for most workers, since immigrants are not equally distributed across various jobs in these local labor markets. Card (2001) examines the impact of recent immigrants on occupation-specific labor markets, while also incorporating measures of internal migration. After obtaining SMSA and occupation-specific immigration and migration measurements, and estimating wage regressions for native men and women, the estimated effects of immigration remains small. The largest effects suggest that a 10 percent increase in the immigrant population share reduces wages by 0.5 percentage point.

Orrenius and Zavodny (2003) also use occupation to define separate labor market groups within SMSA's. Using Immigration and Naturalization Service (INS) and Current Population Survey (CPS) data, along with an instrumental variables technique in a panel model that controls for both SMSA and year effects, they obtain results that are consistent with Card (2001). A 10 percent increase in the share of immigrants is associated with a 0.3 percent reduction in wages for low-skilled natives. The wages of medium- and high-skilled workers, on the other hand, are positively associated with increases in immigrant concentration.

As mentioned above, the LEHD data unfortunately do not contain occupation or education measures. As such, we are unable to identify occupation- or skill group specific labor markets within SMSA's. Instead, we implement an alternative approach towards gauging the intensity of immigrant competition. Namely, we study the wage effects of immigrant inflows at the firm level in addition to the usual SMSA level inflows. Of course, large firm level inflows may cause certain workers to move to another firm (or SMSA) with relatively fewer immigrants, resulting in a select group of workers who remain. Fortunately, our data permit us to follow such workers over time so long as they move across firms and regions in the seven states for which we have data. Furthermore, the ability to simultaneously control for person and firm specific factors should reduce the potentially confounding effects of unobserved region specific factors. Indeed, conditional on observable individual characteristics, fixed region specific factors can be viewed simply as a weighted sum of all the person and firm effects in each region.⁷ Of course, to the extent regional factors change differentially during the period under consideration, they will not be fully absorbed by the firm and year effects in our model.⁸

⁷See Abowd, Kramarz, and Margolis (1999) for a formal discussion of such aggregation in the context of industry and firm size wage premia.

⁸In future work, it should be possible to introduce time varying firm effects to further reduce the effects of such factors.

3 Estimating Native Wage Effects

As discussed in the preceding section, numerous attempts have been made by researchers to mitigate the omitted variable bias present in these estimates. These refinements have primarily focused on native migratory patterns that are likely to affect wages and also exhibit a significant correlation with immigrant concentrations. The primary objective of this study is to address another potential source of omitted variable bias resulting from the exclusion of unobservable firm and/or individual characteristics.

Before continuing further it is important to more precisely define the primary variable of interest for both our wage and mobility analysis. The impact of immigration will be estimated by including the proportion of immigrants p at the level of the SMSA, $s = 1, \dots, S$ and firm, $j = 1, \dots, J$.

$$p_{st} = \sum_{(i) \in \{S(J(i,t))=s|t\}} \frac{1(M(i) = 1)}{1(M(i) = 1) + 1(M(i) = 0)} \quad (1)$$

$$p_{jt} = \sum_{(i) \in \{J(i,t)=j|t\}} \frac{1(M(i) = 1)}{1(M(i) = 1) + 1(M(i) = 0)} \quad (2)$$

These measures are calculated by summing over all workers present in an SMSA and firm, respectively in period t where $M(i) = 1$ when an individual is foreign born and $M(i) = 0$ otherwise.⁹ The function $S(J(i, t))$ maps firms to their associated SMSA and the function $J(i, t)$ assigns each worker i at time period t to the correct place of employment j . The function $1(A)$ equals 1 when the condition is true and 0 when the condition is false.

Our empirical strategy builds on the basic human capital earnings model shown in equation 3,

$$y_{it} = x_{it}\beta_{M(i)} + \varepsilon_{it} \quad (3)$$

in which y_{it} is the log real annualized earnings of individual $i = 1, \dots, N$ at time period $t = 1, \dots, T$ and x_{it} contains at most the following columns: year dummies, SIC industry division dummies, labor force attachment dummies (discussed below), a quartic in experience, years of education, and a white/non-white dummy all interacted with foreign born status $M(i)$.

⁹Our measure of the percent foreign born differs from previous research in that p_{st} represents the percent of the *working* population that is foreign born, while previous research has typically used the percent foreign born in the total population. We have yet to conduct a detailed analysis of the differences between the two measures at the SMSA level.

We begin our exploration by estimating various permutations of the model in equation 4 with a primary focus on the coefficients ω and η . We consider immigration’s effect not only on natives but also on the foreign born themselves.¹⁰

$$y_{it} = x_{it}\beta_{M(i)} + p_{S(J(i,t))t}\omega_{M(i)} + p_{jt}\eta_{M(i)} + \varepsilon_{it} \quad (4)$$

Previous research suggests that we should expect to find small negative or even positive effects at the SMSA level. However, the expected sign of $\eta_{M(i)}$ is less clear (and we have no prior baseline). On the one hand, if wages are set at the SMSA or national level, then labor supply shocks at the firm level may not exert any effect on wages. Accordingly, a nonnegative value for $\eta_{M(i)}$ might simply reflect the correlation of p_{jt} with individual characteristics unobserved by the econometrician but nevertheless valued by the labor market. On the other hand, if highly localized labor markets do play a role in influencing wages then wages might truly fall in response to large inflows of immigrants at firms. Alternatively, if, for whatever reason, firm characteristics do influence wages, then a nonnegative value for $\eta_{M(i)}$ may reflect the correlation of such characteristics with the percentage foreign born at the firm. For example, if firms that employ a large number of foreign born workers are “bad firms” in the sense that they tend to pay all of their workers less conditional of their personal characteristics, then we might expect $\eta_{M(i)}$ to be biased downwards.

Although workers are mobile and may move from firm to firm in undesirable ways (at least from the researcher’s viewpoint), our ability to observe workers over time allows us to control for the types of workers present at firms with a large foreign born workforce. Since we also observe firms over time we can simultaneously control for the types of firms that employ large numbers of immigrants. Do these firms pay relatively lower wages and if so does the firm’s wage policy change as the firm hires additional immigrants?

Our attempt to address these issues is represented by equation 5, where we add controls for unobserved person and firm heterogeneity represented by the fixed person and firm effects θ and ψ .

$$y_{it} = x_{it}\beta_{M(i)} + p_{S(J(i,t))t}\omega_{M(i)} + p_{jt}\eta_{M(i)} + \theta_i + \psi_{J(i,t)} + \varepsilon_{it} \quad (5)$$

The variation in wages that we exploit in equation 5 is now different than what was used in equation 4. Rather than examine how wages vary *across*

¹⁰The neglect of the own effect in previous research seems unwarranted given that a recent immigrant’s closest competitor in the labor market is likely to be another recent immigrant.

SMSA's and firms we are now comparing individual firm specific earnings growth for workers at firms that have had large changes in the percent foreign born versus those that were moderately affected. The negative effect of immigration on native wages will be larger if individual firm specific wage growth is lower in SMSA's and firms that have experienced large changes in the percent foreign born.

The ability to estimate an effect for native workers using this model depends crucially on the mixing of workers at the firm level. For example imagine a segregated labor market where there are two types of firms, all native and all foreign born, and workers never move from one type of firm to another. In this case we would not be able to estimate an effect. Of course this example is unrealistic, but it does highlight the fact that there must be some mixing of immigrants and natives at the firm level.

The use of controls for unobservable person and firm heterogeneity combined with firm level data allow us to tell a much richer story of the effect of changes in immigrant penetration on both native and foreign born wages. For example, does an increasing fraction of immigrants at the firm reduce earnings growth for persons *at that firm*? Of course if there are significant negative wage effects, some workers are likely to leave and move to firms with relatively few immigrants (or none at all). Given that switching firms is costly, persons with the highest external wage would be most likely to leave, resulting in a select group of workers remaining at the firm. An estimate of the magnitude of this type of selective migration can be inferred by examining the changes in ω and η when we include θ in our model.

4 Construction of the Data

4.1 Individual Records and Employment Histories

We use the LEHD Program's individual, employer, and employment history databases which are described briefly below.¹¹ As mentioned, the individual data were derived from the universe of unemployment insurance (UI) quarterly wage records from seven states. Individuals are uniquely identified and followed for all quarters in which their employers had reporting requirements in the UI system.¹² Thus, cross-state mobility can be observed for

¹¹See Abowd, Lane, and Prevoost (2000) and LEHD Program 2002 for more detailed discussions. Portions of the text in this section are derived from the summary in Abowd, Lengermann, and McKinney (2003).

¹²The BLS Handbook of Methods (U.S. Department of Labor 1997) describes UI coverage as "broad and basically comparable from state to state," and claims "over 96 percent

individuals moving between any of the seven states for which we have data. Although coverage dates vary, all states provide between five and ten years of data throughout the 1990s. Table 1 details the coverage dates and number of individuals appearing in each of these states. When the information from all seven states is combined we have data for approximately 67 million workers, accounting for about 45 percent of the U.S. workforce.

The UI wage records connect individuals to every employer from which they received wages in any quarter of a given calendar year, allowing us to construct individual employment histories. Employers are identified by their state unemployment insurance account number (SEIN). While large employers undoubtedly operate in multiple states, their SEIN's are state specific, meaning they cannot be connected. In addition, while we match workers to their employers, it is not possible to connect those employed in firms with multiple establishments to specific places of work. The severity of this limitation varies by state with between 50 and 70 percent of employment occurring in firms with only a single UI wage record establishment.¹³ Table 1 shows the number of firms, as defined by SEIN's, that appear in each of the seven states. In total, we identify over 3.6 million SEIN's.

4.2 Converting Earnings to “Annualized” Wages

For every year that an individual appears in the data, we identify a “dominant” employer—the employer for whom the sum of quarterly earnings is the highest.¹⁴ In order to better approximate the individual's full-year annual wage rate and thus reduce the importance of within-year labor supply decisions, we transform the earnings from the dominant employer according to

of total wage and salary civilian jobs” were covered in 1994. UI wage records measure “gross wages and salaries, bonuses, stock options, tips, and other gratuities, and the value of meals and lodging, where supplied.” They do not include OASDI, health insurance, workers compensation, unemployment insurance, and private pension and welfare funds. The Federal Unemployment Tax Act (FUTA) mandates coverage of all employers with one or more employees in a calendar year, although it allows for several exceptions (Stevens 2000), among them workers at small agricultural co-operatives, employees of the Federal government, and certain employees of state governments, most notably elected officials, members of the judiciary, and emergency workers.

¹³Prior to any of the work discussed above, job history, earnings, and name information are used to correct miscoded person identifiers (Abowd and Vilhuber 2003). All person identifiers are subsequently anonymized. Attempts are also made to correct for administrative changes in the SEINs by studying large cross “firm” movements of workers (McKinney 2002).

¹⁴A person may have multiple employers both within and across state borders during the year. In all cases, the “dominant” employer rule applies.

the following procedure. First, define full quarter employment in quarter t as having an employment history with positive earnings for quarters $t - 1$, t , and $t + 1$. Continuous employment during quarter t means having an employment history with positive earnings for either $t - 1$ and t or t and $t + 1$. Employment spells that are neither full quarter nor continuous are designated discontinuous.

If the individual was full quarter employed for at least one quarter at the dominant employer, the annualized wage is computed as 4 times average full quarter earnings at that employer (total full quarter earnings divided by the number of full quarters worked). This accounts for 84 percent of the person-year-state observations in our eventual analysis sample. For the other two cases, continuous (11%) and discontinuous (5%), it is extremely unlikely the individual worked at the firm the entire quarter. In the continuous case the individual either entered into or left employment with the firm during the quarter, while in the discontinuous case the individual both entered and left employment. Rather than make a naive assumption for these cases, we estimated the expected employment duration using available summary information.¹⁵

At this point, we have adjusted each individual's earnings to their full year equivalent, our best estimate of what the individual would have earned at the firm had they worked the entire year. However, an individual's labor supply depends on both the duration and the average number of hours worked, thus we would prefer to include only full-time workers in our sample. Because our data do not contain direct information on full-time status, we use the CPS to develop an imputation model using a set of variables similar to those available on the UI: earnings, age, number of quarters worked and industry. Applying this model to the UI data results in slightly over 80 percent of dominant employer person-year observations imputed to be full-time.

4.3 Identifying Foreign Born Workers

Using the Census Bureau's Numident/Personal Characteristics File (PCF), which contains information gathered when individuals apply for a Social

¹⁵Specifically, we estimate the inverse of the employment duration for both cases by taking the ratio of state level average full quarter earnings to either average continuous quarter earnings or average discontinuous quarter earnings. The population weighted average of the estimated ratios in each state for the continuous and discontinuous cases are 2.55 and 2.69 respectively. This implies an expected employment duration of 0.39 for the continuous case and 0.37 for the discontinuous case, significantly closer together than one might expect a priori.

Security Number (SSN), demographic characteristics are attached to the individual earnings data. This information includes sex, race, date of birth, place of birth, and date of first contact with the Social Security Administration (SSA). An individual is defined as foreign born if their place of birth is available and the location is outside the United States and its territories. The data on place of birth is available over 99 percent of the time when a record contains an SSN among the set of SSN's ever issued by SSA. However, some records contain an SSN that has yet to be activated by SSA. For these individuals, no demographic information is available except for sex and education, which are assigned based on a statistical linking procedure.

The place of birth and the validity of the SSN combine to create our three major classification groups (Native, Foreign Born, and Invalid SSN), shown by state in Table 1. The results are as one would expect, with the largest to the least foreign born populations found respectively in California, Texas, Florida, Illinois, Maryland, Minnesota, and North Carolina. Not surprisingly, the invalid SSN category appears to be relatively large in states that also have a large identified foreign born population (especially states with relatively large populations of workers that emigrate from Mexico), but is also large relative to the foreign born population in both Maryland and North Carolina.

Figure 1: Comparison of Census 2000 with UI data

	Total	Natives	Foreign Born
Census 2000	43,844,090	35,483,254	8,360,836
LEHD (valid SSN)	40,462,318	33,579,451	6,912,867
LEHD (valid and invalid)	41,223,581	33,579,451	7,644,130
Difference (row 2-1)	-0.080	-0.055	-0.19
Difference (row 3-1)	-0.062	-0.055	-0.09

This paper represents one of the first uses of the LEHD database for immigration related research. Therefore, it is useful to have an estimate of the coverage of the LEHD data relative to a more standard household based data source such as Census 2000, the results of which are shown in Figure 1. The Census 2000 row is calculated using only civilians employed at the beginning of April 2000, aged 16 years or older, working at a private firm or self-employed at an incorporated firm in one of the seven sample states.¹⁶

¹⁶The Census long form data is organized by place of residence, while the LEHD data are organized by place of work. In order to capture persons working outside their state of residence, we used Census data for all 50 states plus the District of Columbia. All respondents working in one of our seven sample states were retained

The LEHD data were restricted to include workers age 16 years or older with reported earnings for both the first and second quarter of the last available year of data for that state. Overall, the results suggest that UI coverage is very good, with only about 6 percent fewer workers found in the LEHD data than in Census 2000. Given the geographic location, earnings, and industry affiliation of the Invalid SSN group (discussed further below), it appears likely that a large proportion of workers in this group might be foreign born workers that entered the United States illegally. In column 2, we show the identified foreign born totals for the LEHD data, while in column 3 we assume all of the workers in the Invalid SSN category are foreign born. This results in a significant drop in the under-coverage for the foreign born and, at a minimum, allows us to establish bounds on the under-coverage (-0.06 to -0.19).¹⁷ Overall, the results suggest that the LEHD data is an excellent potential source of information on America’s foreign born workers.

4.4 Estimating Other Individual Characteristics: Education and Experience

Due to the importance of education in our subsequent analysis, further discussion of the education impute is warranted. Years of education are imputed separately for males and females based on an ordered logit model with 13 separate education categories. The regressors in this model are nine age groupings, vintiles of earnings, and ten industry categories. Census data from 1990 was used to develop the model and the actual impute is done using a workers earnings and industry for the closest available year to 1990. Throughout the paper, imputed education is used as a control variable in several of the regressions and also to create two broad skill categories: high (years of education greater than 12) and low (12 years of education or less).

The final topic we cover in this section is the calculation of a worker’s experience in the labor market. For natives, the calculation of experience is relatively straightforward. Upon their first appearance in the data, experience is set equal to (age – education – 6). In subsequent periods, experience is measured as the sum of observed experience and initial (potential) experience. For immigrants, the calculation of initial experience differs, recognizing the fact that in most cases they have spent only a portion of their career working in the U.S. Evidence from Chiswick (1978) and Borjas (2003) suggest that labor market experience accumulated outside the U.S. is valued at a lower level in the U.S. labor market. In recognition of this

¹⁷Given that most of the LEHD observations are for 1 or 2 years prior to the survey date of Census 2000, these results are likely even closer than shown in Figure 1.

evidence, in what follows we assume that labor market experience earned outside the U.S. labor market carries no value, and do not include it in our experience measure.¹⁸ Instead, initial experience for the foreign born is calculated as $\min(\text{years in the U.S.}, \text{age} - \text{education} - 6)$, where years in the U.S. is calculated as the (date of first appearance in the data - date of first contact with SSA).¹⁹ This measure also assumes that foreign born workers that attend at least some primary or secondary schooling in the U.S. accumulate initial experience at the same rate as natives.

4.5 Analysis Sample and Summary Statistics

As in Abowd, Lengermann, and McKinney (2003), we restrict our analysis sample to individuals aged 18-70, employed full-time at their dominant employer. Table 2 presents sample means for the period 1990-2000 broken out separately for native workers, foreign born workers, and those with invalid SSN's. We also contrast our analysis sample with the full (unrestricted) file. In total, the analysis sample contains 278 million person-year observations for the aforementioned 67 million individuals and 3.6 million firms. About 79 percent of workers are native born, 18 percent are foreign born, and 3 percent possess invalid SSN's.²⁰

In comparison to the full sample, native workers in the analysis file have considerably higher annualized wages as well as annual earnings. They are also slightly more educated, male, white, and experienced, and work in somewhat larger firms. Fifty percent of observations are from individuals who worked four full quarters during the year, while, only five percent are from discontinuous employment spells. Sixty-eight percent of natives in the sample were employed either in Services (36%), Manufacturing (17%), or Retail trade (15%). A mean annualized wage of \$40,118 (1999 dollars) reflects the average value of what native workers would have earned at their dominant employer had they worked full-time for the entire year.

¹⁸While the evidence in Borjas 2003 suggests that foreign labor market experience does have value, it is worth only about 25 percent of the value of an additional year spent working in the U.S., suggesting the need for further refinement of our approach.

¹⁹We have not yet assessed whether date of first contact with SSA is a good proxy for the entrance of a person into the U.S. labor market. However, given the benefits of obtaining a SSN, we would expect an immigrant to contact SSA and obtain one as soon as legally allowed. We plan to compare this measure with CPS self-reports in a future version of this paper.

²⁰While workers with invalid SSNs account for 3 percent of all workers, they account for only 1 percent of all observations.

Foreign born workers are less educated than their native counterparts and slightly more likely to be male. Only 25 percent of foreign born workers are white, compared to 75 percent of native workers. In addition, although the foreign born work in larger metropolitan areas than natives, the firms in which they work are slightly smaller. The average foreign born worker had an annualized wage of \$33,764 based off raw annual earnings of \$22,796. Roughly the same percentages of foreign born and native workers worked four full quarters or was discontinuously employed. Although a noticeably larger proportion of foreign born workers was employed in agriculture than natives, the three most common industries—Services (32%), Manufacturing (22%), and Retail Trade (15%)—were the same as for natives.

Discounting all potential experience gained by foreign born workers prior to entering the U.S. has a substantial impact on the estimate of labor market experience for foreign born workers. Table 2 shows that the adjusted experience measure is half the size of the measure generated based on the technique used for natives. As a result, even though the average native and foreign born worker are the same age, native workers possess an average of about 20 years of experience, compared with just 10 years for foreign born workers.

While summary statistics for many of the variables discussed above can be obtained using more traditional data sources, the LEHD data enable us to compute the proportion of each individual's coworkers that is foreign born. Table 2 shows the average native worker is employed in a firm which is 13 percent foreign born. In contrast, foreign born workers are employed in firms that are 43 percent foreign born. This result indicates a large amount of clustering by native and foreign born workers at the firm level, an issue which we will return to in greater detail below. Such clustering is also apparent, though to a lesser extent, at the SMSA level, as natives tend to work in regions with a slightly lower proportion of foreign born workers.

Finally, workers with invalid SSN's earn a good deal less than foreign born workers, and are much less strongly attached to the labor force. Indeed, almost 50 percent do not work a single full quarter, while 25 percent are discontinuously employed. Workers with invalid SSN's also tend to work in much smaller firms than either natives or foreign born workers. In addition, a very large proportion of these workers—some 21 percent—are employed in agriculture. As stated earlier, although one cannot tell for certain, it appears highly probable that a large proportion of these workers may have entered the U.S. illegally.

In all subsequent analysis, we choose not to further discuss workers with invalid SSN's. However, two points are worth noting. First, although their

results are not reported, such workers are included in the fixed firm and fixed person and firm effect regressions in Section 5.3, as the identification of these models benefit from their inclusion. Second, when computing measures of the percent foreign born at either the firm or SMSA level, we have chosen to lump workers with invalid SSN's together with other foreign born workers. In all other aspects of our analysis, however, workers with invalid SSN's are excluded.

5 Results

5.1 The Mixing of Natives and Immigrants at the Firm Level

As discussed above, a distinct advantage of the LEHD data is that it permits us to locate immigrant and native workers within specific firms. Table 3 presents the 1998 distribution of the percent foreign born measure at the firm level for the data set as a whole as well as by SMSA size class, industry (SIC division), and firm size class.²¹ As an alternative means of summarizing the mixing of immigrants and natives within firms, the final column in Table 3 presents a segregation index, used recently by Kremer and Maskin (1996) and Lengermann (2003) in the more general context of segregation by skill. The index ranges between 0 percent—all firms have the same mix of foreign and native born workers—and 100% (complete segregation), and is simply the ratio of the between firm variance of the percent foreign born in firms to the total variance. Equivalently, using the analysis sample in Table 2, the segregation index can be calculated as the R^2 from regressing a foreign born indicator for each individual on a series of firm dummies.

The column labeled “Overall Percent Foreign Born” describes the overall percentage of workers that are foreign born in each year, industry, SMSA size class, and firm size class. For instance, in 1998, 18 percent of the workers in our pooled data set were foreign born. If foreign born workers were distributed evenly across firms according to their proportion of the total workforce, we would expect to observe a segregation index close to zero. Similarly, even if immigrant workers clustered in particular industries (agriculture, for instance) they might, nevertheless, be fairly evenly distributed across the firms in these industries.

²¹ Although we focus on 1998—the last year for which we have observations from all 7 states—the results are virtually identical in other years. Large SMSAs contains 495,000+ workers, while medium and small SMSAs contain 100,000-495,000 and < 100,000 workers, respectively. Firm size categories were based on estimates from the U.S. Small Business Administration: Large (> 2,500), Medium (80 to 2,500), and Small (< 80).

Table 3, however, indicates a substantial degree of clustering within firms. Without imposing any restrictions on the firms in our analysis, some 53 percent of firms (not shown) do not contain any foreign born workers at all, whereas 14 percent are comprised solely of foreign born workers. To a large extent, these differences are driven by small firms. Some 97 percent of the 2.3 million firms in 1998 have less than 80 employees. Moreover, 65 percent of these firms employ fewer than 5 employees. On the one hand, this suggests that, as in other research using LEHD data, we should exclude these smallest of firms. On the other hand, small firms appear to be disproportionately segregated. Without imposing the firm size restriction, some 12 percent (not shown) of small firms are exclusively foreign born. With it, this percentage falls to 1.4 percent. While the subsequent discussion of Table 3 will focus on firms with five or more employees, the process of immigrant sorting into very small firms certainly merits further analysis.²²

Even after imposing the firm size restriction, immigrant clustering remains an important phenomenon. Some 30 percent of firms contain no foreign born workers, while 12 percent contain more than 50 percent foreign born workers. While 56 percent of medium sized firms have less than 15 percent foreign born workers, some 10 percent of medium sized firms have workforces that are 50 percent or more foreign born. Even among large firms, which are the least segregated, some 10 percent of employers have workforces that are at least 30 percent foreign born.²³

We know from previous research that immigrants tend to cluster in large metropolitan areas, a fact also confirmed in Table 2. Indeed, 21 percent of workers in the large SMSA's in our data set are foreign born. Interestingly, the segregation index indicates that foreign born workers and native workers are, on the whole, more integrated in large metropolitan areas. About 22 percent of firms in large SMSA's contain no foreign born workers compared to 36 and 49 percent in medium and small SMSA's, respectively. However, large SMSA's also contain a higher proportion of firms that are heavily populated with foreign born workers. Approximately 15 percent of firms in

²²About 20 percent of both natives and foreign born workers are employed in firms with less than 5 employees in 1998. Thus, imposing the firm size restriction does not appear to disproportionately impact either group. More generally, natives and foreign born workers appear fairly evenly distributed across firm size classes.

²³The observable characteristics of native workers in firms with a large proportion of foreign born workers are notably different from those in firms with a small proportion of foreign born workers. While experience levels are roughly comparable, natives in firms with a high percentage of foreign born workers are less educated and have average annualized wages that are 20 percent lower than natives in firms with a low percentage of foreign born workers.

large SMSA's have workforces that are more than 50 percent foreign born, compared to just 8 and 3 percent in medium and small SMSA's.

Table 3 also shows that, while there appears to be a nontrivial amount of firm level segregation in most major industry groups, the extent of this segregation does vary a good bit. For example, while foreign born workers comprise a relatively larger proportion of the total workforce in agriculture (44%) and manufacturing (24%), these industries are also the most segregated. About 33 percent of firms in agriculture and 20 percent in manufacturing have workforces that are more than 50 percent foreign born.²⁴ Such clustering is a discernible characteristic in most other industries as well, in particular wholesale trade, construction, and retail trade.

5.2 Immigrant Inflows and Native Outflows

Although previous research has examined the question of whether native workers leave regions hit by large inflows of immigrants, in this section we examine the extent to which this kind of reallocation occurs at the firm level. For example, even if the extent of native outflows at the metro level is small, this does not necessarily preclude a high degree of firm level reallocation. Our data permit us to directly examine this question, albeit over a relatively short time period. Specifically, we identify firms that experienced large increases in the proportion of their workforce that is foreign born between 1995 and 1998. We then follow workers—both native and foreign born—employed in these firms in 1995 and examine whether they appeared more likely to change firms, industry, or metropolitan areas, than workers that experienced smaller firm level increases in the percent foreign born.

At present, a shortcoming of our analysis is its focus on firms that existed both in 1995 and 1998. As such, we ignore all entering and exiting firms during this period.²⁵ Similarly, in following workers, we only focus on those employed in these firms in 1995 that subsequently appear in our data set in 1998. Individuals that drop out of the labor force or move to other states not covered by our pooled data set will be missed. Nevertheless, we believe our estimates should provide an interesting initial assessment of the extent of native reallocation in response to firm level immigrant inflows.

²⁴Workers with invalid SSNs typically comprise a very small proportion (less than 1 percent) of the overall workforces in most industries. The one exception, however, is agriculture. Roughly 12 percent of all workers in agriculture have invalid SSNs.

²⁵Using the same data set, ALM find that, both within and across industries, exiting firms tend to have a higher proportion of low skilled workers than both entering or continuing firms. Although more foreign born workers are likely more heavily concentrated in such low skill firms, at present our analysis does not account for this.

As in the previous section, we restrict our analysis to firms with five or more employees, this time in both 1995 and 1998. We designate a firm as having a “large” influx of foreign born workers, if the percent of its workforce that is foreign born rose by at least 10 percentage points. About 44 percent of firms experienced an increase in the percent foreign born, while 35 percent experienced a decrease, and 21 percent remained unchanged. Of those experiencing an increase in the share of their workforce that is foreign born, roughly 25 percent increased by 10 percentage points or more.²⁶ Of those workers that appear in both 1995 and 1998, 6 percent of natives and 11 percent of foreign born were hit by such “large” shocks.

Table 4 presents the results of this analysis, first for the sample as a whole, and then broken out by firm size class. Not surprisingly, for both foreign born and natives workers, those in firms hit by large immigrant inflows tend to work in smaller firms (but larger SMSA’s) than those hit by small shocks. The extent of clustering can also be observed in the table. For example, the average native workers hit by a large shock was employed in a firm that was 18 percent foreign born. In contrast, the average foreign born worker hit by a large shock worked in a firm that was 40 percent foreign born.

Above all else, Table 4 highlights the large amount of worker mobility, even during the relatively short 3 year period under consideration. A significant portion of this mobility does appear influenced by whether or not workers initially worked in firms that experienced a large increase in the proportion of workers that are foreign born. While 36 percent of workers hit by a small shock changed firms, 58 percent of workers hit by a large shock switched firms. Although foreign born workers also appear more likely to leave firms hit by a large shock, the difference (45 versus 35 percent) is less pronounced. In addition, 51 percent of native workers hit by a large shock also switched 2-digit industry, compared with 32 percent of those hit by a small shock. Such differential responses are not evident for the percent of workers who changed SMSA’s, suggesting that a good deal of the native response to immigrant inflows may have been missed by previous research.²⁷

Where do workers hit by such shocks go? Native workers leaving firms that had a large immigrant shock tend to arrive at firms with a slightly

²⁶These shocks appear to be fairly symmetric. Roughly 25 percent of the firms in which the percent of foreign born workers declined experienced declines of 10 percentage points or more.

²⁷Natives in firms hit by large shocks have somewhat different demographic characteristics than those hit by small shocks. Specifically, they are slightly younger, and less educated, and as a result have roughly 10 percent lower annualized wages.

lower percentage of foreign born workers, both in an absolute sense as well as relative to native workers who left firms with a small influx. In contrast, irrespective of the size of the shock, foreign born workers who switched employers tended to move to firms with a slightly higher percentage of foreign born workers than the firm where they worked in 1995.

Of course, recall the amount of foreign born workers in firms hit by a large shock increased by at least 10 percentage points by 1998. This implies that the destination firm for workers who leave firms hit by large shocks may have a noticeably lower share of foreign born workers than the share their original firm has achieved by 1998. For example, while natives hit by a large shock on average move to firms with workforces that are only 1 percentage point less foreign born than their firm in 1995, the percent foreign born for their new employer in 1998 is at least 11 percentage points lower than their old employer once one accounts for the large shock that occurred between 1995 and 1998.

As before, the overall results mask somewhat different tendencies for workers employed in large, medium, and small firms. In large firms, 78 percent of native workers hit by a large shock changed firms. This is 50 percentage points higher than the percent of natives who change firms after being hit by a small shock. While immigrant workers hit by large shocks seem equally likely to change employers, they tend to move to firms with a higher percentage of foreign born workers than their 1995 employer. In contrast, the average native worker hit by a large shock moved to a firm in which the percent of foreign born workers is seven percentage points lower than the firm they left in 1995. Again, this is at least 17 percentage points lower than the percentage of foreign born workers their 1995 employer has obtained by 1998. Natives leaving large firms hit by a small immigrant shock, however, do not move to firms with as noticeably different a distribution of foreign born workers. To summarize all of these results, the difference between the response of native workers hit by large shocks and small shocks compared with the response of foreign born workers is approximately 14 percentage points.

Similar patterns were observed for workers in medium sized firms. In small firms, however, while native workers hit by a large shock were again more likely to change firms (55%) than natives hit by a small shock (45%), the difference is much less pronounced. The differential response for immigrants is even smaller. In addition, natives leaving small firms hit by a large shock do not appear to work in firms in 1998 with a lower percentage of foreign born workers than the firm they left in 1995.

5.3 Wage Effects of Immigrant Inflows

We begin by obtaining OLS estimates of various forms of equation 4, the results of which are shown in Tables 5A-C. In Table 5A we include only the percent foreign born at the SMSA, in Table 5B we include only the percent foreign born at the firm, and in Table 5C we include both measures.²⁸

The first column of table 5A-C, while not an important overall result, is nevertheless interesting due to the large initial differences between the firm and SMSA percent foreign born measures. In table A, the SMSA effects are positive for natives while negative or approximately zero for the foreign born. For example, in Table 5A column 1 a 10 percentage point increase in the percent foreign born is associated with a 5.98 percent increase in wages for native males. The picture looks different in table B where the results uniformly move in the negative direction except for foreign born males which were already strongly negative in table A. In the joint specification results, yet another picture emerges, the firm level results become even more negative, while the SMSA coefficients become more positive.

The results from our most basic specification highlight the important interaction between the percent foreign born at the firm and the percent foreign born at the SMSA. In general, as shown by the positive coefficients on the SMSA variables in Table 5C, the percent foreign born tends to be higher in areas that pay high wages, especially for natives. Also, not surprisingly both natives and the foreign born are more likely to work at a firm with a relatively high proportion foreign born when the SMSA also has a high proportion of foreign born workers. However, the typical foreign born worker appears to have a much stronger desire to cluster with other foreign born workers at the firm than natives both within and outside of high percent foreign born SMSA's as seen by the large changes in their SMSA level coefficients as we move from Table 5A to Table 5C. The location decisions of workers and the sorting this implies across SMSA's and firms is a consistent theme in our results and one we will return to again.

Continuing down the columns, the percent foreign born effects are relatively stable until we add controls for firm and SMSA size in column 4. At this point, the SMSA level coefficients move significantly in the negative

²⁸Each column in these tables represents a different specification, with additional control variables added as you move to the right. The reported coefficients are for a 100 percentage point change in the percent foreign born (SMSA or firm). A more plausible value would be a 10 percentage point change. When interpreting the results it is also useful to keep in mind that the variation in the percent foreign born at the firm level is much larger than at the SMSA. The standard deviation of the percent foreign born at the firm is 0.21, while the standard deviation of the percent foreign born at the SMSA is 0.11.

direction. This result highlights the fact that immigrants tend to locate in relatively large metropolitan areas where workers earn relatively high wages, implying that once again a large portion of the estimated foreign born effect at the SMSA appears to be the result of immigrant location choices.

In column 5 we add industry controls and then in the last column race and education are included in the model. In the final specification our estimates suggest that a 10 percentage-point increase in the SMSA level concentration of immigrants is associated with a 3.7 percent increase in annual earnings for native males, and a 5.4 percent increase for native females. These results are consistent with Bean, Lowell, and Taylor (1988), DeFreitas (1988), Enchautegui (1994), and others who find a positive relationship between native earnings and the local labor market supply of immigrants. For immigrants themselves, an increase in the fraction foreign born in an SMSA has a negative effect on earnings. A 10 percentage point increase results in a 3.6 percent reduction in annual earnings for foreign born males, and a 1.1 percent reduction for foreign born females. In general, these results are also consistent with LaLonde and Topel (1991), who find that the only significant negative wage effects of immigration are on immigrants themselves.

On the surface, our results in column 6 suggest that the immigrant penetration effect at the firm level does not appear to be significantly larger for a typical foreign born male worker than for the typical native male (-.375 vs. -.299). The SMSA level effects of immigration are generally positive for natives and outweigh the negative effects found at the firm level. However, for the foreign born the SMSA level effects are negative for males and positive, but half the size of natives, for females. An interesting question is: What is the total effect of the percent foreign born at the firm and SMSA for the typical worker in each group? Looking back at Table 2, we can see that the proportion foreign born at the SMSA for the typical native worker is about 17% while the proportion foreign born at the firm is only about 13%, a result that stands in striking contrast to the behavior of the foreign born. Not only do foreign born individuals work in SMSA's with a higher proportion of foreign born workers (24%) than natives, but the typical foreign born worker is employed at a firm where 43% of the workforce is foreign born.

The combination of the small SMSA effects for the foreign born and the high degree of clustering at the firm level results in an overall negative and very large effect for the foreign born. In contrast, natives who typically work in relatively low percent foreign born firms have a small overall positive

effect.²⁹ The total effect for each group, estimated at the means is 0.06 for native males, 0.09 for native females, -0.17 for foreign born males, and -0.11 for foreign born females.³⁰ These results imply that the typical foreign born male worker earns 23% less than the typical male worker solely due to the proportion foreign born in the area and firm where he is employed, an extremely large difference.

From here, we proceed to the estimation of various forms of equation 5, the results of which can be found in Table 6. In order to facilitate comparisons with our OLS results, the first column contains the coefficients from column 6 of Table 5C. In column 2 we include controls for unobservable non time varying person specific heterogeneity. In essence we are now looking at how changes in the percent foreign born affect changes in a worker’s earnings over time. By looking within person, we control for the fact that some persons earn high wages and some persons earn low wages for reasons unobservable to the researcher. This allows us to make useful comparisons across persons with vastly different earnings as long as a person’s wage growth tends to react in similar ways to a change in the percent foreign born.

Our fixed person effect results suggest that there are systematic differences between workers at firms and in SMSA’s where a high proportion of the workforce is foreign born. For natives the percent foreign born at the firm effect is now virtually zero and the positive SMSA effect has fallen precipitously. It appears that “high wage” workers are located in areas where a relatively high proportion of the workforce is foreign born, while at the same time successfully avoiding firms that exhibit this same characteristic. The negative firm level wage effects found in our OLS models appear to be primarily due to “low wage” workers clustering at high proportion foreign born firms.³¹

²⁹In light of the large wage penalty, one might expect foreign born workers to move out of high percentage foreign born firms unless they were unable or unwilling to do so. Perhaps foreign-born workers receive other benefits from clustering together in a firm (e.g., social interaction, networking for future employment opportunities, etc.). Another possibility is that some of these workers face substantial mobility barriers (e.g., lack of labor market knowledge, few opportunities outside of existing employment, poor language skills, etc.).

³⁰This effect is calculated relative to someone working in an area with no foreign born workers at the firm and the SMSA. Thus a typical native male would be expected to earn about 6 percent higher wages than a native male working in a completely segregated (all native) environment.

³¹By “low wage” and “high wage,” we refer to a worker that has relatively low and high earnings respectively, conditional on observable characteristics. The change in the coefficients suggest that “low wage” workers cluster at high percent foreign born firms,

The fixed firm effect results tell a similar story, there appear to be systematic differences in the types of firms located in high percent foreign born SMSA's and/or the types of firms that employ a large proportion of foreign born workers. Firms located in high percent foreign born SMSA's tend to pay high wages as can be seen by the movement left on the number line for the SMSA coefficients. However, once again most of the firms that have a high proportion foreign born appear to be "low wage" firms, or firms that paid low wages both before and after they increased their usage of foreign born workers, resulting in a movement to the right in the firm level coefficients. One interesting result occurs for native females, where although the magnitude and direction of the change is similar to native males, the relatively small estimated effect in the OLS regressions means that the percent foreign born at the firm results are now significantly positive (-0.107 vs .219).

In the final column of Table 6, we include both person and firm effects in the same model. Given the similar coefficients found in both the person and firm effect only models we would not expect our results to differ substantially and in general that expectation is correct. The magnitude of all the effects for natives are generally very small and close to zero. For example, the largest estimated effect for natives implies that a 10 percentage point increase in the percent foreign born at the SMSA would increase native male wages by 1.2 percent. Although the signs differ on some of the coefficients the overall results are similar for the foreign born.

In summary, using OLS we find positive effects for the percent foreign born at the SMSA level, a result that is consistent with previous research. Taking advantage of the LEHD database, we also show that persons, both native and foreign born, working in firms with a relatively high proportion of foreign born workers earns less than would otherwise be expected. However, once we look within person and/or firm these results disappear and the percent foreign born at both the firm and SMSA is found to have little effect on wages. Our results highlight the tremendous amount of sorting that is taking place in the labor market. Native workers tend to work with other natives and foreign born workers cluster with other foreign born workers. There also appears to be sorting taking place within natives and the foreign born across firms and SMSA's. "High wage" workers tend to live in high percent foreign born SMSA's, while at the same time avoiding high percent foreign born firms.

While our results are consistent with most area studies, they strongly

while "high wage" workers cluster in high SMSA areas only.

contrast with those reported by Borjas 2003. In an effort to bridge the gap between the large effects found by Borjas and the negligible effects found elsewhere in the literature, we introduce a skill component into our models. The introduction of skill can be conceptualized as a better estimate of the set of foreign born workers that compete directly with a given native or foreign born worker.³² For example immigrants from Mexico tend to have relatively little formal education compared with the typical immigrant from India, and therefore are likely to work in different locations and different types of jobs. For the set of native college graduates, increased Mexican immigration may have little effect on their earnings, but increased immigration from India may result in significant wage effects.

In Table 7 we present results for natives only using a two category measure of skill. A high skill worker is defined to have greater than 12 years of imputed education and a low skill worker 12 years or less. We also interact a worker's skill measure with the percent of high and low skill workers at the firm and SMSA, resulting in sixteen coefficients instead of the four found in our previous results. By interacting a worker's own skill with the percent foreign born at the firm/SMSA we are able to ascertain, for example, whether an increase in high skill immigrants has a different wage effect for high and low skill workers.

In column 1 we report the estimated wage effects using our new skill differentiated measure of the percent foreign born within a firm. Comparing these results with those reported in Table 5B column 6, the effects of including skill appear to be substantial. For example, a 10 percentage point increase in the proportion of low skill foreign born workers at the firm is estimated to reduce high skill native wages by 5.9 percent. In comparison, a 10 percentage point increase in the overall percent foreign born using the estimates from Table 5B, would be expected to reduce native male wages by 1.5 percent.³³ The signs of the coefficients generally appear sensible: an increase in the proportion of high skill workers appears to raise wages for both high and low skill workers, while an increase in the proportion of low skill workers appears to reduce wages for both groups.³⁴

³²This interpretation is consistent with Card 2001 and Orrenius and Zavodny 2003.

³³Once again it is important to keep in mind when interpreting the results that the variation across the different measures differs considerably. A 10 percentage point change in the proportion of immigrants at the firm that are low skill is a substantially larger change than is a 10 percentage point change in the overall percent foreign born. The standard deviations of the percent foreign born at the firm measures are; overall 0.215, high skill 0.104, and low skill 0.144. The standard deviations of the percent foreign born at an SMSA measures are; overall 0.109, high skill 0.047, and low skill 0.065.

³⁴The OLS results highlight another important difference with Borjas (2003), who finds

In column 2 we report results separately for the percent foreign born in an SMSA using a specification similar to the one used in table 5A. However, since the results in column 2 are very close to those reported in column 3 we do not discuss them further. Compared with the results of Table 5C, the overall magnitude of the effects in column 3 is larger, with the firm and SMSA coefficients generally having the same sign. The estimated effect of an increase in the percent high skill foreign born in an SMSA is particularly large for both natives and foreign born workers. A 4 percentage point change in the proportion high skill foreign born in an SMSA would be expected to increase native wages by about 10 percent compared with a similar change in the overall measure from Table 5C of 10 percentage points that would be expected to increase wages by about 6 percent.

Given the importance of controlling for person heterogeneity in our earlier estimates we run through a similar specification using the skill differentiated percent foreign born measures. These results are reported in column 4 of Table 7 and once again their inclusion has a large effect on our estimates. Overall the coefficients generally diminish in magnitude, however unlike the earlier results some large effects remain for low skill native males and females. For example, a 10 percentage point increase in the proportion of workers in an SMSA that are low skill is estimated to reduce the wages of low skill native male workers by about 8.5 percent. The result for foreign born females is similar, although puzzlingly the results for both high and low skill males are positive and relatively small in magnitude.

Overall the results of interacting a measure of skill with the percent foreign born appears worthy of further exploration. The size of the foreign born wage effects in the OLS regressions are significantly larger, although the inclusion of person heterogeneity controls dramatically reduces the coefficients for high and low skill native males. However, unlike our earlier results the coefficients for females remain large even with person effects included in the model.

6 Conclusion

Utilizing a new data source, we provide unique insights into the wage effect of large foreign born worker inflows. Unlike the typical cross-sectional survey used by previous researchers, the LEHD dataset is extremely dense and provides earnings and labor force participation for virtually all firms and workers in seven states during the 1990s. The longitudinal nature of

non-positive effects of immigration on all native skill groups

our data combined with consistent person and firm identifiers allow us to track the movement of workers from one place of employment to the next.

We exploit these features of our data by first highlighting the characteristics of the typical native and immigrant workplace. One characteristic of the workplace that is difficult to recover without linked employer-employee data is the mixing of natives and immigrants at the firm level. While substantial mixing does occur, we nevertheless find that both immigrants and natives tend to cluster together. For example, in 1998, 30 percent of firms with greater than five employees contain no foreign born workers, while 12 percent contain more than 50 percent foreign born.

The level of clustering differs depending on whether the cluster is defined at the firm or the SMSA level. For example, in 1998 approximately 18% of the workforce in our sample is foreign born. However, both native and foreign born workers appear to systematically sort themselves into different types of firms and SMSA's. The typical native works in an SMSA where 17% of the workforce is foreign born, although only 13% of the workforce at the native's place of employment is foreign born. For the foreign born themselves the differences are even larger, with the typical foreign born worker employed in an SMSA where 25% of the workforce is foreign born and the proportion foreign born at the firm is 43%.

Our wage regression coefficients are generally consistent with the results reported in other studies that exploit the differential penetration of immigrants across geographic areas. Our OLS results show a positive wage effect of increases in the percent foreign born at the SMSA level and a negative effect at the firm level. For example a 10 percent increase in the proportion foreign born at the firm would be expected to reduce native male wages by about 3 percent, while a similar increase in the percent foreign born at the SMSA would increase wages by 6 percent.

An important contribution of this paper is our ability to control for unobserved person and firm heterogeneity. The addition of these controls is shown to have a significant effect on the estimated effects reported in our OLS regressions, resulting in an overall negligible impact of immigrants on native wages. The large change in the coefficients from the OLS to the fixed effects specification highlights one of the primary themes throughout our paper, the systematic movement of workers from firm to firm. In this case it appears that "high wage" native workers move out of firms with large immigrant inflows and the remaining "low wage" native workers are responsible for the negative coefficients estimated in our OLS regressions.

In the spirit of Card 2001, Borjas 2003, and Orrenius and Zavodny 2003 we incorporate a crude measure of skill into our wage regressions. The

coefficients estimated using OLS are substantially larger than the effects reported above. However, after controlling for person specific unobserved heterogeneity our results for males fall dramatically, although unlike earlier efforts the effects for females remain sizeable

Although our methods may ultimately prove less successful in estimating the total native wage effect of increased immigrant inflows, we are able for the first time to explore the impact of immigrant inflows at the firm and SMSA level. Similar to the high levels of mobility across SMSA's documented by Borjas 2003, the high levels of sorting activity across firms *within* an SMSA is shown to have large impacts on our estimated effects

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Table 1: Composition of the Pooled LEHD Data Set

State	Dates	Persons	Firms	Annual Observations
Total	1990-2000	66,939,706	3,615,564	277,875,080
Native		0.792	--	0.811
Foreign Born		0.178	--	0.175
Invalid SSN		0.031	--	0.013
California	1992-1999	22,384,419	1,313,414	98,399,909
Native		0.679	--	0.696
Foreign Born		0.273	--	0.282
Invalid SSN		0.047	--	0.022
Florida	1993-1998	10,096,271	590,811	35,340,304
Native		0.802	--	0.814
Foreign Born		0.180	--	0.179
Invalid SSN		0.018	--	0.007
Illinois	1990-1998	9,136,857	445,661	44,695,200
Native		0.848	--	0.872
Foreign Born		0.125	--	0.118
Invalid SSN		0.027	--	0.010
Maryland	1986-1998	3,900,817	208,817	17,416,796
Native		0.875	--	0.902
Foreign Born		0.118	--	0.096
Invalid SSN		0.008	--	0.002
Minnesota	1996-2000	3,366,720	171,011	13,129,091
Native		0.908	--	0.936
Foreign Born		0.069	--	0.056
Invalid SSN		0.023	--	0.008
North Carolina	1991-2000	6,072,820	320,176	29,098,462
Native		0.915	--	0.947
Foreign Born		0.062	--	0.045
Invalid SSN		0.022	--	0.008
Texas	1995-1999	11,981,802	565,674	39,795,318
Native		0.827	--	0.847
Foreign Born		0.146	--	0.140
Invalid SSN		0.027	--	0.013

Notes: Individuals contribute at most one observation per year for each of the above states for which they worked. Data are restricted to fulltime workers, aged 18-70, at the firm for which they had the highest earnings across all states.
Sources: Author's calculations using the LEHD Program Employment Dynamics Estimates data base.

Table 2: Sample Construction & Means, LEHD Data 1990-2000

	Full Sample:			Analysis Sample: Foreign		
	Natives	Foreign Born	Invalid SSN	Natives	Born	Invalid SSN
N	427,487,654	87,757,973	8,968,203	225,462,466	48,675,049	3,737,565
<i>Earnings & Demographics:</i>						
Annualized Wage (\$1999)	27,958	25,085	14,621	40,118	33,764	21,527
Raw Earnings (\$1999)	16,432	14,238	4,301	27,900	22,796	7,392
Education	12.5	12.1	11.4	12.8	12.2	11.6
Male	51.5%	58.4%	50.5%	54.3%	60.2%	54.3%
Age	34.5	35.8	32.6	37.6	37.3	34.2
White	72.0%	23.3%	--	76.0%	25.6%	--
Experience	16.9	18.3	15.8	19.4	19.6	17.0
Adjusted Experience	--	9.3	15.6	--	10.4	16.8
SMSA Size	1,834,326	2,581,361	2,221,955	1,843,798	2,707,660	2,446,217
Percent Foreign Born, SMSA	16.5%	24.4%	22.7%	16.4%	24.6%	22.7%
Firm Size	2,955	2,628	838	3,446	3,007	874
Percent Foreign Born, Firm	13.4%	42.2%	46.5%	12.6%	42.7%	46.1%
Multiple Establishments	34.4%	28.5%	16.0%	35.6%	29.4%	15.3%
<i>Industry Affiliation:</i>						
Agriculture	2.1%	9.5%	26.2%	1.5%	6.9%	20.9%
Mining	0.4%	0.2%	0.1%	0.6%	0.3%	0.2%
Construction	6.0%	5.2%	7.9%	6.4%	5.2%	9.2%
Manufacturing	11.6%	16.5%	13.7%	16.6%	22.3%	19.3%
TCU	5.1%	3.5%	1.5%	6.6%	4.2%	1.8%
Wholesale Trade	5.0%	5.3%	4.2%	6.4%	6.7%	5.5%
Retail Trade	22.5%	18.7%	21.1%	15.2%	15.2%	19.2%
FIRE	5.5%	4.2%	1.2%	7.0%	5.0%	1.6%
Services	38.7%	35.6%	23.6%	35.5%	32.3%	21.5%
Public Administration	3.0%	1.3%	0.5%	4.4%	1.9%	0.8%
<i>Labor Force Attachment:</i>						
Fulltime	82.3%	86.3%	76.2%	100.0%	100.0%	100.0%
Discontinuously Employed	18.6%	18.9%	38.9%	4.9%	5.3%	25.2%
0 Full Quarters Worked	40.6%	40.7%	65.9%	15.2%	17.0%	47.5%
1 Full Quarter Worked	13.5%	13.7%	12.9%	12.3%	13.2%	15.7%
2 Full Quarters Worked	8.5%	8.6%	7.1%	11.1%	11.3%	10.8%
3 Full Quarters Worked	6.8%	7.1%	4.6%	10.3%	10.3%	7.8%
4 Full Quarters Worked	30.5%	30.0%	9.5%	51.1%	48.2%	18.1%

Notes: Earnings and labor force attachment data originate from unemployment insurance wage records from California, Florida, Illinois, Maryland, Minnesota, North Carolina, and Texas from 1990-2000. No single state contributed observations for all years. See Table 1. Demographic characteristics and industry affiliation were added through linkages with other Census Bureau and LEHD data bases. Education and fulltime status have been imputed using statistical matching procedures. Columns (4) - (6) restrict the sample to fulltime workers, aged 18-70, employed at their "dominant" employer in each year, i.e. the employer where an individual has the highest earnings.

Sources: Author's calculations using the LEHD Program Employment Dynamics Estimates data base.

Table 3: The Mixing of Natives and Foreign Born Workers Within Firms, LEHD Pooled Data 1998

	Firms	Overall % Foreign Born	<i>Distribution Foreign Born:</i>							Segregation Index
			0%	<15%	<30%	30-50%	50-70%	>70%	100%	
1998	804,891	18.2%	29.1%	31.9%	78.8%	8.9%	6.2%	4.4%	1.3%	27.8%
<i>Industry, 1998</i>										
Agriculture	30,735	44.3%	19.5%	15.3%	48.5%	16.3%	21.1%	12.2%	1.2%	35.5%
Mining	3,133	11.9%	41.3%	36.8%	91.7%	5.8%	1.9%	0.3%	0.0%	12.9%
Construction	80,594	16.8%	33.7%	29.9%	81.1%	9.6%	5.6%	2.7%	0.5%	28.4%
Manufacturing	79,025	24.3%	18.8%	26.8%	63.9%	14.0%	12.2%	8.0%	1.6%	33.1%
TCU	34,693	13.2%	31.7%	36.1%	83.5%	6.8%	4.4%	3.9%	1.2%	21.6%
Wholesale Trade	74,053	18.6%	31.3%	29.6%	77.4%	8.4%	6.3%	5.6%	1.8%	33.1%
Retail Trade	166,697	17.7%	29.0%	31.0%	77.5%	8.8%	5.9%	5.2%	2.1%	25.2%
FIRE	48,208	14.0%	33.4%	36.0%	87.5%	6.5%	3.1%	2.1%	0.5%	17.4%
Services	281,635	16.8%	29.7%	35.1%	84.0%	7.5%	4.3%	2.9%	0.9%	20.9%
Public Administration	6,118	8.8%	38.9%	55.3%	99.2%	0.6%	0.2%	0.0%	0.0%	8.3%
<i>SMSA Size Class, 1998</i>										
Large	533,065	20.7%	21.7%	30.8%	73.3%	10.9%	7.7%	5.8%	1.8%	25.6%
Medium	112,570	14.3%	35.5%	35.1%	85.2%	6.4%	5.1%	2.6%	0.3%	34.6%
Small	159,256	9.1%	49.0%	33.4%	92.4%	3.9%	2.2%	1.1%	0.2%	29.8%
<i>Firm Size Class, 1998</i>										
Large	1,360	15.9%	0.0%	60.7%	90.4%	7.9%	1.2%	0.5%	0.0%	10.8%
Medium	65,331	18.6%	1.2%	56.2%	79.0%	10.5%	7.4%	3.0%	0.0%	27.1%
Small	738,200	19.3%	31.6%	29.7%	78.7%	8.8%	6.1%	4.6%	1.4%	38.7%

Notes: Tabulations based on unemployment insurance wage records from California, Florida, Illinois, Maryland, Minnesota, North Carolina, and Texas for 1998. All states contributed observations for the period 1995-1998. Observations from firms with less than 5 employees are excluded. Overall percent foreign born refers to the percent of total workers that are foreign born (not including those with invalid SSNs). In the subsequent 7 columns, the unit of analysis is the firm. The percent foreign born in each firm was calculated and the above table presents the distribution across firms. A large SMSA contains 495,000+ workers, a medium SMSA contains 100,000-495,000 workers, and a small SMSA contains less than 100,000 workers. Firm size categories are as follows: Large (> 2,500), Medium (80 to 2,500), and Small (< 80). The segregation index ranges from 0% (all firms have the same mix of foreign and native born workers) and 100% (complete segregation). It was calculated using the analysis sample in Table 2 (one observation per person, firm, year) as the R2 from regressing a foreign born indicator on a series of firm dummies. This is equivalent to the ratio of the between firm variance of foreign born status to the total variance in the economy.

Table 4: Immigrant Inflows and Worker Outflows, LEHD Data 1995-1998

	<u>Native Workers:</u>		<u>Foreign Born Workers:</u>	
	Immigrant Inflow:		Immigrant Inflow:	
	Large	Small	Large	Small
Overall				
Person Count	664,983	11,844,451	230,681	2,173,335
Change Firm	58%	36%	45%	35%
Change SMSA	25%	21%	18%	17%
Change SIC	51%	32%	40%	32%
1995 Firm Size	365	5,233	598	5,005
1995 Percent Foreign Born, Firm	18%	12%	40%	34%
1995 SMSA Size	2,060,584	1,892,480	2,600,468	2,606,652
1995 Percent Foreign Born, SMSA	20%	17%	25%	24%
Movers: Change Percent Foreign Born, Firm	-1%	1%	3%	3%
Movers: Change Percent Foreign Born, SMSA	1%	1%	1%	1%
Firm Size--Large				
Person Count	16,674	3,998,204	9,430	644,412
Change Firm	78%	27%	73%	29%
Change SMSA	32%	18%	31%	18%
Change SIC	42%	24%	35%	26%
1995 Firm Size	9,146	14,358	11,105	15,676
1995 Percent Foreign Born, Firm	32%	12%	36%	22%
1995 SMSA Size	3,138,305	2,276,400	3,745,877	2,803,484
1995 Percent Foreign Born, SMSA	27%	19%	29%	25%
Movers: Change Percent Foreign Born, Firm	-7%	1%	3%	9%
Movers: Change Percent Foreign Born, SMSA	-1%	1%	-1%	1%
Firm Size--Medium				
Person Count	202,587	5,829,281	70,848	1,089,149
Change Firm	64%	39%	51%	37%
Change SMSA	32%	23%	24%	18%
Change SIC	56%	34%	46%	34%
1995 Firm Size	392	773	412	699
1995 Percent Foreign Born, Firm	21%	12%	37%	36%
1995 SMSA Size	1,941,756	1,706,258	2,500,662	2,507,785
1995 Percent Foreign Born, SMSA	18%	16%	23%	24%
Movers: Change Percent Foreign Born, Firm	-3%	1%	3%	2%
Movers: Change Percent Foreign Born, SMSA	1%	1%	1%	1%
Firm Size--Small				
Person Count	445,722	2,016,966	150,403	439,774
Change Firm	55%	45%	41%	37%
Change SMSA	21%	19%	14%	13%
Change SIC	49%	40%	38%	35%
1995 Firm Size	25	36	26	36
1995 Percent Foreign Born, Firm	17%	11%	42%	45%
1995 SMSA Size	2,074,277	1,669,646	2,575,667	2,563,085
1995 Percent Foreign Born, SMSA	21%	16%	26%	25%
Movers: Change Percent Foreign Born, Firm	1%	2%	3%	-1%
Movers: Change Percent Foreign Born, SMSA	1%	2%	1%	1%

Notes: "Large" firm level immigration shocks were identified as a 10 percentage point increase in the percent foreign born at a firm over the period 1995-1998. Increases less than 10 percentage points were labelled "small." Only firms who existed in both periods are used. Firm size was restricted to five or more employees in both periods. We identify all workers in our analysis sample employed at such firms in 1995, and, for those that appear 3 years later, examine their characteristics in 1998. Means in 1995 are for all workers who appeared in both 1995 and 1998 in firms that experienced an increase in the percent foreign born during this period. Means for movers are for a subset of these workers, namely those employed at a different firm in 1998. A large SMSA contains 495,000+ workers, a medium SMSA contains 100,000-495,000 workers, and a small SMSA contains less than 100,000 workers. Firm size categories are as follows: Large (> 2,500), Medium (80 to 2,500), and Small (< 80).

Sources: Author's calculations using the LEHD Program Employment Dynamics Estimates data base.

Table 5A: Least Squares Estimates of the Effect of Immigrant Inflows at the SMSA Level On the Log of Real Annualized Wages, LEHD Pooled Data 1990-2000

	N	(1)	(2)	(3)	(4)	(5)	(6)
<i>Native Males</i>							
Percent Foreign Born (SMSA)	122,000,000	0.598	0.646	0.603	-0.052	0.075	0.371
<i>Native Females</i>							
Percent Foreign Born (SMSA)	103,000,000	0.833	0.858	0.852	0.257	0.322	0.544
<i>Foreign Born Males</i>							
Percent Foreign Born (SMSA)	29,300,000	-0.518	-0.494	-0.501	-0.831	-0.575	-0.364
<i>Foreign Born Females</i>							
Percent Foreign Born (SMSA)	19,400,000	-0.085	-0.064	-0.075	-0.388	-0.259	-0.105
Additional Regressors:							
Time Dummies		No	Yes	Yes	Yes	Yes	Yes
Experience Quartic		No	No	Yes	Yes	Yes	Yes
Firm and SMSA Size		No	No	No	Yes	Yes	Yes
SIC Industry Division		No	No	No	No	Yes	Yes
Education and Race		No	No	No	No	No	Yes

Notes: The "pooled" data are comprised of annual observations from California, Florida, Illinois, Maryland, Minnesota, North Carolina, and Texas over the period 1990-2000. No single state contributed observations for all years. See Table 1. For each specification, separate regressions are run for native males and females, and foreign born males and females. T-statistics and standard errors are omitted as all variables are highly statistically significant at conventional levels.

Sources: Author's calculations using the LEHD Program Employment Dynamics Estimates data base.

Table 5B: Least Squares Estimates of the Effect of Immigrant Inflows at the Firm Level On the Log of Real Annualized Wages, LEHD Pooled Data 1990-2000

	N	(1)	(2)	(3)	(4)	(5)	(6)
<i>Native Males</i>							
Percent Foreign Born (Firm)	122,000,000	-0.124	-0.126	-0.099	-0.360	-0.326	-0.148
<i>Native Females</i>							
Percent Foreign Born (Firm)	103,000,000	0.187	0.179	0.204	-0.102	-0.056	0.068
<i>Foreign Born Males</i>							
Percent Foreign Born (Firm)	29,300,000	-0.602	-0.592	-0.505	-0.546	-0.451	-0.379
<i>Foreign Born Females</i>							
Percent Foreign Born (Firm)	19,400,000	-0.518	-0.517	-0.447	-0.461	-0.408	-0.367
Additional Regressors:							
Time Dummies		No	Yes	Yes	Yes	Yes	Yes
Experience Quartic		No	No	Yes	Yes	Yes	Yes
Firm and SMSA Size		No	No	No	Yes	Yes	Yes
SIC Industry Division		No	No	No	No	Yes	Yes
Education and Race		No	No	No	No	No	Yes

Notes: The "pooled" data are comprised of annual observations from California, Florida, Illinois, Maryland, Minnesota, North Carolina, and Texas over the period 1990-2000. No single state contributed observations for all years. See Table 1. For each specification, separate regressions are run for native males and females, and foreign born males and females. T-statistics and standard errors are omitted as all variables are highly statistically significant at conventional levels.

Sources: Author's calculations using the LEHD Program Employment Dynamics Estimates data base.

Table 5C: Least Squares Estimates of the Effect of Immigrant Inflows at the Firm and SMSA Level On the Log of Real Annualized Wages, LEHD Pooled Data 1990-2000

	N	(1)	(2)	(3)	(4)	(5)	(6)
<i>Native Males</i>							
Percent Foreign Born (Firm)	122,000,000	-0.466	-0.465	-0.411	-0.424	-0.425	-0.299
Percent Foreign Born (SMSA)		0.932	0.979	0.897	0.249	0.370	0.576
<i>Native Females</i>							
Percent Foreign Born (Firm)	103,000,000	-0.204	-0.203	-0.165	-0.214	-0.185	-0.107
Percent Foreign Born (SMSA)		0.976	1.000	0.968	0.401	0.446	0.614
<i>Foreign Born Males</i>							
Percent Foreign Born (Firm)	29,300,000	-0.621	-0.612	-0.511	-0.508	-0.429	-0.375
Percent Foreign Born (SMSA)		0.145	0.164	0.048	-0.284	-0.178	-0.027
<i>Foreign Born Females</i>							
Percent Foreign Born (Firm)	19,400,000	-0.593	-0.590	-0.508	-0.478	-0.427	-0.399
Percent Foreign Born (SMSA)		0.581	0.605	0.501	0.132	0.152	0.259
Additional Regressors:							
Time Dummies		No	Yes	Yes	Yes	Yes	Yes
Experience Quartic		No	No	Yes	Yes	Yes	Yes
Firm and SMSA Size		No	No	No	Yes	Yes	Yes
SIC Industry Division		No	No	No	No	Yes	Yes
Education and Race		No	No	No	No	No	Yes

Notes: The "pooled" data are comprised of annual observations from California, Florida, Illinois, Maryland, Minnesota, North Carolina, and Texas over the period 1990-2000. No single state contributed observations for all years. See Table 1. For each specification, separate regressions are run for native males and females, and foreign born males and females. T-statistics and standard errors are omitted as all variables are highly statistically significant at conventional levels.

Sources: Author's calculations using the LEHD Program Employment Dynamics Estimates data base.

Table 6: The Effect of Immigrant Inflows On the Log of Real Annualized Wages:
The Role of Person and Firm Heterogeneity, LEHD Pooled Data 1990-2000

	<i>Fixed Effect Models:</i>			
	OLS	Person	Firm	Person & Firm
<i>Native Males</i>				
Percent Foreign Born (Firm)	-0.299	-0.034	0.054	0.069
Percent Foreign Born (SMSA)	0.576	0.074	0.124	0.120
<i>Native Females</i>				
Percent Foreign Born (Firm)	-0.107	0.020	0.219	0.033
Percent Foreign Born (SMSA)	0.614	0.131	0.223	0.011
<i>Foreign Born Males</i>				
Percent Foreign Born (Firm)	-0.375	-0.137	-0.014	-0.038
Percent Foreign Born (SMSA)	-0.027	-0.181	-0.156	0.102
<i>Foreign Born Females</i>				
Percent Foreign Born (Firm)	-0.399	-0.086	0.029	-0.047
Percent Foreign Born (SMSA)	0.259	-0.006	-0.085	0.075

Notes: The "pooled" data are comprised of annual observations from California, Florida, Illinois, Maryland, Minnesota, North Carolina, and Texas over the period 1990-2000. No single state contributed observations for all years. See Table 1. Each model also includes time and SIC division dummies, a quartic in experience, and variables measuring education and race (OLS and firm effects only), firm size and SMSA size. All RHS variables are interacted with foreign born status in every regression. Although their results are not reported, workers with invalid SSN's are included in the fixed firm and fixed person and firm effect regressions, the identification of these models benefit from their inclusion. T-statistics and standard errors are omitted as all variables are highly statistically significant at conventional levels.

Sources: Author's calculations using the LEHD Program Employment Dynamics Estimates data base.

Table 7: The Effect Immigration On the Log of Real Annualized Wages of High and Low Skilled Natives, LEHD Pooled Data 1990-2000

	(1)	(2)	(3)	(4)
<i>High Skill Native Males</i>				
Percent High Skill Foreign Born (Firm)	0.607		0.431	0.204
Percent High Skill Foreign Born (SMSA)		2.666	2.561	-0.181
Percent Low Skill Foreign Born (Firm)	-0.590		-0.696	-0.178
Percent Low Skill Foreign Born (SMSA)		-1.147	-0.875	0.276
<i>Low Skill Native Males</i>				
Percent High Skill Foreign Born (Firm)	0.364		0.158	0.110
Percent High Skill Foreign Born (SMSA)		2.242	2.345	1.937
Percent Low Skill Foreign Born (Firm)	-0.503		-0.589	-0.154
Percent Low Skill Foreign Born (SMSA)		-0.892	-0.604	-0.852
<i>High Skill Native Females</i>				
Percent High Skill Foreign Born (Firm)	0.692		0.538	0.238
Percent High Skill Foreign Born (SMSA)		2.430	2.211	-0.142
Percent Low Skill Foreign Born (Firm)	-0.512		-0.615	-0.146
Percent Low Skill Foreign Born (SMSA)		-0.927	-0.732	0.311
<i>Low Skill Native Females</i>				
Percent High Skill Foreign Born (Firm)	0.562		0.343	0.183
Percent High Skill Foreign Born (SMSA)		2.710	2.658	2.264
Percent Low Skill Foreign Born (Firm)	-0.388		-0.468	-0.131
Percent Low Skill Foreign Born (SMSA)		-1.036	-0.873	-1.085
Additional Regressors				
Time Dummies	Yes	Yes	Yes	Yes
Experience Quartic	Yes	Yes	Yes	Yes
Firm and/or SMSA Size	Yes	Yes	Yes	Yes
SIC Industry Division	Yes	Yes	Yes	Yes
Education and Race	Yes	Yes	Yes	No
Person Dummies	No	No	No	Yes

Notes: The "pooled" data are comprised of annual observations from California, Florida, Illinois, Maryland, Minnesota, North Carolina, and Texas over the period 1990-2000. No single state contributed observations for all years. See Table 1. For each specification, separate regressions are run for native males and native females. T-statistics and standard errors are omitted as all variables are highly statistically significant at conventional levels.

Sources: Author's calculations using the LEHD Program Employment Dynamics Estimates data base.