

“Dude, Where’s My Job?” The Impact of Immigration on the Youth Labor Market

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Abstract

Most studies about the labor market impact of immigration limit their analysis to the adult native population. This paper shows that teen employment is significantly more responsive than adult employment to immigration, and that growth in low-skilled immigration appears to be an important cause of recent declines in teen employment rates. Using variation in immigrant shares across metropolitan areas between 1980 and 2000, I show that the impact of immigration on youth employment is at least twice as large as the impact on adults, and that immigration affects school enrollment decisions and the type of jobs held by native youth. These effects are strongest for black youth and youth from poorer and less educated families. The estimates suggest that a 10 percentage point increase in the immigrant share of a city’s low-skilled population reduces the teen employment rate by 5 percentage points, implying that up to half of the fall in teen employment between 1990 and 2005 can be explained by increased immigration.

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1 Introduction

The summer employment rate for high school-aged teenagers fell by over ten percentage points between the early 1990s and 2005. No other age group experienced such a dramatic decline in employment over this period. Declining teen employment rates have frequently been discussed by the press and policy communities¹, but there is little research exploring the causes of this trend. Potential explanations for this decline include growth in the use of high stakes testing and exit exam requirements (Smith 2007), greater labor market competition from other less-skilled workers such as immigrants and single mothers, and increased emphasis on high school and college education (Aaronson, Park and Sullivan 2006). Understanding why youth are less likely to work is important because some explanations (increased schooling) suggest that lost work experience is replaced with other forms of human capital, while other explanations (greater competition from low-skilled workers) do not necessarily have this implication.

The recent, large influx of less-educated and younger adult immigrants might seem to offer a potential explanation, but previous research generally estimates a small to modest impact of immigration on native adult low-skilled employment (Altonji and Card 1991 and Card 2001). Extrapolating from this existing evidence, one might conclude that the effect of immigration on teen employment is also minimal. Nevertheless, the actual youth employment response may be quite different than the adult response. On one hand, since adult low-skilled immigrants typically have more work experience than native teens, they may work in jobs that are less common among youth — so immigration may have an even smaller effect on teen employment than it does on adult employment. If there is some degree of labor market competition between immigrants and teens, however, youth labor supply may be more responsive to immigration because teens have fewer financial constraints that necessitate their labor income, teens can substitute time from labor to schooling and class work in addition to leisure, and teens' job search is more geographically constrained.

This paper analyzes the effects of immigration on teen employment outcomes and the type of jobs held by youth, and considers why these effects may differ between teens and

¹For example, Bureau of Labor Statistics 2002 and Sudeep Reddy, "Teen Behavior Offers Clue To Why Jobless Rate Stays Low Despite Slowing Growth", *The Wall Street Journal*, June 18, 2007.

adults, and within the youth population. Using Census microdata, I identify the impact of low-skill immigration on labor market outcomes for youth age 16 and 17 using variation in immigrant concentration across 100 Metropolitan Statistical Areas (MSAs) between 1980 and 2000. I compare these estimates to similar estimates for adults. To overcome the potential endogeneity of immigrant geographic concentration, I implement an empirical strategy commonly used in the literature by instrumenting the immigrant share of the city's population with a measure of predicted immigrant shares, where predicted shares are based on the geographic distribution of pre-existing immigrant stocks in 1970.

The paper has two key findings. First, I show that low-skilled immigration has a stronger effect on the employment rate of teens than on the employment rate of less educated adults: a 10 percentage point increase in the immigrant share of the low-skilled population (which is slightly larger than the average increase across cities between 1990 and 2000) reduces the percentage of teens employed in the reference week by 4.8 percentage points. This is over three times the percentage point effect for adults, and the difference is even larger relative to baseline employment rates. I estimate that the number of employed low-skill native adults falls by 12 and the number of employed native youth falls by 4 for every 100 low-skilled immigrants that enter an MSA, so excluding youth from the analysis significantly underestimates the employment impact of immigration. Employment effects of this magnitude explain some — but not all — of the fall in teen employment since the mid-1990s. Differences in labor supply elasticities can partially explain why immigration effects are larger for youth than adults.

The second major finding is that immigration has larger disemployment effects relative to baseline employment rates on native youth who come from poorer families or are minorities. These are populations with traditionally low employment rates, and a considerable amount of research attention has been devoted to documenting and explaining lower employment for black youth in particular (Freeman and Holzer 1986; Ihlanfeldt and Sjoquist 1998). I show that the employment effects of immigration are proportionately larger for these youth partially because they are more likely to live in urban centers, which is also where low-skilled immigrants are most concentrated. I also demonstrate that school enrollment rates for these populations increase slightly in response to immigration.

Only two recent studies examine the effect of immigration on youth outcomes. Aaronson, Park and Sullivan (2006) consider an extensive set of explanations for recent declines in youth employment. They test immigration as a cause by extending the Mariel boatlift analysis from Card (1990) to the youth labor market, and find that teen employment rates in Miami increased *more* than they did in comparable cities after the arrival of many low-skilled Cuban immigrants. Although this evidence is suggestive, it comes from a single case study, and average immigration effects across all cities may be different. Sum, Harrington, and Kathiwada (2006) uses 2003 American Community Survey data to estimate the cross-state relationship between the relative size of immigrant inflows into a state and employment rates for young natives (age 16-24). They find that a 1 percentage point increase in a state's population due to immigration is associated with a 1.2 percentage point reduction in the employment rate for young adults. Since this is a point-in-time relationship, it may not represent a causal estimate of immigration effects in a state over time.

The paper proceeds as follows. Section 2 describes the data I use for this analysis, and provides a brief description of trends in teen employment. Section 3 demonstrates that youth employment is more responsive than adult employment to immigration, and shows that larger labor supply elasticities for teens in combination with a binding minimum wage can explain the sizeable employment effects. Section 4 demonstrates that employment effects are proportionally larger for youth from less advantaged backgrounds, and tests explanations for this finding. Section 5 concludes by estimating the contribution of immigration to recent youth employment trends, and discussing welfare consequences of immigration on the youth population.

2 Data

My empirical analysis uses 1970, 1980, 1990, and 2000 Public Use Microdata Samples (PUMS) from the Decennial Census. Immigrant shares for an MSA are derived from the 1980, 1990, and 2000 5 percent samples. Following the literature, an individual is categorized as an immigrant if he or she reports being born abroad and being either a naturalized citizen or a non-citizen. Natives are all other individuals, regardless of their parents' citizenship status. Throughout most of the analysis, I instrument immigrant shares in 1980, 1990, and

2000 with a measure of predicted immigrant shares, where predicted shares are based on native and immigrant stocks in 1970 (as explained further in section 3.2). Immigrant and native stocks in 1970 are derived from the 1 percent Form 1 Metro and State samples. For some specifications, I also include the 2005 American Community Survey (ACS)².

Natives age 16 and 17 are the primary population of interest in this analysis. A key reason to focus on this population is that the fall in employment since 1990 is largest for this age group (Figure 1). Younger ages cannot be included, since employment status in the Census is not asked of individuals less than 16 years old. I exclude 18 year olds, because the primary focus of this research is on the labor market impact of immigration for those still in school and some 18 year olds may have graduated (or have been eligible to do so) by the time of the Census. The data appendix provides further details on sample selection and the construction of wage measures from the Census.

Figure 1 displays trends in the average annual employment rate for teen and low-skilled adults. Until the mid-1990s, youth and adult employment rates trended together, and adult employment rates exceeded youth rates by about 30 percentage points. The tight labor market of the late-1990s was characterized by rising adult employment, yet over these years teen employment rates remained stable at about 35 percent. Hence, teen employment began falling relative to adult employment in the mid-1990s. Although youth employment participation is highly seasonal, declining employment occurred during both the summer and non-summer months (Figure 2). Employment participation and wages are higher for non-blacks and teens from more highly educated or wealthier families (Appendix Table A1), though trends in the employment-population rate are comparable across all categories of youth over this period³.

Throughout this paper, immigration effects are estimated using variation in immigrant concentration across 100 Metropolitan Statistical Areas (MSAs). Individuals from the 100 MSAs with the largest average population size between 1970 and 2005 and which are consis-

²The ACS has been administered annually by the Census Bureau since 2000, and generally asks the same questions as the Census Long Form. However, the survey is administered throughout the year, and public use data does not include a monthly identifier. As a result, I do not pool Decennial Census and ACS data in my primary specifications when considering outcomes with seasonal variability, such as employment or school enrollment probabilities in the previous week. I include 2005 ACS data in some robustness checks.

³Graphs available upon request.

tently coded over all decades are included in the analysis. Immigrants are highly clustered in cities: over 70 percent of all low-skilled immigrants live in these MSAs. Table 1 displays low skilled immigrant shares for the included MSAs that have the highest and lowest immigrant shares in 1980. Two facts stand out. First, by 2000 immigrants make up over half of the low skilled adult population for the majority of the high immigrant MSAs. Second, the locational pattern of immigration changes across decades. Between 1980 and 1990, new immigrants tended to go where old immigrants had already settled, and so the immigrant share in high immigrant MSAs increased more than it did in areas that had fewer immigrants. After 1990, immigrants began settling in different areas - for instance, the low skilled immigrant share increased from 1.5 to 10 percent in Greensboro between 1990 and 2000.

The younger and less educated immigrant population has grown substantially in size since 1990 (Figure 3). Given somewhat similar levels of education and work experience, it is plausible that this group of immigrants may compete with native youth in the labor market. As shown in Table 2, there is some overlap in occupations common among low-skilled immigrants and youth. Male youth and low skilled adult immigrants tend to be cooks, stock handlers, and janitors, while female youth and adult immigrants tend to be cashiers and saleswomen.

3 Labor Market Impact of Immigration

3.1 Empirical Strategy and OLS Estimates

To estimate the impact of immigration on natives, I regress labor market outcomes for natives on a measure of low-skilled immigrant concentration for MSA c in year t , individual-level controls, and MSA and year fixed effects. Potential measures of immigrant concentration include the log of the low-skilled immigrant stock, the ratio of low-skilled immigrants to natives, and the immigrant share of the low-skilled population. Converted into the impact of one more immigrant into an MSA on the number of employed natives, the immigration effects that I estimate are similar regardless of how immigrant concentration is measured. Following much of the literature (Altonji and Card 1990; Borjas 2003, 2005; Ottaviano and Peri 2006), I use immigrant shares as the primary regressor of interest, where shares are defined as $\frac{I_{ct}}{I_{ct}+N_{ct}}$ and I_{ct} and N_{ct} are low-skilled immigrant and native adult stocks,

respectively⁴.

Figures 4A and 4B illustrate the main empirical result of this section. There is a strong negative relationship between changes in the low-skilled immigrant share of an MSA and changes in the youth employment rate of an MSA between 1980 and 2000. The relationship between changes in low-skilled immigrant shares and adult employment rates is much weaker.

The primary empirical specification for this analysis is:

$$y_{ict} = \gamma P_{ct} + \beta X_i + \alpha_c + \alpha_t + \varepsilon_{ict} \quad (1)$$

The regressor of interest, P_{ct} , is the immigrant share of the low skilled population in MSA c and year t as defined above. The dependent variable y_{ict} is one outcome from a set of labor market outcomes reported in the Census, including a dummy for employed last year, a dummy for employed last week, and hours worked in the last year (defined as weeks worked multiplied by usual hours worked per week). Individual-level controls (X_i) are age, age squared, race dummies, and gender dummies. Results from OLS estimates of γ in equation (1), separately for native teens and low-skilled adults, are shown in Table 3.

OLS estimates of (1) suggest that immigration has a large negative effect on teen employment outcomes. A 10 percentage point increase in the low-skilled immigrant share of the population is estimated to reduce the proportion of teens employed in the reference week by 4.6 percent, the proportion employed in the last year by 5.2 percent, and annual hours worked (unconditional on employment) by 33. For comparison, the low-skilled immigrant share of an MSA increased on average by 8 percentage points between 1990 and 2000. The estimated magnitude of these effects is at least three times as large as adult estimates, depending on the outcome variable considered.

⁴Borjas (2003) and (2005) argue that estimated immigration effects tend to be larger when using national variation in immigrant concentration within education-experience groups, and that estimates are smaller in magnitude when geographic variation is also introduced. Since teens represent a single education-experience group, I am unable to estimate immigration effects using only national-level variation. However, the employment effects that I estimate for low-skilled adults using geographic and time variation are quite similar to what Borjas finds for this population using only variation in immigrant concentration in national experience cells over time.

3.2 Instrumental Variables Estimates

3.2.1 Empirical Strategy

OLS estimates of γ might not represent a causal effect of immigration on native outcomes if immigrant concentration is endogenous to native labor market conditions. In particular, if immigrants decide to settle in areas that experience positive local labor market shocks, and if the true γ is negative, then $\hat{\gamma}$ will be biased towards zero and OLS estimates will be smaller in magnitude than the causal effects.

As a solution to bias from endogenous immigrant migration, I instrument immigrant shares with a measure of predicted shares (\hat{P}). Predicted shares are derived by predicting immigrant inflows to an MSA from the geographic concentration of immigrants in 1970, which is a commonly used instrument for immigration stocks⁵, and from predictions of native stocks absent interstate migration.

The prediction of immigrant inflows is based on the idea that immigrants tend to settle in areas where a larger share of their ethnic group (home country) have previously settled. Let $\hat{F}_{ct,1970}$ represent the predicted low skill immigrant inflows into MSA c between years 1970 and t (where $t \geq 1980$). Then:

$$\hat{F}_{ct,1970} = \sum_o F_{t,1970}^o \frac{I_{c,1970}^o}{I_{1970}^o}$$

where $F_{t,1970}^o$ is the flow of all low-skilled immigrants into the United States from originating country o between 1970 and t , and $\frac{I_{c,1970}^o}{I_{1970}^o}$ is the share of all immigrants from country o that lived in MSA c in 1970⁶. Hence, \hat{F} assigns incoming low-skilled immigrants from a specific country into a city based on the geographic density of immigrants in 1970. Predicted low-skilled immigrant stocks in MSA c at time t are then:

$$\hat{I}_{ct} = I_{c,1970} + \hat{F}_{ct,1970}$$

where $I_{c,1970}$ is the actual stock of immigrants in 1970.

⁵A variant of this instrumental variable strategy was proposed in Altonji and Card (1991), and has been implemented in Card (2001), Lewis (2003), Cortes (2006a), Lewis (2006), and Peri and Sparber (2007), among others.

⁶I divide the set of all possible originating countries into 15 country groups based on geography (group categories available upon request).

To form an estimate for native stocks that is purged of migration responses to immigration, I define predicted native low skill stocks in the absence of native migration, \hat{N}_{ct} , in the following way:

$$\hat{N}_{ct} = \sum_{a=18}^{64} N_{c,1970}^{a-(t-1970)} \frac{N_t^a}{N_{1970}^{a-(t-1970)}} \frac{LS_t^a}{N_t^a}$$

where $N_{c,t}^a$ is the native stock (unconditional on education) of age a in state c in year t . LS_t^a is the size of the low skill native population age a in t . The first term inside the summation represents the size in 1970 of the cohort that is age a in MSA c in t . The second term inside the summation represents the national change in population size between 1970 and t for the cohort that was age a in t (i.e. the survival rate between 1970 and t). The last term is the national share of the cohort age a in t that is low-skilled. \hat{N}_{ct} is the predicted size of the native low skill state adult population in year t if there had been no out of city migration, if the survival rate for each age cohort within an MSA followed the national survival rate, and if the native population did not adjust educational attainment in response to MSA-specific factors (i.e. constraining the low-skilled share of the native labor force to be constant across MSAs)⁷.

Predicted immigrant shares are then:

$$\hat{P}_{ct} = \frac{\hat{I}_{ct}}{\hat{I}_{ct} + \hat{N}_{ct}}$$

For \hat{P}_{ct} to be a valid instrument, it must be correlated with P_{ct} , and conditional on controls, must affect native labor market outcomes only through its effect on actual immigrant shares. This exclusion restriction will be violated, for instance, if immigrants in 1970 chose their location based on local labor market shocks which took decades to diminish. These shocks would induce city-year specific variation in labor market outcomes after 1970 that would not be absorbed by the separate city and year fixed effects in (1) (and would therefore be contained in ε_{ict}), and would be correlated with \hat{P}_{ct} .

⁷This formula is not implemented exactly as written, since age cohorts less than 20 in 1990 and 30 in 2000 were not alive in 1970. To compensate, cohorts of age a for which stocks cannot be predicted in year t are assigned population sizes based on the size of the population aged $a - 10$ in $t - 10$ multiplied by the national survival rate between t and $t - 10$ for the age cohort. For instance, 18 and 19 year olds in 1990 were not alive in 1970, so to predict their population size absent migration, the size of the 8 and 9 year old MSA cohorts in 1980 is multiplied by the national empirical survival rate for this age cohort between 1980 and 1990.

If variation in 1970 immigrant dispersion is due to persistent but *stable* differences in local labor market conditions, this will not violate the exclusion restriction because such variation will be absorbed by MSA fixed effects. The exclusion restriction will not be violated if immigrants in 1970 are attracted to areas that experience positive labor market shocks in 1970 which dissipate by 1980. Empirical evidence from Blanchard and Katz (1992) on the persistence of state-level employment and wage shocks suggests the impact of temporary labor market shocks disappears within about 10 years. Additionally, most results are robust to the inclusion of Census region dummies interacted with year dummies, so the exclusion restriction holds even if immigrants are attracted to *regions* of the country which have positive labor market shocks in 1970 that diminish over time.

Table 4 displays estimates from various city-level analogs to the first stage equation of the following form:

$$w_{ct} = \delta \hat{w}_{ct} + \theta_c + \theta_t + v_{ct} \quad (2)$$

where w_{ct} and \hat{w}_{ct} represent actual and predicted immigrant stocks (panel A) native stocks (panel B) and immigrant shares (panel C). All estimates are weighted by the size of the low-skilled population, and standard errors are clustered at the MSA level.

The relationship between predicted and actual immigrant stocks, native stocks, and immigrant shares is strong (column 1). Actual immigrant stocks are somewhat underpredicted by the predicted stock variable, actual native stocks are overpredicted by predicted native stocks, and actual immigrant shares are somewhat underpredicted. The strength of the relationship between actual and predicted immigrant stocks implies that the first stage relationship between actual and predicted shares — which is used for 2SLS estimation — is not driven solely by native stocks. The first stage relationship is robust to the exclusion of the earlier and later decade of data (columns 2 and 3), the inclusion of Census region/year fixed effects (column 4), and the inclusion of a large set of time-varying MSA controls⁸ (column 5). Excluding the three high-immigrant states has very little effect on the magnitude of the first stage relationship (column 6).

Finally, one would be concerned about the validity of the instrument if the majority

⁸These controls are the average age of the native population, and the share of the native population that is: black, male, high school dropouts, and college graduates.

of an ethnic group settles in one state, so that national inflows are driven by state inflows for that particular group⁹. Column 7 tests the robustness of the first stage relationship to this concern by constructing $F_{t,1970}^o$ as the inflow of immigrants into all areas other than city c , recalculating predicted immigrant stocks, and reestimating (2). The strength and magnitude of the first stage is robust to this specification.

As in previous studies (Card 2001 and Cortes 2006a), I find that the size of the native low skilled population in an MSA is relatively unresponsive to changes in immigration. To demonstrate this, I run the following regression at the MSA level using Census data from 1980-2000, instrumenting the log of the low skilled immigrant stock with the log of the predicted low skilled immigrant stock:

$$\log N_{ct} = \beta \log I_{ct} + \alpha_c + \alpha_t + v_{ct}$$

β is estimated to be -.04 with a standard error (clustered at the MSA level) of .14. Hence, there is no evidence to suggest that the size of the native low skilled population responds to immigration growth, and so changes in P_{ct} can be interpreted as coming mainly from changes in the size of the immigrant population rather than from a combination of immigrant inflows and native outflows.

3.2.2 Instrumental Variables Estimates

Table 5 presents instrumental variables estimates of (1). In all instances, estimated employment effects are larger in magnitude than OLS estimates from Table 2, but the difference between OLS and IV results is not large. This suggests that the potential endogeneity of immigrant shares is not a significant source of bias¹⁰. IV estimates imply that a 10 percentage point increase in the low-skilled immigrant share of the population reduces teen weekly employment rates by 4.8 percentage points, teen annual employment rates by 5.5 percentage points, and the average total number of hours worked in a year by 29. Employment effects

⁹For instance, 27% of Mexican immigrants lived in Los Angeles in 1970. If the L.A. labor market experiences a positive shock between 1970 and 1980 and consequently attracts Mexican immigrants, then predicted Mexican inflows to L.A. will be somewhat driven by actual inflows (this is because inflows to L.A. represent a large share of national inflows). In this case, predicted inflows will be positively related to local labor market conditions, violating the exclusion restriction.

¹⁰In specifications that use $\log I_{ct}$, the difference between OLS and IV results is more significant. I show this in section 3.3.

for teens remain at least three times as large as estimated adult effects, and the difference is even larger relative to baseline employment rates¹¹.

How many native adults and teens are displaced from employment for every additional low-skilled immigrant? To answer this question, I convert estimates of the relationship between immigrant shares and native weekly employment rates (column 1 of Table 4) into the implied impact of one additional low-skilled immigrant on the number of employed native teens and adults in an MSA¹². Teens form about 2 percent of the employed native low-skilled population, so if teen displacement from immigration is proportional to the share of teens in the employed native population, and if there is perfect (one-for-one) displacement between immigrants and natives, 100 additional immigrants would reduce the number of employed low-skilled adults by 98 and the number of employed teens by 2. Put differently, 2.04 employed teens would become unemployed for every 100 employed adults who lose their jobs due to immigration.

I estimate that for every additional 100 low-skilled adult immigrants that enter an MSA, the number of teens employed in the last week falls by 4 and the number of adults employed in the last week falls by 12, for a total of 16 displaced natives. Ignoring the effects of immigration on teens would reduce the estimated employment impact by one quarter of the actual impact. These estimates imply that about 33 teens are displaced for every 100 native adults who lose their jobs due to immigration. This is significantly larger than if the effect of immigration on the number of employed youth relative to adults equaled the youth share of the employed low-skilled population.

¹¹Adult employment effects are no larger than previous estimates in the literature. For instance, Borjas (2003) estimates that a 10 percentage point increase in the immigrant share of the high school dropout population reduces the number of weeks worked in the year by about .4 weeks (weeks worked is the only employment outcome reported in Borjas 2003). In unreported results, I estimate that immigration growth of this size reduces the number of weeks worked for this adult population by .6 weeks and reduces the number of weeks worked for teens by 1.6 weeks.

¹²I use the following calculation: $\frac{\partial L_{ct}^g}{\partial I_{ct}} = n_{ct}^g \frac{\partial EMP_{ct}^L}{\partial P_{ct}} \frac{\partial P_{ct}}{\partial I_{ct}}$, where $\frac{\partial L_{ct}^g}{\partial I_{ct}}$ is the impact of one additional low-skilled immigrant in a city on the number of employed natives of group g (either low-skilled adults or teens), n_{ct}^g is the size of group g in city c in year t , $\frac{\partial EMP_{ct}^L}{\partial P_{ct}}$ is the immigration effect estimated in column 1 of Table 4, and $\frac{\partial P_{ct}}{\partial I_{ct}} = \frac{N_{ct}}{(I_{ct}+N_{ct})^2}$. Using estimates of n_{ct}^g and $\frac{N_{ct}}{(I_{ct}+N_{ct})^2}$ from Census data, I calculate $\frac{\partial L_{ct}^g}{\partial I_{ct}}$ for each city-year, and average across cities and years.

3.3 Robustness of Estimates

This section presents robustness checks of estimated annual employment effects for the teen population (Table 6). Panel A displays estimates from testing the robustness of the primary results to different specifications of the immigrant share variable. Estimates from Table 2 and 4 are repeated in columns 1 and 2 of panel A. Columns 3 and 4 include the immigrant share of the high skilled population as an additional regressor, where the high skilled population is defined over all adults with at least some college experience, and high skilled shares are instrumented with predicted high skilled shares (which are constructed with predicted high skill immigrant and native stocks). Low skilled immigration effects are, if anything, strengthened by the inclusion of high skilled immigrant shares, and the effect of high skilled immigration is imprecisely estimated¹³. Columns 5 and 6 replace the low skilled immigrant share with the log of the number of low-skilled immigrants (controlling for the log of the number of low-skilled natives). A 10 percent increase in the size of the low-skilled immigrant population, conditional on the size of the native low-skilled population, is estimated to reduce the proportion of teens employed in the last year by 1.6 percentage points. Compared to estimates using immigrant shares, these imply somewhat *larger* immigration effects¹⁴.

Estimated employment effects remain sizeable in magnitude and precisely estimated when observations from 1980 or 2000 are excluded from the analysis, or when MSAs from the highest immigration states are excluded (panel B). Employment effects are larger in magnitude in the later period (column 2) than the earlier period (column 4). Excluding observations from the high immigration states has little effect on estimated employment effects (column 6).

In panel C, I address concerns that changes in predicted immigrant shares may be corre-

¹³This is not due to a weak first stage; the coefficient on predicted high skill immigrant shares from the analog to (2) is .73 with a standard error of .05.

¹⁴Between 1980 and 1990, the immigrant share of an MSA increased by 6.5 percentage points on average, and the log of the number of low-skilled immigrants rose by .21 on average — each estimate implying that teen weekly employment rates were about 3.1 percentage points lower than they would have been in the absence of immigration growth regardless of how immigration concentration is measured. Between 1990 and 2000, similar calculations imply that, in the absence of changes in immigrant concentration, teen weekly employment rates would have been 4 percentage points higher. Had log immigrant stocks remained at their 1990 levels, teen employment rates are estimated to have been 9 percentage points higher.

lated with other time-varying MSA characteristics that also affect employment. Columns 1 and 2 add Census region dummies interacted with year dummies. Point estimates are quite similar to those in the original specification. Columns 3 and 4 report estimates from adding 2005 American Community Survey data to the analysis. Columns 5 and 6 add MSA-specific time trends as well. In this specification, a 10 percentage point increase in the low skill immigrant share is estimated to reduce the probability of teen employment by 3.7 percentage points, which, though less precisely estimated, is still an economically significant effect¹⁵.

3.4 Immigration Effects by Age

Figure 5A provides striking visual evidence that the employment effects of immigration are concentrated among the youth. In this figure, I plot the coefficient on low-skilled immigrant shares, $\hat{\gamma}$, from estimating equation (1) independently for each age from 16 to 64. Again, the employment effects of immigration are strongest for the younger ages and diminish rapidly in magnitude through the late teens and early 20s, stabilizing around -.2 for individuals in their mid-20s through 50s, and declining in magnitude for older individuals.

One reason why the employment effects of immigration as estimated from equation (1) and presented in Table 5 are larger for teens than for 21-64 year olds may be because low-skilled immigrant populations are younger and hence more comparable in terms of work experience with youth¹⁶. In other words, the relationship between low-skilled immigrant shares and teen employment may be larger in magnitude than that between immigrant shares and the employment rate for 21-64 year olds because the age composition of the low-skilled immigrant population becomes younger between 1980 and 2000, rather than because native youth employment is more responsive to immigration from similarly experienced immigrants.

To test whether employment effects are larger for youth because youth are more respon-

¹⁵Both OLS and IV estimates using MSA-specific time trends are smaller in magnitude than those which exclude time trends, though the difference between OLS estimates is larger than the difference between IV estimates. One explanation for this is that, after including time trends, much of the remaining variation in immigrant shares is measurement error. Consistent with this explanation, instrumenting for immigrant shares has a substantial impact on the estimated employment effects of immigration once MSA time trends are included. Point estimates from adding MSA-specific time varying controls (including the average age of the native population, and the share of the native population that is black, male, a high school dropout, and a college graduate) are quite similar to those from the initial specification.

¹⁶The average age of the low-skilled immigrant population of the country is 51 in 1980 and 42 in 2000.

sive to immigration from immigrants of a similar age, I estimate the following for each age a from 16 to 24:

$$y_{ict}^a = \gamma^a P_{ct}^a + \beta X_i + \alpha_c + \alpha_t + \varepsilon_{ict} \quad (3)$$

This specification differs from that used to estimate Figure 5A since immigrant shares now vary *by age*. For natives of age a , P_{ct}^a is constructed as the immigrant share of the entire low-skilled population between ages $a - 5$ and $a + 5$ in city c and in year t ¹⁷, and P_{ct}^a is instrumented with predicted immigrant shares for that age group. This incorporates the idea that immigrants and natives with similar amounts of potential work experience should be most substitutable, and addresses the concern that estimated immigration effects on adults 21-64 were small because they aggregated younger adults with older adults who are unlikely to be affected by younger immigrants. I estimate (3) for ages 16 to 64 with 2SLS, and present the plot of $\hat{\gamma}^a$ by age in Figure 5B. Estimating immigration effects in this way only strengthens the conclusion from the previous section: the employment effects of immigration are significantly stronger for teens than for adults, and this is because teen employment is more responsive to immigration, rather than because the immigrant population tends to be more similar in experience to youth than to older workers¹⁸.

3.5 Impact of Immigration on Type of Occupation

Native disemployment in response to immigration should be greater in occupations that are more common among immigrants. As an additional robustness check to my measure of immigrant concentration, in this section I test whether disemployment effects are smaller in occupations for which natives have a comparative advantage over immigrants — such as jobs that rely more heavily on English language skills, and verbal and interpersonal skills and abilities¹⁹.

¹⁷For individuals less than 21 years old, immigrant shares are calculated over ages 16 to 26.

¹⁸A 10 percentage point increase in the low-skilled immigrant share of one's 10 year experience group in his or her city is estimated to reduce the percent of teens employed in the last week by 8.3 percentage points and the percent of adults 21-64 employed in the last week by .5 percentage points.

¹⁹This is similar to analysis from Cortes (2006b) and Peri and Sparber (2007) for the native adult population. Cortes (2006b) demonstrates that immigrants tend to work in occupations which require fewer verbal skills, and in response to immigration, the immigrant share of an occupation increases by more in jobs that are less English-intensive. She also shows that immigration has a more negative effect on the wages of natives in less English-intensive occupations. Peri and Sparber (2007) shows that native labor supplied

To define the level of English language skills, and communication skills and abilities required for a job, I use the US Department of Labor’s Occupational Information Network (O*NET), which classifies the level (on a 1-7 scale) and importance (on a 1-5 scale) of various skills, abilities, activities, and required knowledge for over 800 occupations (of which around 300 can be matched with Census occupations). For each occupation, I define a communication skills index based on the normalized sum of the level and importance scores for a large set of relevant skills and abilities²⁰. I then calculate each occupation’s communication index percentile (ranging from 0 to 1) in the population-weighted distribution of all jobs, using the occupation distribution in 2000 and most recent skills classification from O*NET. As evidence that low-skilled immigrants are less likely to work in occupations that require stronger communication skills, the coefficient on communication percentile from an occupation-level regression of the 1980 share of immigrants in an occupation on communication percentile is -.37 and is significant at the 1 percent level. Occupations that have a high verbal percentile and are common among youth include secretaries, teacher’s aides, and customer service representatives. Common low verbal percentile jobs for teens include gardeners, farm workers, and construction laborers.

I estimate the following equation at the occupation-city-year level:

$$\log(\# \text{ employed})_{oct} = \gamma P_{ct} + \delta P_{ct} \cdot \text{comm pctile}_o + \theta_o + \theta_c + \theta_t + \varepsilon_{oct} \quad (4)$$

The dependent variable, $\log(\# \text{ employed})_{oct}$, is the log number of employed teens or employed low-skilled native adults in occupation o in MSA c in year t . Occupation o ’s rank in the communication skills and abilities distribution of all jobs, as described above, is comm pctile_o and ranges from 0 to 1. The potentially endogenous variables in (4) are P_{ct} and $P_{ct} \cdot \text{comm pctile}_o$. I instrument for P_{ct} as before, and instrument for $P_{ct} \cdot \text{comm pctile}_o$

to manual tasks relative to native labor supplied to more interactive tasks (directing, controlling, planning) falls in response to low-skilled immigration within a state, suggesting that natives adapt to immigration by specializing in jobs for which they have a comparative advantage over immigrants.

²⁰The communication index aggregates the level and importance scores for the abilities “oral comprehension,” “oral expression,” “written comprehension,” “written expression,” “speech clarity,” and “speech recognition”; for the skills “speaking” and “active listening”; and for “knowledge of the English language.” For each occupation, the level at which the skill is required is scored on a scale of 1-7, and the importance of the skill for the job is scored on a scale of 1-5. I normalize each level and importance score to 1, and for each occupation sum the level and importance scores for all 9 categories. The occupation’s raw verbal score is this sum, and ranges from 0-18.

using \hat{P}_{ct} and its interaction with $comm\ pctile_o$. Growth in the immigrant concentration of an MSA reduces employment in occupation o if $\gamma + \delta comm\ pctile_o < 0$, while $\gamma + \delta comm\ pctile_o > 0$ indicates that immigration growth causes employment *growth* in occupation o . If $\delta > 0$, employment declines are smaller (or employment gains are larger) in occupations which require more communication skills and abilities.

The number of employed teens in the least communication-intensive occupations ($comm\ pctile_o = 0$) are estimated to fall by up to 8.5 percent in response to a 10 percentage point increase in the low-skilled immigrant share of an MSA (Table 7). The number of employed native adults in these occupations is estimated to fall by 24 percent. Since $\hat{\delta} > 0$, employment declines are smaller in more communication-intensive jobs, and teen employment is estimated to *increase* in the most communication-intensive jobs in response to immigration. Growth in the immigrant concentration of 10 percentage points is estimated to increase the number of teens employed in the most communication-intensive occupations by about 1 percent²¹. Since native disemployment in response to immigration is smaller in occupations for which natives have a comparative advantage, this is additional evidence that native employment responds to changes in immigrant concentration.

3.6 Effect of Immigration on Wages

3.6.1 OLS and 2SLS Estimates of Immigration Effects on Wages

Why are the employment effects of immigration so much larger for teens than for adults? One explanation for this finding is that immigration reduces native wages and that teen labor supply is more responsive to changes in the wage. Reasons for this may include that teens have fewer financial constraints which necessitate their income²², that teens have higher disutility of labor, and that teens can more readily substitute from labor to schooling as well as from labor to leisure.

To assess whether teens are more responsive to changes in the wage, I first estimate (1) with OLS and 2SLS for teens and low-skilled adults using log hourly wages as the dependent

²¹ Although adult employment is estimated to fall more in percentage terms than teen employment for a given occupation, the overall employment effects on youth are still estimated to be larger. This is because a greater share of native teens are employed in jobs which require few communication skills.

²² Johnson and Lino 2000 provides evidence that a teen's labor income is used primary for his or her own personal use, rather than for contributing to household expenses.

variable²³. These estimates are presented in columns 1, 2, 4 and 5 of Table 7. A 10 percentage point increase in the low-skilled immigrant share of the population is estimated to reduce teen wages by 1.4 percent, and adult wages by .6 percent. These estimates are small in magnitude and imprecisely estimated — a common finding in studies that identify immigration effects from geographic variation in immigrant concentration (Card 2001, Cortes 2006). Combining these estimates with estimated employment effects from Table 5 implies implausibly large employment participation elasticities (over 3 for adults and over 8 for teens)²⁴.

Recent research provides some explanations for why the impact of immigration on the average adult wages in a local labor market is small. Lewis (2006) and (2003) demonstrate that the choice of production techniques within industries — particularly, technology choice — is especially responsive to the size of the low skilled population. Thus, endogenous production decisions (i.e. heavier use of manufacturing techniques that more efficiently utilize low skilled labor) may mitigate the wage effects of immigration. However, these studies mainly focus on adjustments in manufacturing industries, which are smaller employers of youth than of low-skilled adults or immigrants²⁵. Peri and Sparber (2007) demonstrate that natives respond to immigration by moving to occupations for which they have a comparative advantage (such as jobs which require stronger verbal or interpersonal communication skills), and Cortes (2006b) shows that the wage effects of immigration are smallest for natives who work in occupations for which verbal skills are more important. Hence, the observed effect of immigration on adult wages is mitigated because adults partially respond to immigration growth by moving to occupations that face less immigrant competition. Although this is a potential explanation for the small estimated impact of immigration on adult wages, there is little difference in the impact of immigration on teen wages across

²³For these regressions, I also include the log of the state minimum wage and the following city level controls: the average age of the native population, and the share of the native population that is black, male, a high school dropout, and a college graduate.

²⁴For instance, a 10 percentage point increase in the low-skilled immigrant share of the population reduces teen employment in the previous week by 4.82 percentage points from an average of 31.7 percent — or, by 15 percent. From 2SLS estimates, an immigration increase of this magnitude reduces teen wages by 1.4 percent. The ratio of these two effects (10.6) is an estimate of employment responsiveness to a change in the wage.

²⁵8 percent of employed teens in the 1980 Census (2 percent in the 2000 Census) were employed in manufacturing industries. 25 and 33 percent of low-skilled native adults and immigrants were employed in manufacturing in 1980, respectively (19 and 21 percent in the 2000 Census).

occupations²⁶.

Two additional explanations for small wage effects are relevant for the youth labor market. First, since immigration substantially affects youth employment, selection bias is a significant concern. If immigration has larger employment effects on teens with lower earnings ability, then the estimated impact of immigration on observed wages confounds the effect of immigration on the offered wage with the effect of immigration on the composition of the employed youth population. Second, the minimum wage is more binding for youth wages than for adult wages, and a strongly binding minimum wage will mitigate wage adjustment from immigration. I next address each of these explanations.

3.6.2 Selection Bias

If teens with lower earning ability are more likely to drop out of the labor force in response to immigration, then the observed immigration effect is a combination of two effects: the impact of immigration on the offered wage of teens, and compositional effects (selection bias) because individuals with higher earnings ability are more likely to remain employed. Although it is not possible to directly examine whether the underlying earnings ability of those who are employed exceeds that for those who experience disemployment, I demonstrate changes in the composition of observed characteristics for the employed teen population by estimating the following equation:

$$\frac{\# \text{ employed educated}_{ct}}{\# \text{ employed less educated}_{ct}} = \psi P_{ct} + \beta \frac{\# \text{ educated}_{ct}}{\# \text{ less educated}_{ct}} + \theta_c + \theta_t + \nu_{ct} \quad (5)$$

The dependent variable proxies as a measure of the skill composition of the employed teen population of MSA c in year t . It represents the ratio of employed youth with more educated parents to employed youth with less educated parents, where youth from less educated parents are defined as those with at least one parent who is a high school dropout, and those with educated parents are defined as all other youth. In 2000, the average wage for teens

²⁶To test this, I have estimated the following regression at the individual level:

$$\log \text{ wage}_{ict} = \gamma P_{ct} + \delta P_{ct} \cdot \text{comm pctile}_o + \xi \text{comm pctile}_o + \beta X_i + \varphi W_{ct} + \alpha_c + \alpha_t + \varepsilon_{ict}$$

Given the likelihood of selection into employment and into occupations, however, these estimates are only suggestive. For teens, I find that $\hat{\gamma} = -.145$ (.094) and $\hat{\delta} = .006$ (.050). For adults, $\hat{\gamma} = -.315$ (.156) and $\hat{\delta} = .571$ (.066). The wage impact of immigration is uniform across occupations for teens, while it is less negative for more communication-intensive occupations for adults.

with more educated parents was \$7.72 and the average wage for other teens was \$7.57 — so this ratio is a summary measure of the observed earnings ability composition for the employed youth population. To control for the composition of the entire youth population (i.e. unconditional on employment), I include $\frac{\# \text{ educated}_{ct}}{\# \text{ less educated}_{ct}}$. If the share of the employed population from more educated families increases due to immigration growth, then $\psi > 0$. The OLS estimate of ψ is 21.0 (with standard error of 12.5), and the 2SLS estimate of ψ is 33.6 (with standard error of 18.1). A 10 percentage point increase in the low-skilled immigrant share is predicted to increase the ratio of employed youth with more educated parents to those with less educated parents by 3.4 (for comparison, the average across MSAs is 6.5). This is suggestive evidence that immigration growth causes the average earnings potential of the employed youth population to increase due to compositional changes. Although the observed difference in earnings potential between youth from different family backgrounds is not large (an hourly wage difference of \$.20 in 2000), selection on observable characteristics suggests that selection on unobserved characteristics may also be present. Hence, the observed effect of immigration on wages is its effect on offered wages (which is assumed to be negative) combined with its effect on the composition of the employed youth population (which is likely to be positively related to the wage). The impact of immigration on observed wages will therefore be more positive than the impact of immigration on offered wages.

Selection bias in wage equations has traditionally been modeled by assuming linear offer wage and reservation wage equations, and making distributional assumptions about the error terms in both equations (Heckman 1979). Since the immigrant share is potentially endogenous and affects both selection and the wage, I am unable to implement a standard Heckman selection correction procedure. Assuming that an individual's log offered wage is $w_{ict} = \gamma P_{ct} + \beta X_i + \alpha_c + \alpha_t + \varepsilon_{ict}$, that individuals work only if their offered wage exceeds their reservation wage w_{ict}^* where $w_{ict}^* = \delta X_i + \zeta_c + \zeta_t + u_{ict}$, and that u_{ict} and ε_{ict} have a bivariate normal distribution, then a simple solution motivated by the Heckman-type correction and as used in Card (2001) is to note that the effect of immigration on observed wages can be expressed as: $\frac{\partial E[w_{ict}|w_{ict} > w_{ict}^*]}{\partial P_{ct}} = \gamma + \rho \sigma_\varepsilon \frac{\partial \lambda(\pi_{ct})}{\partial \pi_{ct}} \frac{\partial \pi_{ct}}{\partial P_{ct}}$.

In this expression, w_{ict} is individual i 's offered wage, w_{ict}^* is i 's reservation wage, $\lambda(\pi_{ct})$

is the Inverse Mills Ratio (IMR) expressed as a function of the annual employment rate of MSA c in year t (π_{ct}), ρ is the correlation between errors in the offered wage and selection equations, σ_ε is the standard deviation of residuals in the offered wage equation, γ is the effect of P_{ct} on offered wages, and $\frac{\partial \pi_{ct}}{\partial P_{ct}}$ is the effect of immigrant concentration on annual employment probabilities. I use IV estimates of $\frac{\partial \pi_{ct}}{\partial P_{ct}}$ and $\frac{\partial E[w_{ict}|w_{ict} > w_{ict}^*]}{\partial P_{ct}}$ from Tables 4 and 6, I estimate the slope of the IMR at the average value of π_{ct} for teens and adults, and I estimate σ_ε from the data. I assume moderate correlation between residual earnings ability and employment likelihood and set $\rho = .5$. The effect of immigration on offered wages is $\frac{\partial E[w_{ict}|w_{ict} > w_{ict}^*]}{\partial P_{ct}} - \rho \sigma_\varepsilon \frac{\partial \lambda(\pi_{ct})}{\partial \pi_{ct}} \frac{\partial \pi_{ct}}{\partial P_{ct}}$. These estimates are presented in columns 3 and 6 of Table 6. Wage effects are negative and larger in magnitude than 2SLS estimates: a 10 percentage point increase in the low-skilled immigrant share reduces teen wages by 3.6% and adult wages by 1.1%.

The combination of employment effects estimated in Table 5, and selection-corrected wage effects imply that the teen weekly employment participation elasticity (the responsiveness of employment in the reference week to changes in the wage) is 4.2, and that the annual employment participation elasticity is 3.3. These estimates are larger than the implied labor supply elasticities for low-skilled adults, and to my knowledge these are the first estimates of teen labor supply elasticities. Elasticities for adults, though imprecise, are somewhat larger than most previous estimates. For example, Meyer and Rosenbaum (2001) uses the expansion of the EITC in the 1980s and 1990s to estimate employment participation elasticities for single low income mothers, and find weekly employment elasticities of .83 and annual employment elasticities of 1.07. Using immigration-induced wage and employment changes, Borjas, Grogger and Hanson (2006) estimates annual participation elasticities of .8 for low-skilled black males, and .2 for low-skilled white males.

3.6.3 Youth Wages and the Minimum Wage

A potential explanation for the combination of large youth employment effects and small youth wage effects from immigration (which together imply large youth labor supply elasticities) is that a binding minimum wage prevents further downward wage adjustment while still permitting teen employment to decline. As shown in Figure 6, if the minimum wage is

binding or is nearly binding for teens, and an increase in immigration reduces demand for teen labor (from D to D') enough that the minimum wage binds, then there will be an excess supply of teen labor. The resulting wage-employment outcome will not be on the teen labor supply curve, and the labor supply elasticity estimated from wage and employment changes will be an overestimate of the true labor supply elasticity²⁷.

There is some suggestive evidence that a binding minimum wage inhibits wage adjustment from immigration for teens. Imputed hourly wages for a large proportion of the youth population are no greater than the minimum wage, although the share of the employed youth population earning more than the minimum wage has risen as the real value of the minimum wage has fallen. In 1980, the federal minimum wage exceeded the national median hourly teen wage as calculated in the Census. The federal minimum wage gradually became less binding over the next two decades: it was \$3.80 in 1990 while the median wage for teens was \$4.00, and it was \$5.15 in 2000 while the median wage was \$5.71. In 1980, the federal or state minimum wage exceeded the median youth wage in every state. In 2000, this was true for only 7 states. Nonetheless, between 1980 and 2000, minimum wages were binding for a significant fraction of the youth population.

If a binding minimum wage supported the teen wage distribution and mitigated the wage effects of immigration, then the wage impact of immigration should be smaller in states for which the minimum wage is more binding (i.e. states where the wage has less room to adjust). 2SLS estimates suggest that this is true for the impact of immigration on youth wages, but not for the impact on adult wages. Estimates are not sufficiently precise to draw firm conclusions, however²⁸.

²⁷The initial equilibrium amount of youth labor is L^* , and the equilibrium wage is w^* . If low-skilled immigrants and teens are somewhat substitutable, then immigration growth will reduce the demand for teens, shifting the demand curve from D to D' . For a given wage, if employers prefer immigrants over native youth (since immigrants may be willing to work longer hours in more difficult work conditions, or may be more willing to remain employed throughout the school year), then youth employment may fall to a point such as L^{\min} . The new wage-labor outcome is $\{w^{\min}, L^{\min}\}$, which is not on the youth labor supply curve. From observed wage and employment changes, the estimated labor supply elasticity would be $\frac{(L^* - L^{\min})}{L^*} / \frac{(w^* - w^{\min})}{w^*}$, which is larger in magnitude than the actual labor supply elasticity at $\{w^*, L^*\}$.

²⁸I estimate the following: $y_{ict} = \gamma P_{ct} + \delta P_{ct} \cdot bind_{ct} + \xi bind_{ct} + \beta X_i + \xi W_{ct} + \alpha_c + \alpha_t + \varepsilon_{ict}$, where $bind_{ct} = \log(\text{median teen wage})_{ct} - \log(\text{min wage})_{ct}$, and W_{ct} are the city level controls included in the wage equations estimated in Table 6. In this specification, $bind_{ct}$ is a measure of state wage levels relative to the state or federal minimum wage. This is a commonly used measure of the bindingness of the minimum wage — see Lee 1999, for instance. A larger (more positive) value indicates that the minimum wage is less binding. IV estimates of this equation yield $\gamma = .163(.124)$ and $\delta = -.469(.421)$. Although these estimates are quite

4 Immigration Effects for Minority and Less Advantaged Youth

4.1 Employment Effects of Immigration

An extensive body of research has documented that employment rates for youth from less advantaged backgrounds — black youth in particular — are lower than those for other groups (Ihlanfeldt and Sjoquist 1990). One explanation that has received some empirical support is the spatial mismatch hypothesis, which argues that suburbanization of jobs combined with blacks’ lack of mobility from the inner city to the suburbs is a primary cause of black joblessness (Ihlanfeldt and Sjoquist 1998; Raphael 1998; Weinberg 2000). Since low-skilled immigrants are more concentrated in the urban center of an MSA than in the suburbs of an MSA²⁹ and minority youth or youth from poorer families (in the bottom quartile of the family income distribution) are also more likely to live in the urban center of an MSA³⁰, the effects of low-skilled immigration into an MSA may be particularly strong for these youth.

I begin by showing that employment effects are proportionately greater for these populations. The primary estimation equation for this section is:

$$y_{ict} = \psi P_{ct} \cdot d_i + \pi P_{ct} \cdot (1 - d_i) + \varphi d_i + \sigma X_i + \phi_c + \phi_t + \nu_{ict} \quad (6)$$

Immigrant shares are interacted with d_i and $(1 - d_i)$, which are dummy variables indicating whether the youth is black, from a poorer family (their family is in the bottom quartile of the household income distribution), or lives in the center city of an MSA. P_{ct} is the low skilled immigrant share of the population, and the interactions between P_{ct} and d_i , and P_{ct}

imprecise, they suggest that areas with less binding minimum wages (higher values of $bind_{ct}$) experience larger wage declines in response to immigration growth. This is consistent with a binding minimum wage that mitigates wage effects. Since the minimum wage is less binding for native adults (the median wage for low-skilled natives always exceeds the state and federal minimum), there is no a priori reason to expect the effect of immigration on adult wages to be larger in states for which the minimum wage is more binding relative to adult wage levels. Estimating a similar equation for native low-skilled adults finds $\gamma = .049(.107)$ and $\delta = .144(.102)$. The impact of immigration on adult wages is *smaller* in areas with less binding minimum wages.

²⁹In 2000 for instance, the low-skilled immigrant share of an MSA’s center city was 33% on average, and was 28% on average outside of the center city. 57% of low-skilled immigrants in an MSA lived in its center city, on average.

³⁰In 2000, 61 percent of black teens versus 23 percent of non-black teens lived in the center city of an MSA, and 51 percent of teens from poorer families versus 25 percent of other teens lived in the center city of an MSA.

and $(1 - d_i)$ are instrumented with the interactions between \hat{P}_{ct} and d_i , and \hat{P}_{ct} and $(1 - d_i)$.

Table 9A presents 2SLS estimates of this equation, separately for male and female teens (columns 1 and 2), where y_{ict} indicates whether individual i was employed in the reference week. Panel A compares the impact of immigration on black youth to other youth, panel B compares the impact on youth from poorer families to other youth, and panel C compares the impact on youth from urban areas (living in the center city of an MSA) to all other youth. Black youth, youth from poorer families, and urban youth have lower employment rates on average (at least 10 percentage points below all other youth), so an equal percentage point impact of immigration on employment represents a larger immigration effect, relative to baseline rates, for these populations. To scale the impact of immigration by baseline employment rates, I divide the effect of a 10 percentage point increase in the low-skilled immigrant share by the average employment rate for each group (reported in brackets to the right of the mean).

The magnitude of immigration effects on employment rates is greater for white youth, youth from wealthier families, and youth who do not live in the center city of an MSA. The effect of immigration on employment rates relative to average employment rates, however, is larger for youth with lower overall employment rates³¹. For instance, a 10 percentage point increase in low-skilled immigrant shares is estimated to reduce the employment rate of black males by about 23 percent (4.0 percentage points) and the employment rate of non-black males by 16 percent (5.7 percentage points). There is little difference in employment effects by gender.

Since employment effects are proportionately larger for urban youth (panel C), the impact of immigration on black youth employment may be particularly large because black youth are also more likely to live in the center city of an MSA. To test the plausibility of this explanation, columns 1 and 2 of Table 9B (panel D) present estimates of immigration effects on the employment of urban youth and other youth, conditional on being black. Although employment rates are lower, on average, for black urban youth compared to all other black youth, the magnitude of immigration effects on employment are larger for

³¹The same conclusion holds if immigration effects are estimated with an IV probit model rather than a 2SLS linear probability model.

urban youth. Conditional on living in the center of a city, immigration employment effects are not proportionately larger for black youth (panel E), as they are in the unconditional estimates. This is suggestive evidence that one reason why low-skilled immigration has a proportionately large impact on black youth employment is that black youth are more likely to live in the center city of an MSA, and that the employment effects of immigration are larger for urban youth.

Another potential reason why the employment effects of immigration are proportionately larger for youth from less advantaged backgrounds is that these youth are more likely to work in occupations that are prevalent among immigrants. Youth tend to work in similar occupations regardless of family background or minority status, however, so differential immigration effects are unlikely due to differences in the youth occupational distribution³².

4.2 Immigration and School Enrollment

Since disadvantaged youth are more likely to drop out of high school than other youth (Appendix Table A1), and they are more likely to report being employed and not in school, they can more realistically substitute from labor to schooling as well as to leisure. This added dimension of substitutability provides an additional channel through which immigration may differentially impact the less advantaged population.

Column 3 and 4 of Table 9A present estimates of (6), where y_{ict} is a dummy indicating whether an individual reported being enrolled in school at any point in the two months prior to the Census reference week. Immigration is estimated to significantly increase enrollment rates among youth from poorer families and urban youth: a 10 percentage point increase in the low-skilled immigrant share of the population increases the proportion of these youth that are enrolled in school by 1 to 1.3 percentage points, relative to average enrollment rates of around 90 percent. These enrollment effects may be coming through two channels. First,

³²For each category of youth (based on family background or race), I calculate the employed share of that group in each occupation. For instance, 10.5 percent of employed black teens in 1970 were janitors. I make the same calculations for low-skilled adult immigrants. I compare occupational distributions by calculating the correlation in these shares between any two groups. The occupational distribution of teens is quite similar, regardless of which groups are considered. For instance, the correlation between the distribution for youth from lower income families in an occupation and for all other youth is .91, and the correlation between blacks and whites is .92. The correlation between the share of low-skilled adult immigrants and youth in an occupation ranges from .49 to .57 depending on which category of the family income level or race of the youth is considered.

since immigration reduces offered wages in the youth labor market, school enrollment may rise due to a reduction in the opportunity costs of attending school. Second, to the extent that youth perceive a reduction in job opportunities in the low-skilled adult labor market due to immigration, low-skilled immigration growth may increase the perceived returns to education. My analysis is unable to disentangle the two effects. These estimates mirror findings from the minimum wage literature. For instance, Neumark and Wascher (1995a, 1995b, 2003) find that reported youth enrollment falls in response to an increase in the minimum wage.

5 Conclusion

Previous research on the labor market impact of immigration generally concludes that immigration has little displacement effect on adult natives, particularly for low-skilled adults. My paper confirms this finding, but demonstrates that focusing only on the adult labor market ignores a segment of the population — high school age youth — that experiences substantial disemployment from immigration. I estimate that a 10 percentage point increase in the share of the low skilled population that is immigrant reduces the proportion of teens employed in the Census reference week by 4.8 percentage points, and the proportion employed in the previous year by 5.3 percentage points. Given average employment rates of 32% and 47%, respectively, these effects are large.

How much of the decline in teen summer employment since the early 1990s can be explained by rising low skill immigration? To answer this question, I estimate the impact of immigration on summer youth employment using CPS data from 1979-81, 1989-91, 1999-2001, and 2004-05. A 10 percentage point increase in the low-skilled immigrant share of a state is estimated to reduce the number of teens who report being employed in the previous week (during the summer) by 6.0 percent. To estimate a counterfactual national 2005 summer employment rate for teens in the absence of changes to immigrant concentrations since 1990, I adjust each state's 2005 teen summer employment rate by the estimated immigration effect on employment multiplied by the actual change in immigrant shares over this period³³. Between 1990 and 2005, the summer employment rate fell from 43% to

³³Since only 40 MSAs are identified in earlier CPS data, I use variation in the immigrant share of a state

32%. The counterfactual employment rate in 2005 is 37%, suggesting that in the absence of immigration growth, the teen employment rate would have fallen by 6 percentage points instead of 11 percentage points. Teen summer employment rates are about 5 percentage points lower than they would be had immigrant concentrations remained unchanged since 1990, and this difference is equivalent to almost half of the actual decline in the employment rate over this period.

Much of the difference between actual and counterfactual employment rates is due to significant immigration growth between 1990 and 2000. During this period, teen employment rates remained stable despite rising adult employment rates (Figure 1), so one interpretation of this analysis is that in the absence of immigration, teen employment rates would have trended up with low-skilled adult employment rates. However, it is not accurate to claim that half of the decline in teen employment between 2000 and 2005 — the period of especially strong declining youth employment — is attributable to immigration growth. Across all states, immigrant shares increased by 2 percentage points on average between 2000 and 2005, and the number of low-skilled immigrants increased by about 20 percent on average. Combining these changes with the estimated effects of changes in immigrant shares and stocks on teen employment, immigration growth between 2000 and 2005 can explain 15-25 percent of the observed decline in teen employment in this 5-year period. Some have argued that teens have reduced their labor force participation recently because of supply-side factors such as increasing emphasis on high school and college education and growth in Hope-type scholarships (Aaronson, Park and Sullivan 2006). One implication of this view is that alternative human capital investments are replacing youth employment experience, which may result in long-run gains to these cohorts. Since immigration effects are substantial, however, demand-side factors are also significant — and the long-run implications of falling employment are less certain.

This is particularly true for black youth, youth from poorer families, and urban youth, as the employment effects of immigration relative to average employment rates are larger for

rather than an MSA. Counterfactual state employment rates in 2005 are: $emp_{s,2005} + .60 * (P_{s,2005} - P_{s,1990})$. Immigrant shares in 2005 are calculated using the 2005 American Community Survey. State counterfactual employment rates are used to estimate the counterfactual number of employed youth by state, which are aggregated to calculate the national counterfactual rate.

these populations. Ignoring the general equilibrium effects of immigration (including lower product prices due to cheaper labor), disemployment due to immigration would generally suggest that affected natives are worse off. For these less advantaged youth, however, this conclusion is less certain because poorer youth and urban teens also respond to immigration by increasing high school enrollment. Estimates of the returns to education from compulsory schooling laws suggest that, for reasonable discount rates, the monetary returns from graduating high school significantly outweigh the opportunity costs of lost wages from dropping out early (Oreopoulos 2002). Behavioral explanations such as distaste for school, uncertainty regarding individual returns to education, myopia, or peer pressure may be better explanations for dropout behavior. To the extent that these other explanations contribute to the dropout decision for at risk youth, positive enrollment effects from immigration may be welfare enhancing in the long run³⁴. The long run impact of the immigration-induced reduction in teen employment remains an open and important research question.

³⁴Fully understanding the long-run welfare implications of lower youth employment requires better knowledge of the effects of youth employment on academic performance and later life outcomes. However, there is little consensus on whether school year employment affects academic achievement or post-graduation labor market outcomes. See Tyler (2003) and DeSimone (2006) for estimates of employment effects on grades and test scores; see Ruhm (1997) and Hotz, Xu, Ienda and Ahituv (2002) for conflicting estimates of employment effects on later life labor market outcomes.

Data appendix

Data sources and variable definitions

The primary Census regression results are estimated from pooled 5 percent microdata samples for 1980, 1990, and 2000, as provided by *IPUMS* (Ruggles 2004). Estimates in Tables 9A and 9B that use indicators for whether individuals live in the center city of an MSA include the 1 percent 1990 sample (rather than 5 percent) because center city status is not reported in the 5 percent sample for 1990. Immigrants are defined as individuals who were born abroad and are either non-citizens or naturalized citizens. The adult sample is comprised of individuals 21-64. Low skill immigrant shares refer to the immigrant share of the 21-64 population without a college degree. Hourly wages in the Census are defined as annual wage income divided by the product of usual weekly hours worked and usual weeks worked in a year. Individuals are coded as having worked in the previous year if they report positive weeks worked in the previous year. Individuals are reported as having worked in the previous week if their reported employment status at the time of the Census is “at work” or “has job, not working.” School enrollment is determined from individuals’ responses to a Census question which asks whether they were enrolled in school at any time over the last two months.

Annual wage income is top coded at \$999,999. No values are top coded for teens. I multiply adult top coded values by 1.5. Given the imprecision of wage imputation, there are a number of implausible wage values for teens in particular, which arise mainly from individuals who report high annual wage incomes with few weeks or hours worked. It seems likely that these responses are significant mismeasurements of actual wages. Similarly, there are some implausibly low wage estimates due to low reported annual wages but high weeks or usual hours worked. I correct for this by assigning the 10th percentile of the wage distribution (by decade) to those youth with wages below the value, and I assign the 90th percentile to youth with wages above that amount. This seems less of a concern for adults, but given the likelihood that the wage imputation procedure results in some implausible values, I assign the 5th wage percentile to adults with wages less than that value, and the 95th percentile to adults with wages greater than that value. Wage regression results

are largely robust to these corrections, but the correction helps summary statistics for the Census sample correspond more closely to those from the CPS.

I use immigrant shares calculated in the Census as the primary regressor of interest in regressions on CPS data. Since CPS samples are much smaller in size, I pool 1979-1981, 1989-1991, 1999-2001, and 2004-05 for the CPS regression used for the counterfactual summer employment rate estimation in section 5. Immigrant shares calculated from the Census are assigned to the appropriate range of years.

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Table 1 - Low-skilled immigrant shares in select MSAs

	1980	1990	2000
	(1)	(2)	(3)
A. High Immigration MSAs			
Miami, FL	0.448	0.608	0.692
El Paso, TX	0.339	0.430	0.492
Los Angeles, CA	0.306	0.539	0.632
Jersey City, NJ	0.279	0.391	0.514
New York City, NY	0.255	0.374	0.512
Ventura-Oxnard-Simi Valley, CA	0.193	0.320	0.443
San Francisco, CA	0.189	0.473	0.584
Honolulu, HI	0.184	0.244	0.305
Bergen-Passaic, NJ	0.177	0.250	0.395
San Jose, CA	0.176	0.360	0.534
B. Low Immigration MSAs			
Mobile, AL	0.014	0.015	0.027
Indianapolis, IN	0.013	0.016	0.046
Memphis, TN	0.012	0.014	0.052
York, PA	0.012	0.021	0.034
Greensboro, NC	0.011	0.015	0.103
Louisville, KY	0.011	0.011	0.034
Nashville, TN	0.011	0.018	0.076
Chattanooga, TN	0.009	0.011	0.030
Birmingham, AL	0.009	0.010	0.032
Knoxville, TN	0.007	0.008	0.017

Notes: Calculations are estimates of the immigrant share of the adult population that has no more than a high school degree (i.e. no college experience). High and low immigration MSAs are those with the 10 highest and lowest low-skilled immigrant shares in 1980.

Table 2 - Employment shares in the five most common occupations for native teens and low-skill adult immigrants, 1980 and 2000

A. Native male teens				B. Native female teens			
1980		2000		1980		2000	
Freight, stock, and material handlers	0.204	Food prep / misc. restaurant workers	0.148	Waiter/waitresses	0.138	Cashiers	0.224
Food prep / misc. restaurant workers	0.128	Freight, stock, and material handlers	0.107	Cashiers	0.135	Salespeople	0.117
Cooks	0.087	Cooks	0.101	Salespeople	0.125	Food prep / misc. restaurant workers	0.115
Janitors	0.080	Cashiers	0.090	Food prep / misc. restaurant workers	0.106	Waiter/waitress	0.094
Farm workers	0.070	Salespeople	0.072	Child care workers	0.045	Child care workers	0.050
C. Low-skill male immigrants				D. Low-skilled female immigrants			
1980		2000		1980		2000	
Freight, stock, and material handlers	0.060	Truck, delivery, and tractor drivers	0.058	Textile sewing machine operators	0.096	Housekeepers, maids, butlers	0.089
Machine operators	0.054	Cooks	0.057	Assemblers of electrical equipment	0.053	Nursing aides, orderlies, and attendants	0.056
Misc. managers and administrators	0.044	Construction laborers	0.056	Secretaries	0.049	Cashiers	0.049
Janitors	0.041	Freight, stock, and material handlers	0.051	Salesperson	0.047	Textile sewing machine operators	0.042
Farm workers	0.040	Gardeners and groundskeepers	0.042	Machine operators	0.046	Freight, stock, and material handlers	0.042

Notes: Estimates are the share of the employed population in the given occupation. Low-skilled immigrants are non-citizens born outside of the United States who have no greater education than a high school degree. Occupation shares are calculated from Census IPUMS samples. Consistent occupation titles across years are formed using the IPUMS consistent 1990 occupational coding.

Table 3 - OLS estimates of immigration effects on native outcomes

	Employed last week	Employed last year	Annual hours
	(1)	(2)	(3)
A. Natives age 16 and 17			
Immig. share of low- skilled pop.	-0.458 (0.036)	-0.524 (0.064)	-329.2 (43.8)
N	526,151	526,151	526,151
Mean (1980)	0.320	0.469	228.7
Mean (2000)	0.309	0.437	199.6
Mean (All years)	0.317	0.466	217.7
B. Natives age 21-64 without a high school degree			
Immig. share of low- skilled pop.	-0.142 (0.044)	-0.102 (0.031)	-139.1 (74.8)
N	1,263,407	1,263,407	1,263,407
Mean (1980)	0.561	0.639	1109.1
Mean (2000)	0.498	0.612	1062.3
Mean (All years)	0.536	0.626	1078.9

Notes: Estimates are coefficients on the immigrant share of the adult population with no more than a high school degree. Standard errors clustered at the MSA level are reported in parentheses. All regressions include MSA and year fixed effects and the following individual-level controls: age, age squared, race dummies, and a dummy indicating whether the respondent is male. Regressions are weighted by the reported Census person weight. All regressions use pooled Census data from 1980, 1990, and 2000.

Table 4 - Instrumental variable components and first stage results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. Dependent Variable: Low skill immigrant stocks							
Predicted low skill immigrant stocks	0.386 (0.030)	0.652 (0.260)	0.248 (0.063)	0.395 (0.025)	0.330 (0.028)	0.351 (0.029)	0.455 (0.016)
N	300	200	200	300	300	234	300
B. Dependent Variable: Low skill native stocks							
Predicted low skill native stocks	1.278 (0.055)	1.497 (0.163)	0.749 (0.265)	1.312 (0.056)	1.202 (0.057)	1.323 (0.055)	1.278 (0.055)
N	300	200	200	300	300	234	300
C. Dependent Variable: Low skill immigrant shares							
Predicted low skill immigrant shares	0.811 (0.067)	1.174 (0.134)	0.442 (0.123)	0.760 (0.117)	0.539 (0.079)	0.818 (0.083)	0.824 (0.076)
N	300	200	200	300	300	234	300
Included years	1980-2000	1980-1990	1990-2000	1980-2000	1980-2000	1980-2000	1980-2000
Census region/year fixed effects				X			
MSA-level controls					X		
Excluding California, New York, Texas						X	
Excluding own-state inflows (see text)							X

Notes: All regressions include MSA and year fixed effects. Standard errors clustered at the MSA level are reported in parentheses. Regressions are weighted by the number of individuals age 18-64 with reported education no greater than a high school degree. MSA-level controls in column 5 include the average age of the native population, and the share of the native population that is: black, male, high school dropouts, and college graduates.

Table 5 - 2SLS estimates of immigration effects on native outcomes

	Employed last week	Employed last year	Annual hours
	(1)	(2)	(3)
A. Natives age 16 and 17			
Immig. share of low- skilled pop.	-0.482 (0.054)	-0.553 (0.096)	-287.8 (55.6)
N	526,151	526,151	526,151
Mean (1980)	0.320	0.469	228.7
Mean (2000)	0.309	0.437	199.6
Mean (All years)	0.317	0.466	217.7
B. Natives age 21-64 without a high school degree			
Immig. share of low- skilled pop.	-0.157 (0.061)	-0.124 (0.048)	-248.9 (98.7)
N	1,263,407	1,263,407	1,263,407
Mean (1980)	0.561	0.639	1109.1
Mean (2000)	0.498	0.612	1062.3
Mean (All years)	0.536	0.626	1078.9

Notes: Estimates are coefficients on the immigrant share of the adult population with no more than a high school degree. Standard errors clustered at the MSA level are reported in parentheses. All regressions include MSA and year fixed effects and the following individual-level controls: age, age squared, race dummies, and a dummy indicating whether the respondent is male. Regressions are weighted by the reported Census person weight. All regressions use pooled Census data from 1980, 1990, and 2000.

Table 6 - Robustness of the effect of immigration on teen employment, 1980-2005 (2SLS)

Dependent variable: employed last year						
	OLS	IV	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)	(5)	(6)
A. Robustness to immigrant concentration variable						
Immig. share of low-skilled pop.	-0.524 (0.064)	-0.553 (0.096)	-0.594 (0.128)	-0.978 (0.199)		
Immig. share of high-skilled pop.			0.172 (0.298)	0.915 (0.521)		
Log number of low-skilled immigrants					-0.058 (0.011)	-0.156 (0.037)
N	526,151	526,151	526,151	526,151	526,151	526,151
B. Robustness to sample selection						
Immig. share of low-skilled pop.	-0.432 (0.108)	-0.853 (0.335)	-0.428 (0.101)	-0.359 (0.108)	-0.584 (0.073)	-0.625 (0.115)
N	318,413	318,413	348,848	348,848	361,416	361,416
Excluding 1980	X	X				
Excluding 2000			X	X		
No CA., TX., NY MSAs					X	X
C. Robustness to controls						
Immig. share of low-skilled pop.	-0.472 (0.079)	-0.505 (0.158)	-0.544 (0.060)	-0.573 (0.105)	-0.223 (0.105)	-0.377 (0.239)
N	526,151	526,151	565,884	565,884	565,884	565,884
Census region/year fixed effects	X	X				
Including 2005 (ACS)			X	X	X	X
MSA specific time trends					X	X

Notes: Estimates are coefficients on the immigrant share of the adult population with no more than a high school degree. Standard errors clustered at the MSA level are reported in parentheses. All regressions include MSA and year fixed effects and the following individual-level controls: age, age squared, race dummies, and a dummy indicating whether the respondent is male. Columns 5 and 6 of Panel A also control for the log of the number of low-skilled natives. Regressions are weighted by the reported Census person weight. All regressions use pooled Census data from 1980, 1990, and 2000. Estimates in columns 3-6 of Panel C include 2005 ACS data.

Table 7 - Differential impact of immigration on occupation-level employment by communication skills required in the occupation (2SLS)

Dependent variable: log number of employed natives in occupation o		
	Native teens	Low-skilled native adults
	(1)	(2)
Low-skilled immig. share _{ct}	-0.853 (0.210)	-2.421 (0.683)
(Low-skilled immig. share) _{ct} x (job's percentile in distribution of communication skills) _o	0.953 (0.157)	1.840 (0.261)
Average communication percentile of job (all years)	0.346	0.542
N	98,700	98,700

Notes: Estimates are coefficients from occupation-MSA-year level 2SLS regressions of the log number of teens or native adults employed in occupation o on low skill immigrant shares, and immigrant shares interacted with communication percentile. The number of employed individuals in a cell is set equal to 1 if there are no observations for the particular occupation-year-city. Standard errors clustered at the MSA level are reported in parenthesis. See text for description of communication percentile. Communication percentile is measured from 0 to 1.

Table 8 - Estimated wage impact of immigration and implied employment participation elasticities

Dependent variable: log hourly wage						
	Natives age 16 and 17			Natives age 21-64 without a high school degree		
	OLS	IV	Selection-corrected	OLS	IV	Selection-corrected
	(1)	(2)	(3)	(4)	(5)	(6)
Immig. share of low-skilled pop.	-0.127 (0.052)	-0.143 (0.086)	-0.366	0.144 (0.087)	-0.062 (0.166)	-0.112
	N=238,063			N=722,357		
Implied weekly employment participation elasticity	12.0	10.6	4.2	-	4.7	2.6
Implied annual employment participation elasticity	9.5	8.4	3.3	-	3.2	1.8

Notes: Estimates in columns 1, 2, 4, and 5 are coefficients on the immigrant share of the adult population with no more than a high school degree. Selection-corrected wage estimates in columns 3 and 6 are calculated as described in the text. Standard errors clustered at the MSA level are reported in parentheses. All regressions include MSA and year fixed effects, the log of the maximum of the state and federal minimum wage, city-level controls (the average age of the native population, and the share of the native population that is: black, male, high school dropouts, and college graduates) and individual-level controls (age, age squared, race dummies, and a dummy indicating whether the respondent is male). Regressions are weighted by the reported Census person weight. All regressions use pooled Census data from 1980, 1990, and 2000.

Table 9A: 2SLS estimates of immigration effects for subsamples of the youth population

	Dependent variable: Employed last week		Dependent variable: In school	
	Males	Females	Males	Females
	(1)	(2)	(3)	(4)
A. Comparison of immigration effects for black youth and all other youth				
Low-skilled immigrant share (black youth)	-0.404 (0.077)	-0.447 (0.069)	0.028 (0.024)	0.049 (0.022)
Low-skilled immigrant share (other youth)	-0.567 (0.050)	-0.638 (0.059)	0.043 (0.021)	0.045 (0.019)
N	209,485	205,454	209,485	205,454
Mean, all years [immigration impact relative to mean]				
Black youth	0.175 [-.231]	0.182 [-.245]	0.910 [.003]	0.912 [.005]
All other youth	0.347 [-.164]	0.352 [-.181]	0.925 [.005]	0.921 [.005]
B. Comparison of immigration effects for youth from poorer families and all other youth				
Low-skilled immigrant share (youth from poorer families)	-0.415 (0.046)	-0.487 (0.063)	0.135 (0.021)	0.135 (0.019)
Low-skilled immigrant share (other youth)	-0.536 (0.046)	-0.594 (0.055)	0.035 (0.017)	0.041 (0.016)
N	198,893	191,033	198,893	191,033
Mean, all years [immigration impact relative to mean]				
Youth from poorer families	0.216 [-.192]	0.230 [-.212]	0.871 [.015]	0.886 [.015]
All other youth	0.346 [-.155]	0.353 [-.168]	0.947 [.004]	0.954 [.004]
C. Comparison of immigration effects for urban youth and all other youth				
Low-skilled immigrant share (urban youth)	-0.496 (0.059)	-0.518 (0.064)	0.072 (0.022)	0.105 (0.025)
Low-skilled immigrant share (other youth)	-0.531 (0.084)	-0.579 (0.086)	0.041 (0.026)	0.026 (0.018)
N	167,422	163,918	167,422	163,918
Mean, all years [immigration impact relative to mean]				
Urban youth	0.236 [-.211]	0.240 [-.216]	0.896 [.008]	0.892 [.012]
All other youth	0.346 [-.154]	0.353 [-.164]	0.936 [.004]	0.933 [.003]

Notes: Estimates are coefficients on the immigrant share of the low-skilled adult population interacted with dummies for various subgroups of youth. Standard errors clustered at the MSA level are reported in parentheses. The mean of the dependent variable is reported for various subgroups, and the impact of a 10 percentage point increase in the low-skilled immigrant share relative to this mean is reported in brackets. All regressions include MSA and year fixed effects and the following individual-level controls: age, age squared, race dummies, and a dummy indicating whether the respondent is male. Regressions are weighted by the reported Census person weight. All regressions use pooled Census data from 1980, 1990, and 2000. Panel B only includes individuals with at least one matched parent in the Census. Panel C uses the 1990 one percent sample in place of the five percent sample (see data appendix for details).

Table 9B: 2SLS estimates of immigration effects for subsamples of the youth population (cont.)

	Dependent variable: Employed last week		Dependent variable: In school	
	Males	Females	Males	Females
	(1)	(2)	(3)	(4)
D. Comparison of immigration effects for urban youth and all other youth, conditional on being black				
Low-skilled immigrant share (urban youth)	-0.386 (0.088)	-0.475 (0.087)	-0.013 (0.060)	0.031 (0.034)
Low-skilled immigrant share (other youth)	-0.326 (0.085)	-0.391 (0.107)	-0.019 (0.062)	0.031 (0.040)
N	30,006	30,848	30,006	30,848
Mean, all years [immigration impact relative to mean]				
Urban youth	0.152 [-.253]	0.160 [-.296]	0.902 [-.001]	0.900 [.003]
All other youth	0.195 [-.168]	0.214 [-.182]	0.932 [-.002]	0.932 [.003]
E. Comparison of immigration effects for black youth and all other youth, conditional on living in the center city of an MSA				
Low-skilled immigrant share (black youth)	-0.161 (0.145)	-0.293 (0.179)	-0.010 (0.045)	0.017 (0.042)
Low-skilled immigrant share (other youth)	-0.387 (0.107)	-0.503 (0.145)	0.097 (0.049)	0.088 (0.030)
N	53,719	54,026	53,719	54,026
Mean, all years [immigration impact relative to mean]				
Black youth	0.152 [-.106]	0.160 [-.182]	0.902 [-.001]	0.900 [.002]
All other youth	0.288 [-.135]	0.293 [-.172]	0.892 [.011]	0.887 [.010]

Notes: Estimates are coefficients on the immigrant share of the low-skilled adult population interacted with dummies for various subgroups of youth. Standard errors clustered at the MSA level are reported in parentheses. The mean of the dependent variable is reported for various subgroups, and the impact of a 10 percentage point increase in the low-skilled immigrant share relative to this mean is reported in brackets. All regressions include MSA and year fixed effects and the following individual-level controls: age, age squared, race dummies, and a dummy indicating whether the respondent is male. Regressions are weighted by the reported Census person weight. All regressions use pooled Census data from 1980, 1990, and 2000. Panels D and E use the 1990 one percent sample in place of the five percent sample (see data appendix for details).

Figure 1: Trends in annual employment/population rates by age

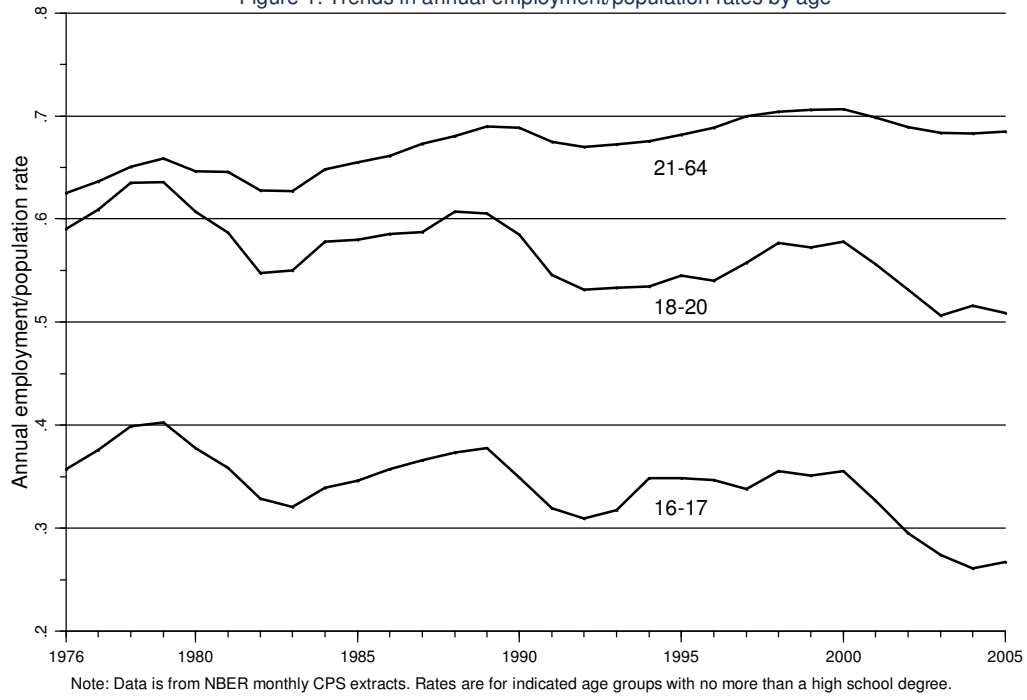


Figure 2: Trends in teen summer and school-year employment/population rates

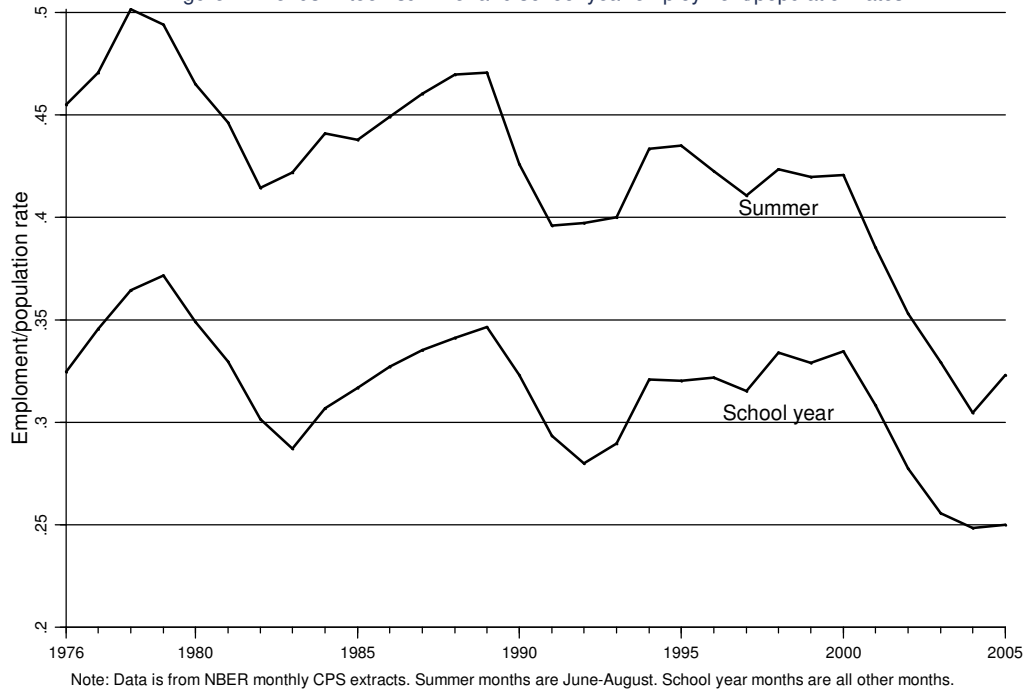
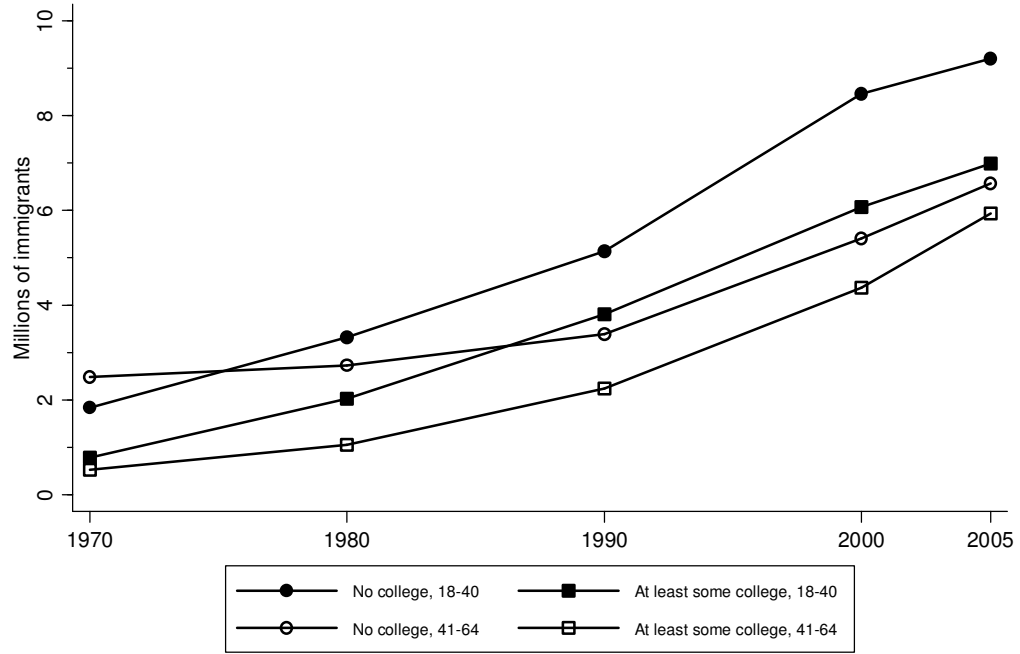
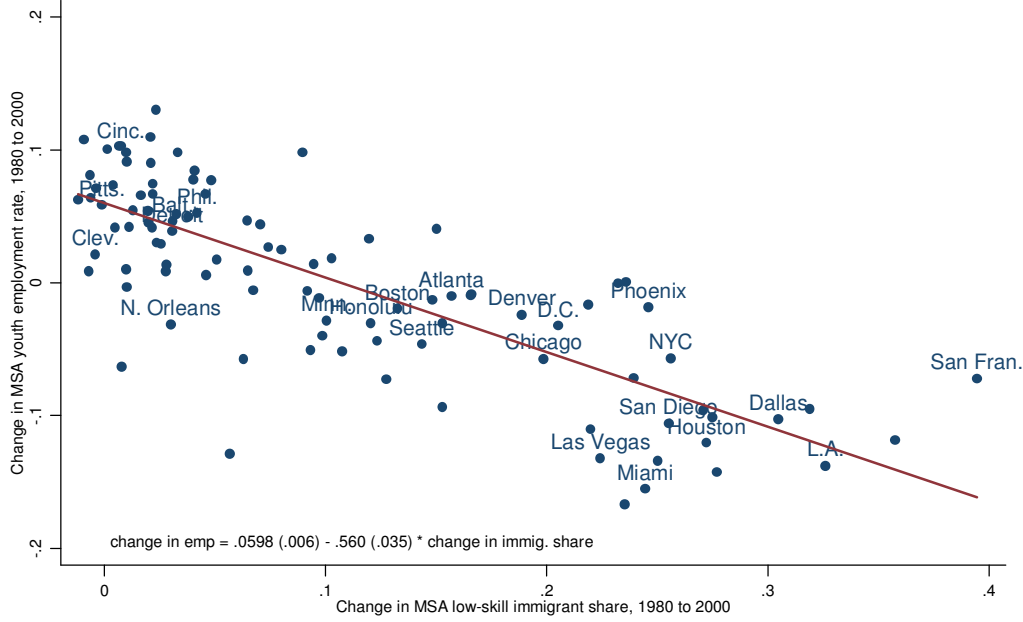


Figure 3: Trends in immigrant stocks, by age and education groups



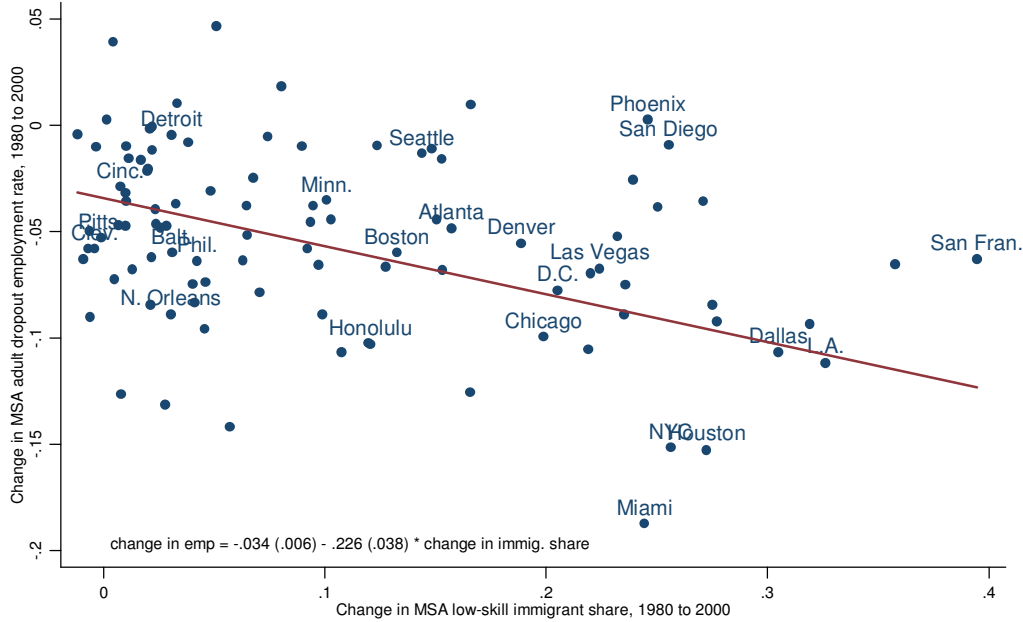
Note: 1970-2000 estimates are from Census microdata. 2005 estimate is from ACS microdata. Estimates are for all non-natives.

Figure 4A: Relationship between changes in MSA teen employment rate and low-skill immigrant shares, 1980-2000



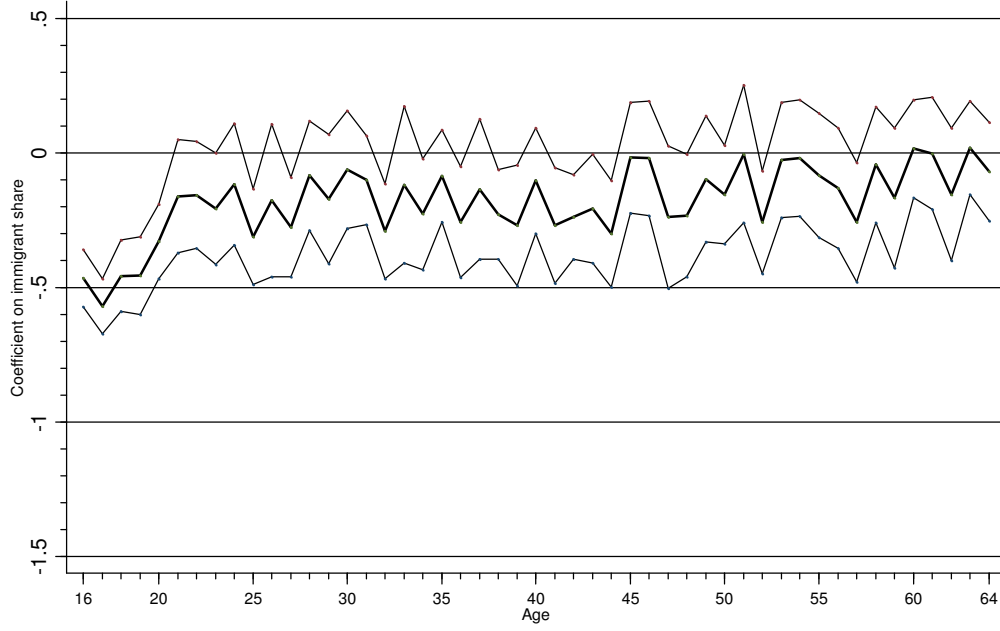
Immigrant shares are calculated over the population without college experience. Regression line is weighted by the size of the 16-17 year old MSA population in 2000.

Figure 4B: Relationship between changes in MSA adult male dropout employment rate and low-skill immigrant shares, 1980-2000



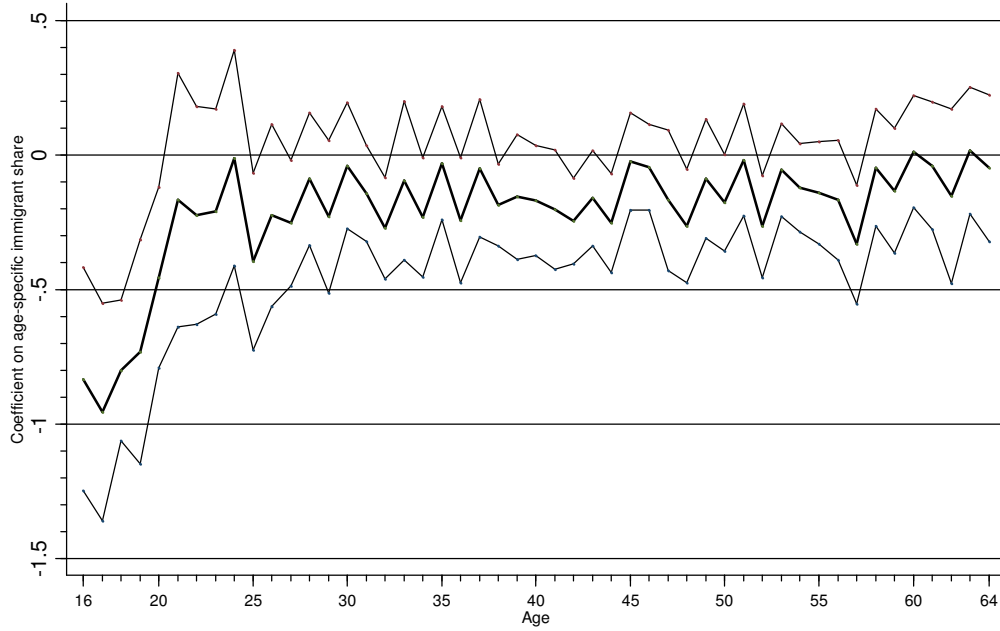
Notes: Immigrant shares are calculated over the population without college experience. Employment rates are calculated over the adult (21-64) high school dropout population. Regression line is weighted by the size of the adult dropout MSA population in 2000.

Figure 5A: Coefficient on immigrant share (IV estimates), by age
Dependent variable: employed in the last week



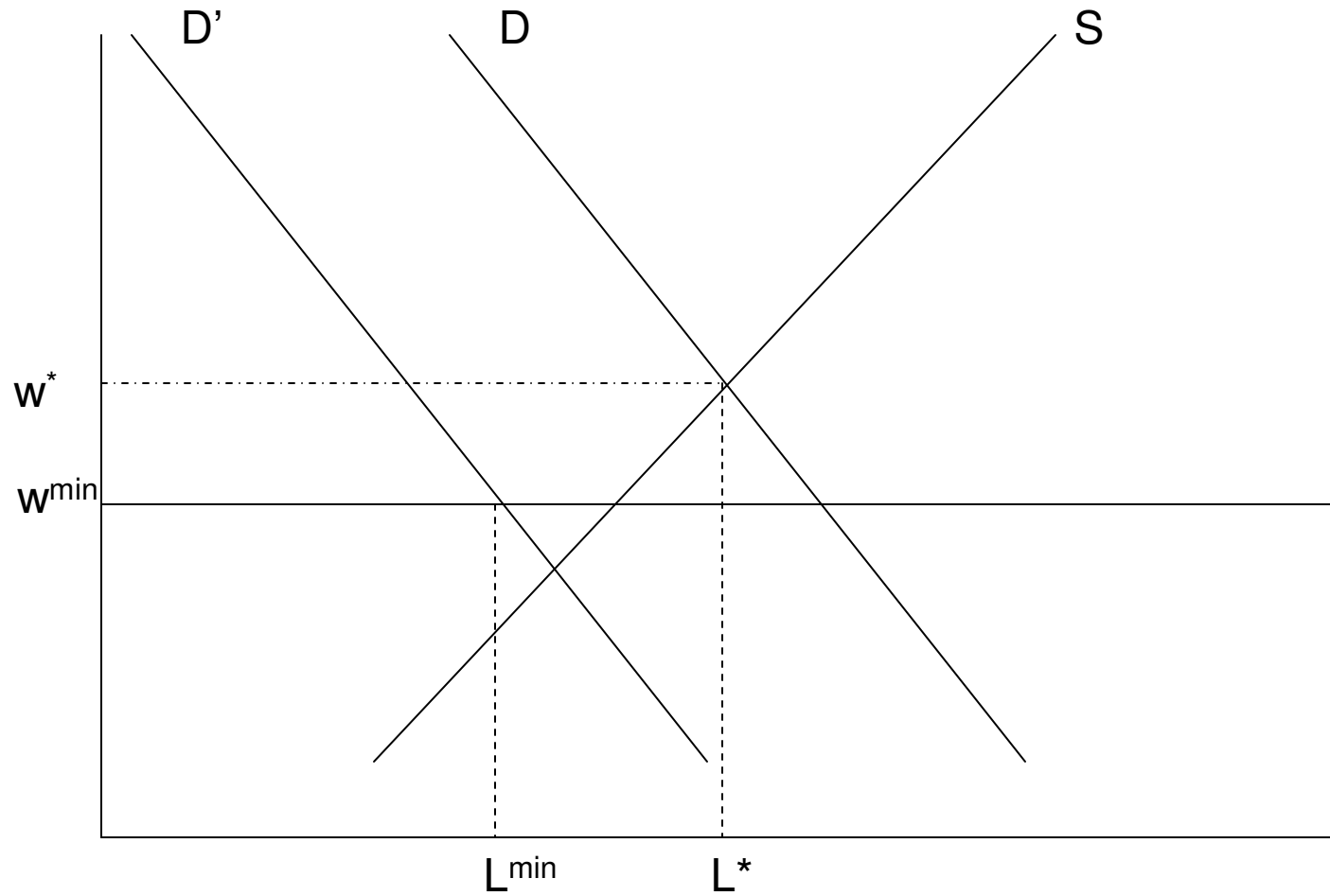
Sample limited to those without a high school degree, both sexes

Figure 5B: Coefficient on age-specific immigrant share (IV estimates), by age
Dependent variable: employed in the last week



Sample limited to those without a high school degree, both sexes

Figure 6: Immigration effects on youth wages in a labor market with a binding minimum wage



Note: In this model, immigration reduces demand for teen labor from D to D' . Teen wages fall from w^* to w^{\min} , and the number of employed teens falls from L^* to L^{\min} .

Table A1 - Means of teen labor market outcomes, Census

	Hourly wage		Employed last year		Employed last week		Fraction weeks worked		In school	
	1980	2000	1980	2000	1980	2000	1980	2000	1980	2000
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
A. All teens										
	8.61	7.74	0.47	0.44	0.31	0.31	0.20	0.20	0.89	0.94
B. Gender (natives)										
Males	8.78	7.81	0.51	0.45	0.33	0.31	0.23	0.20	0.89	0.94
Females	8.38	7.59	0.43	0.45	0.29	0.33	0.18	0.20	0.89	0.95
C. Race (natives)										
Black	8.96	7.60	0.27	0.31	0.15	0.20	0.09	0.12	0.89	0.94
Non-black	8.58	7.75	0.50	0.46	0.34	0.33	0.22	0.21	0.89	0.94
D. Parental education (natives)										
At least one parent does not have a HS degree	8.57	7.57	0.39	0.34	0.26	0.25	0.16	0.15	0.86	0.90
At least one parent has a HS degree	8.63	7.73	0.52	0.47	0.35	0.33	0.23	0.21	0.95	0.97
E. Family income (natives)										
Family is below the 25 th percentile of the income distribution	8.39	7.41	0.36	0.34	0.23	0.24	0.14	0.14	0.84	0.92
Family is above the 25 th percentile of the income distribution	8.67	7.78	0.50	0.48	0.34	0.34	0.22	0.21	0.94	0.97

Notes: Hourly wages are calculated only over those who report positive wages. All other variables are calculated over the entire given subpopulation. Estimates are averages weighted by Census person weights. Wages are reported in 2006 dollars. See data appendix for a description of how hourly wages are calculated.