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Illegal Immigration, Wage Volatility and NAFTA

Susan Pozo¹

I. NAFTA and Illegal Immigration

Much concern has been expressed about the effects of the North American Free Trade Agreement (NAFTA) on the North American economies. In particular, discussion has ensued about the effects NAFTA may have on relative wages, employment, capital flows and the environment.² This paper examines one particular aspect that has received relatively little attention in this debate—the effect of NAFTA on illegal immigration.

Perhaps the illegal immigration issue has received relatively less attention because most analysts predicted that NAFTA would result in a reduction in illegal immigration.³ If NAFTA has the effect of reducing wage disparities between the U.S. and Mexico, it follows that the levels of illegal immigration from Mexico to the U.S. would fall. Since Mexico is presumed to be the largest source of illegal immigrants, NAFTA would contribute to reducing the perceived illegal immigration problem.

NAFTA is projected to decrease wage differences by providing a larger market for Mexican exports and by reallocating Mexican resources in a more efficient manner. The increases in Mexican wages that arise from the rising productivity of Mexican workers in Mexico reduce the incentive to migrate to the United States.

Buttressing this argument is the belief that reduced investment barriers coupled with traditionally lower wages in Mexico will cause international industry relocations, moving jobs to Mexico from the United States and Canada. This raises demand for Mexican workers, while lowering demand for workers in the two northern countries. The demand shifts should shrink the wage gap and reduce incentives to migrate from Mexico to the U.S.

One could, alternatively, argue that NAFTA will increase illegal immigration. Reductions in trade restrictions could cause less border monitoring and more successful illegal border crossings. Increased flows of goods crossing the borders will also provide for greater camouflage opportunities for illegal border crossers.

One could also suggest that increased openness to international financial and trade flows may result in higher levels of immigration from Mexico. With less insulation from

1. Susan Pozo is a Professor of Economics at Western Michigan University, Kalamazoo, Michigan.
 2. See Linda Aguilar, *NAFTA: A Review of the Issues*, 17 Federal Reserve Bank of Chicago Economic Perspectives 12 (Jan./Feb. 1993); Christopher J. Martin, *The NAFTA Debate: Are Concerns about U.S. Job Migration to Mexico Legitimate?* 19 EMPLOYEE RELATIONS L. J. 239 (Winter 1993-94).
 3. See Adams, F. Gerard, Mario Alanis, & Abel Beltran del Rio, *Mexico-United States Free Trade and Investment Area Proposal: A Macroeconometric Evaluation of Impacts on Mexico*, 14 JOURNAL OF POLICY MODELING, 99 (1992); Gary A. Knight, *NAFTA Holds Promise for Stronger, Prosperous North America*, 27 Marketing News, Oct. 25, 1993, at 14. Nora Lustig, *NAFTA: Doing Well by Doing Good*, WORLD WATCH, 47 (Winter 1994).
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international events, the relatively small Mexican economy may be subject to greater international shocks. A less stable macroeconomy may, in turn, prompt more immigration to the United States. With strict limits on levels of legal immigration, an increase in illegal immigration could be the result of this scenario.

II. *Illegal Immigration Into the United States*

How much of a problem is illegal immigration in the United States? Some argue that illegal immigration is quite pervasive and present as evidence the growing number of apprehensions of illegal immigrants each year by the U.S. Immigration and Naturalization Service (INS). Table 1 presents this data since 1970 and suggests that apprehensions in 1993 were almost 4 times greater than in 1970.

Proponents of the view that illegal immigration is very large argue that INS apprehensions are only the "tip of the iceberg" and suggest that for each illegal immigrant apprehended, countless more are not detected. Others point out, however, that most apprehensions are at the U.S.- Mexican border. Many crossings at this border are undertaken by "commuters" who cross the border several times a year, or month, or daily. Hence, it is conceivable that the same individuals are apprehended again and again. The number of border crossings and the number of apprehensions is not necessarily a good figure to use when estimating the illegal alien population at any one time. The flow of illegal aliens crossing the border does not necessarily represent the stock of illegal workers in the U.S.

What then is the stock of the undocumented population? One figure that has been widely quoted states the population of illegal aliens to be in the range of 4-12 million.⁴ The upper end of this range is thought to be unrealistically high by most immigration scholars. But on what basis is this judgement made? How does one get an estimate of an activity that is illegal and therefore undertaken in a clandestine manner?

When more analytical methods are used, such as those by Jeffrey Passel, a range of 2.5-3.5 million (for 1980) seems more plausible.⁵ Of these, approximately 2 million are thought to be Mexican. Half of all undocumented workers appear to reside in California. Passel's method of estimating illegal immigration begins by determining the number of undocumented immigrants counted in the 1980 census. He then estimates to what extent the illegal population was undercounted in this census to derive an estimate of the total (counted plus not counted) illegal immigrant population.⁶

Bean, King and Passel employ alternative methods to estimate the undocumented Mexican population by comparing the male/female sex ratios of Mexicans over time.⁷ They

4. This number is commonly referred to as the number cited in "The Chapman Report." General Leonard F. Chapman Jr. was commissioner of the INS at the time.
5. Jeffrey S. Passel, "Undocumented Immigrants: How Many?" (August 1985) (paper presented at the Annual Meetings of the American Statistical Association Meeting, Las Vegas, Nevada).
6. This methodology cannot be used for the 1990 census because the Alien Registration Form is no longer required of legal aliens on an annual basis. The information from this form was used in the derivation of the 1980 estimates. Without this, Passel's methodology can no longer be applied.
7. Frank D. Bean, Allan G. King & Jeffrey S. Passel, *The Number of Illegal Migrants of Mexican Origin in the United States: Sex Ratio Based Estimates for 1980*, 20 DEMOGRAPHY, 99 (1983).

derive an estimate of 1.5 to 4 million illegal Mexican immigrants residing in the U.S. in 1980.

It is important to recall that years of debate about the illegal immigration problem in the U.S. resulted in the passage of the Immigration Reform and Control Act of 1986 (IRCA). This piece of legislation is noteworthy for providing a one time amnesty to illegal aliens and for imposing sanctions on employers who knowingly hire illegal aliens. Individuals who had immigrated illegally to the United States and were able to document certain details about their history in the United States were able to apply for legal residency status. Hence, the numbers of illegal aliens in the pre-1986 period does not necessarily play any bearing to the number of illegal aliens resident today as that stock was diminished by the amnesty program. Further, with the threat of penalties assessed on firms who knowingly employ illegal immigrants, it is conceivable that the pull by U.S. employers was effectively reduced by the legislation.⁸

More recent estimates of the stock of illegal immigrants into the United States have been undertaken. Woodrow and Passel, for example, estimate that in 1988 the stock of illegal immigrants in the United States was between 1.1 and 1.9 million.⁹ The INS estimated a slightly wider range (1.7 to 2.9 million) at the start of 1989 and an estimate of 3.2 million in 1992.¹⁰

III. Geographic Distribution of Illegal Immigrants in the U.S.

There is considerable uncertainty about the size of the illegal immigrant population in the United States, but of equal importance is the geographic distribution of illegal immigrants. Recent concerns about the "unfair burdens" that certain states are subject to on account of the uneven distribution of illegal immigrants have been voiced. The provisions of certain services to illegal immigrants does not match the revenues collected from illegal immigrants. Though there is evidence that illegal immigrants pay more than they consume in public services,¹¹ the Federal government collects a disproportionate amount of the tax revenues from illegal immigrants (through withholding and social security taxes) while immigrants consume a disproportionate amount of local services (mainly in the areas of health and education).¹² Hence, there has been considerable interest in determining the

8. Up to 1986 it was not illegal for a U.S. firm to employ an illegal immigrant. What was illegal was to harbor or aid in transporting an illegal immigrant into the United States.
9. Karen A. Woodrow & Jeffrey S. Passel, *Post-IRCA Undocumented Immigration to the United States: An Assessment Based on the June 1988 CPS*, in *UNDOCUMENTED MIGRATION TO THE UNITED STATES: IRCA AND THE EXPERIENCE OF THE 1980s*, 33 (Frank D. Bean, Barry Edmonston, & Jeffrey S. Passel, eds., 1990).
10. U.S. IMMIGRATION AND NATURALIZATION SERVICE, U.S. DEPARTMENT OF JUSTICE, *ESTIMATE OF THE RESIDENT ALIEN POPULATION: OCTOBER 1992*, (September 1993); U.S. IMMIGRATION AND NATURALIZATION SERVICE, U.S. DEPARTMENT OF JUSTICE, *International Migration to the United States*, in *THE PRESIDENT'S COMPREHENSIVE TRIENNIAL REPORT ON IMMIGRATION 1* (1989).
11. Julian Simon, *THE ECONOMIC CONSEQUENCES OF IMMIGRATION*, (1989).
12. Franc Sharry, *Myths, Realities and Solutions*, *SPECTRUM*, 20 (Winter 1994).

geographic distribution of illegal immigrants as individual states attempt to obtain Federal revenues to defray the costs of services provided to illegal immigrants.

As in the case of determining the stock of illegal immigrants, obtaining information about the spatial distribution of illegal immigrants is challenging. Nonetheless, one interesting study by Passel and Woodrow purports to pinpoint the geographic dispersion of undocumented immigrants at one point in time.¹³ These are displayed in Table 2 for each of the 50 states and the District of Columbia.¹⁴ These numbers represent the number of illegal alien residents counted in the 1980 census. To get as accurate a count as possible of the resident (legal and illegal) population of the United States, special efforts were made to gather information on undocumented residents since illegal immigrants were the most likely to escape the census counters. Consequently, the 1980 census contains valuable information on the illegal alien population.

Passel and Woodrow obtained their estimates by comparing the foreign born non-citizen population counted in the census to Alien Registration data collected by the INS during January 1980. In general, from the Alien Registration data one obtains an enumeration of the total legal alien population in the state. By subtracting that number from the number of non-citizen foreign born, one derives a lower bound figure for the undocumented immigrants who were counted in the census.¹⁵

Column (2) gives figures on the share of illegal aliens by state. California, by far has the biggest proportion of the illegal alien population—nearly 50%. New York and Texas are second and third in share of illegal aliens accounting for 11 and 9 percent respectively. Illinois has 6.5 percent of the undocumented residents counted in the census.

California then is the state with the greatest number of illegal immigrants as documented by the census. But California is also the state with the largest population. According to the 1980 census, California had a population in excess of 23.6 million persons. The second most populous state was New York with 17.5 million inhabitants. With California experiencing the greatest share of illegal immigrants, is it also the “hardest hit” (as Californians are apt to charge) by illegal immigration? What is the incidence of illegal residency? Relative to the total population, how many illegal immigrants do each of the states possess?

The total illegal alien population (column (1)) was divided by the state population figures (Column (4)) to derive the percent of state residents who are illegal residents. These figures are displayed in column (5). California continues on top, appearing to be the state with highest incidence of illegal residency (4.3 illegal residents per 100 population). The District of Columbia is in second place with 2.19 persons out of 100 being undocumented aliens. New York is third with 1.3 illegal aliens per 100 population.

13. Jeffrey S. Passel & Karen A. Woodrow, *Geographic Distribution of Undocumented Immigrants: Estimates of Undocumented Aliens Counted in the 1980 Census by State*, 18 INTERNATIONAL MIGRATION REVIEW, 642 (Fall 1984).
14. Since Passel and Woodrow (*id.*) computed their data according to state and the District of Columbia, we also make this designation. In the interest of brevity we refer to the District of Columbia as a state.
15. They made several other adjustment to make the comparison appropriate. For example, since the Alien Registration Survey was conducted in January and the Census on April 1, adjustments were made to account for legal immigration from January to April, 1980.

What these figures show is that the geographic incidence of illegal residency is spread more evenly once population has been taken into account. Though there are substantial variations in the total number of illegal residents residing in each state, the census suggests that there is less than 1 percent illegal population in all but six states (including the District of Columbia). Nonetheless, there remain variations in illegal residency and we exploit these variations to learn how illegal immigrants affect certain labor market conditions.

IV. Illegal Immigration and Wage Volatility

Much work has been undertaken estimating the effects of illegal immigration on the level of wages. In essence, researchers have tried to get at the issue of whether illegal immigration affects the job prospects of legal and domestic workers. Do illegal immigrants compete for the same jobs and hence reduce wages for domestic workers? Are illegal immigrants substitutes for domestic workers? Or do illegal immigrants take only jobs that legal workers do not? Are illegal immigrants complements in production with legal workers raising the output of domestic workers as increases in complementary inputs would tend to do?

In this paper, these issues are not addressed. Instead we ask, what do immigrants do to the volatility of wages? Do immigrants cause wage rates to become more unstable over time or do immigrants tend to smooth out the wages of domestic workers? Does increased immigration increase the volatility or reduce the volatility of wages over time?

It is always challenging to obtain the requisite information to test a proposition involving illegal goods or services. The illegal labor market is no exception. The methodology we will use to test the effect of illegal immigrants on wage volatility is similar to the approach that has been employed to test for the effect of total immigrants on the level of wages for native-born workers.¹⁶ When testing whether immigrants reduce the wages of native workers, researchers often compare wage rates for native workers in Standard Metropolitan Statistical Areas (SMSAs) that contain many immigrants with wage rates of native workers in SMSAs in which few immigrants reside. Here we propose to use a parallel technique by examining how the time series of wages behaves in states that have a large proportion of illegal workers to states that have a low proportion of illegal workers.

A. HIGH AND LOW DENSITY ILLEGAL IMMIGRANT STATES

In Table 3, the 50 states and the District of Columbia are rank-ordered according to the percent of state population found to be undocumented. That is, by using the "percent state illegal" figures derived in column (5) of Table 2, we rank and order the states from most heavily populated with illegal immigrants per capita (California with 430 illegal immigrants per 10,000 population) to the state with the smallest number of illegal immigrants per capita (West Virginia with 5 illegal immigrants per 10,000 population).

Using the rank orderings of Table 3, we classify some states as high-density illegal immigrant states and other states as low-density illegal immigrant states. We use this classification to investigate whether wage volatility is associated with the density of illegal immi-

16. GEORGE BORJAS, *FRIENDS AND STRANGERS: THE IMPACT OF IMMIGRANTS ON THE U.S. ECONOMY*, (1990); Kristin F. Butcher & David Card, *Immigration and Wages: Evidence from the 1980's*, 81 *AMERICAN ECONOMIC REVIEW*, 292 (May 1991).

grants. We include in our final sample the top five high-density illegal immigrant states (California, Washington D.C., New York, Texas and Illinois) and the top six low-density illegal immigrant states (Iowa, South Dakota, Montana, Pennsylvania, New Hampshire, and West Virginia).¹⁷

B. THE WAGE SERIES

We use hourly earnings of nonsupervisory workers in manufacturing to test the hypothesis regarding the effects of illegal immigration on wage volatility. Manufacturing hourly earnings were obtained from EMPLOYMENT, HOURS, AND EARNINGS, STATES AND AREAS, 1972-87.¹⁸ The earnings series exists for almost all the states designated as having the highest and lowest illegal immigrants per capita. The series is monthly and our sample spans from 1976 to 1987.¹⁹

C. SUMMARY DESCRIPTIVE STATISTICS

Summary descriptive statistics for the individual high- and low-density states and their averages are displayed in Tables 4 and 5. It is interesting to note that on average wages are higher in the high-density illegal immigrant states. The high density states experienced, on average, an additional 29 cents per hour in wages (\$8.28 versus \$7.99).²⁰

With respect to dispersion in the wage series over time (as opposed to over states), a summary measure of volatility was derived—0.00962 for the high density states and 0.0154 for the low density states. These were obtained as follows. For each state, month-to-month percentage changes in the wage series was computed. The standard deviation of each individual state series was computed and these are displayed in the column labelled, STANDARD DEVIATION OF WAGE. The average standard deviation for the high density and low density states was then computed and these are reported on the line below the table labelled AVERAGE HIGH-DENSITY and AVERAGE LOW-DENSITY. The low illegal immigrant states experience larger volatility in the wage series. There is more variation, over time in states that have fewer illegal immigrants. The average standard deviation of percentage changes in wages is 0.0154 in the low illegal immigrant states, while it is 0.0096 in the high illegal immigrant states.²¹

17. We include 6 low-density states because Iowa and South Dakota tied for 5th lowest density states.
18. U.S. DEPARTMENT OF LABOR, EMPLOYMENT, HOURS, AND EARNINGS, STATES AND AREAS, 1972-87, Establishment Survey Data, Bulletin 2320 (March 1989).
19. We use data from 1976 because for two of the states in our sample (Iowa and Texas) the series begins in 1976. To get series that are comparable across all states we are therefore constrained to begin our sample with 1976.
20. The standard error of the difference in means for this group of data is 0.19. Hence the difference in means is significantly different from 0 at the 10-percent level of significance (but not at the 5-percent level).
21. Rejection of the null hypothesis of equality of variances occurs when the F-ratio (s_L^2/s_H^2) exceeds 1.3. For these series the F-ratio is 2.57 ($0.0154^2/0.0096^2$), hence we are able to claim at the 5-percent level of significance that the variances differ.

D. TIME SERIES MEASURES OF VOLATILITY

The summary descriptive statistics displayed in Tables 4 and 5 support the proposition that wage volatility is different in the two categories of states. We obtained these results by devising a volatility measure that is an average or aggregate of volatility over an extended period of time. However, if outliers in volatility exist, or if the level of volatility is time-dependent, then we may be masking important patterns in volatility by using the standard deviation over the full period.

To examine the pattern of volatility over time, we plot the differences in wage volatility each period in the high illegal immigrant states and low illegal immigrant states using 12-month rolling standard deviations. This is displayed in Figure 1. Inspection of Figure 1 suggests that it is more common for the volatility in wages of workers in high density illegal immigrant states to be *less* than that experienced in low-density illegal immigrant states. But whether this can be confirmed statistically is another matter.

In order to statistically conclude whether we observe differences in volatility in the time series data, a nonparametric test, the one sample sign test, is performed on the series displayed in Figure 1. We test the hypothesis that:

$$H_0: d \text{ equals } 0$$

against the alternative that

$$H_1: d \text{ is not equal to } 0$$

where

$$d = rs_{HD} - rs_{LD}$$

We let rs_{HD} represent the 12-month rolling standard deviation for the high-density states and rs_{LD} is the 12-month rolling standard deviation for the low-density states.

For the sign test, we ignore the magnitude of the differences and simply record whether the difference is positive, negative or zero. When the number of pluses (or minuses) is very large or very small, we reject the null hypothesis that the volatilities are equal to each other.

The probability that we observe 53 or fewer pluses out of a total of 131 differences when the true difference was zero, is only 0.02. Hence, using conventional levels of significance, we have statistical support for the proposition of greater manufacturing wage volatility in low illegal immigrant states.

E. STATISTICAL CONCLUSIONS

What can we conclude from these results? We set out to test the hypothesis that the volatility of wages is affected by the level of illegal immigration. We find that in the case of manufacturing workers, dispersion in the time series of wages is greater in markets that tend to have fewer illegal immigrants. Wages tend to be more stable in the labor markets that contain higher proportions of illegal immigrants.

This result was obtained by comparing patterns in the manufacturing wages, from 1976 through 1987, for two categories of states—states with the largest proportions of illegal immigrants and states with the lowest proportions of illegal immigrants. Even though we do not directly observe illegal immigrants, we assumed that the *rank orderings* of states in terms of the probability that a worker is an illegal immigrant, remained equal to what was observed from studies of the illegal immigrant population in 1980.

The relative volatility results obtained for the state wage series are consistent with the

following scenario. Illegal workers cluster in certain areas. These are likely the areas where other immigrants (legal and illegal) tend to reside. Illegal immigrants gravitate to these areas to take advantage of the information networks that have been laid down by other immigrant acquaintances and family. They find that the transactions costs of moving to areas not inhabited by immigrants is large in terms of gathering information to avoid detection, finding housing, finding suitable employment and so forth. Hence, in the areas where illegal immigrants tend to reside, we observe a *relatively* elastic supply of labor. This may account for the relative stability in wage time-series observed in high-density illegal immigrant states.

V. Conclusions

In order to begin discerning what impact NAFTA may have on the volatility of wages, two separate questions need to be answered. First, one needs to ascertain what affect NAFTA will have on illegal immigration. Second, we need to determine what illegal immigration does to volatility in the time series of wages.

In this paper we addressed the second question by attempting to statistically discern the effect of illegal immigration on the manufacturing wage series. We compare states with high proportions of illegal immigrants to states with low proportions of illegal immigrants and find that states with lower proportions of illegal immigrants are associated with higher wage volatility. The time series of wages in states with proportionately more illegal immigrants displays more stability. Hence, if NAFTA is successful in reducing the flow and eventual stock of illegal immigrants, we may find that wages in the U.S. become more volatile.

In order to accurately answer the question, what affect will NAFTA have on wage volatility, we still need to determine the effect of NAFTA on illegal immigration. Most writers on this issue suggest that NAFTA will reduce the volume of illegal Mexican immigration into the United States. However, this conclusion is not backed by empirical evidence and arguments to the contrary can be made: illegal immigration may increase as a result of NAFTA. Additional research needs to be conducted in this area to more firmly establish the effect of NAFTA on the stock of illegal immigrants in the United States.

In conclusion, if we accept the conventional wisdom that NAFTA will eventually result in a reduction in illegal immigration from Mexico, this work suggests that we should expect to see increases in wage series volatility in the United States.

Table 1
Apprehensions of Illegal Aliens

Year	Number of Apprehensions	Year	Number of Apprehensions
1970	345,353	1982	970,246
1971	420,126	1983	1,215,357
1972	505,949	1984	1,246,981
1973	655,968	1985	1,348,749
1974	788,145	1986	1,767,400
1975	766,600	1987	1,190,488
1976	875,915	1988	1,008,145
1977	1,042,215	1989	954,243
1978	1,057,977	1990	1,169,939
1979	1,076,418	1991	1,197,875
1980	910,418	1992	1,258,482
1981	975,780	1993	1,327,259

Source: U.S. IMMIGRATION AND NATURALIZATION SERVICE, STATISTICAL YEARBOOK OF THE IMMIGRATION AND NATURALIZATION SERVICE, 1993, (1994), Table 59.

Table 2
Population of Legal and Illegal Immigrants by State of Residence in 1980

State	(1) Illegal Aliens	(2) Percent of Total Illegal Aliens	(3) Legal Aliens	(4) State Population	(5) Percent State Illegal
Alabama	5,000	0.24	11,000	3,894,000	0.13
Alaska	1,000	0.05	6,000	402,000	0.25
Arizona	25,000	1.22	75,000	2,718,000	0.92
Arkansas	3,000	0.15	6,000	2,286,000	0.13
California	1,024,000	49.81	1,520,000	23,668,000	4.33
Colorado	19,000	0.92	38,000	2,890,000	0.66
Connecticut	4,000	0.19	90,000	3,108,000	0.13
Delaware	1,000	0.05	6,000	594,000	0.17
D.C.	14,000	0.68	11,000	638,000	2.19
Florida	80,000	3.89	427,000	9,746,000	0.82
Georgia	12,000	0.58	30,000	5,463,000	0.22
Hawaii	1,000	0.05	69,000	965,000	0.10
Idaho	5,000	0.24	7,000	944,000	0.53
Illinois	135,000	6.57	306,000	11,427,000	1.18

Table 2 (continued)

State	(1) Illegal Aliens	(2) Percent of Total Illegal Aliens	(3) Legal Aliens	(4) State Population	(5) Percent State Illegal
Indiana	8,000	0.39	33,000	5,490,000	0.15
Iowa	2,000	0.10	17,000	2,914,000	0.07
Kansas	8,000	0.39	19,000	2,364,000	0.34
Kentucky	4,000	0.19	11,000	3,661,000	0.11
Louisiana	7,000	0.34	39,000	4,206,000	0.17
Maine	1,000	0.05	10,000	1,125,000	0.09
Maryland	32,000	1.56	66,000	4,217,000	0.76
Massachusetts	17,000	0.83	174,000	5,737,000	0.30
Michigan	8,000	0.39	123,000	9,262,000	0.09
Minnesota	9,000	0.44	32,000	4,076,000	0.22
Mississippi	4,000	0.19	6,000	2,521,000	0.16
Missouri	7,000	0.34	25,000	4,917,000	0.14
Montana	(z)	—	4,000	787,000	—
Nebraska	3,000	0.15	8,000	1,570,000	0.19
Nevada	7,000	0.34	23,000	800,000	0.88
New Hampshire	(z)	—	10,000	921,000	—
New Jersey	37,000	1.80	281,000	7,365,000	0.50
New Mexico	13,000	0.63	22,000	1,303,000	1.00
New York	234,000	11.38	832,000	17,558,000	1.33
North Carolina	9,000	0.44	26,000	5,882,000	0.15
North Dakota	1,000	0.05	3,000	653,000	0.15
Ohio	10,000	0.49	76,000	10,798,000	0.09
Oklahoma	11,000	0.55	22,000	3,025,000	0.36
Oregon	15,000	0.73	35,000	2,633,000	0.57
Pennsylvania	7,000	0.34	107,000	11,864,000	0.06
Rhode Island	2,000	0.10	35,000	947,000	0.21
South Carolina	4,000	0.19	15,000	3,122,000	0.13
South Dakota	(z)	—	2,000	691,000	—
Tennessee	6,000	0.29	16,000	4,591,000	0.13
Texas	186,000	9.05	505,000	14,229,000	1.31
Utah	9,000	0.44	16,000	1,461,000	0.62
Vermont	(z)	—	5,000	511,000	—
Virginia	34,000	1.65	62,000	5,347,000	0.64
Washington	22,000	1.07	80,000	4,132,000	0.53
West Virginia	1,000	0.05	6,000	1,950,000	0.05
Wisconsin	8,000	0.39	30,000	4,706,000	0.17
Wyoming	1,000	0.05	3,000	470,000	0.21

Table Notes and Sources: (z) rounds to 0, — signifies not available or not applicable. Column (1) figures are from Passel and Woodrow's estimates of the total illegal alien population in that state counted in the 1980 census, Jeffrey S. Passel & Karen A. Woodrow, *Geographic Distribution of Undocumented Immigrants: Estimates of Undocumented Aliens Counted in the 1980 Census by State*, 18 INTERNATIONAL MIGRATION REVIEW, 642, Table 2. Column (2) was derived by the author by dividing the illegal alien population of that state (column (1)) by the total illegal alien population counted in the census (2,056,000). Column (3) is the total legal alien population as computed by Passel and Woodrow, supra, at Table 2. Column (4) is the total state population as derived from the 1980 census and reported in U.S. DEPARTMENT OF COMMERCE, STATISTICAL ABSTRACT OF THE UNITED STATES, (1988) at Table No. 21. Column (5) is the percent of the state population that is illegal, derived by the author by dividing column (1) by column (4). See text for details.

Table 3**Rank Ordering of States by Proportion of Population Estimated to be Illegal Aliens by the 1980 Census**

1. California	4.33	35. Connecticut	0.13
2. District of Columbia	2.19	35. Alabama	0.13
3. New York	1.33	35. Arkansas	0.13
4. Texas	1.31	40. Kentucky	0.11
5. Illinois	1.18	41. Hawaii	0.10
6. New Mexico	1.00	42. Maine	0.09
7. Arizona	0.92	42. Michigan	0.09
8. Nevada	0.88	42. Ohio	0.09
9. Florida	0.82	42. Vermont	0.09
10. Maryland	0.76	46. Iowa	0.07
11. Colorado	0.66	47. South Dakota	0.07
12. Virginia	0.64	48. Montana	0.06
13. Utah	0.62	48. Pennsylvania	0.06
14. Oregon	0.57	50. New Hampshire	0.05
15. Idaho	0.53	50. West Virginia	0.05
15. Washington	0.53		
17. New Jersey	0.50		
18. Oklahoma	0.36		
19. Kansas	0.34		
20. Massachusetts	0.30		
21. Alaska	0.25		
22. Minnesota	0.22		
23. Georgia	0.22		
23. Rhode Island	0.21		
23. Wyoming	0.21		
26. Nebraska	0.19		
27. Delaware	0.17		
27. Louisiana	0.17		
27. Wisconsin	0.17		
30. Mississippi	0.16		
31. North Carolina	0.15		
31. North Dakota	0.15		
31. Indiana	0.15		
34. Missouri	0.14		
35. South Carolina	0.13		
35. Tennessee	0.13		

Notes: Rank orderings are computed by the author from the information contained in Table 3. For Montana, New Hampshire, South Dakota, and Vermont, the proportion illegal is an upperbound estimate. It was constructed by assuming that as many as 500 illegal aliens were counted in that state for the 1980 census. The data source lists the number of illegal immigrants counted as less than 500.

Table 4**Descriptive Statistics for Manufacturing Wages of Workers in High-Density Illegal Immigrant States (1976 through 1987)**

High-Density States	Density	Mean Wage	Standard Deviation of Wage
California	4.33	8.42	0.0056
D.C.	2.19	8.62	0.0224
New York	1.33	7.89	0.0065
Texas	1.31	7.77	0.0076
Illinois	1.18	8.67	0.0060
AVERAGE HIGH-DENSITY	2.07	8.28	0.0096

Source: The manufacturing wage series was obtained from U.S. DEPARTMENT OF LABOR, EMPLOYMENT, HOURS, AND EARNINGS, STATES AND AREAS, 1972-87, Establishment Survey Data, Bulletin 2320 (March 1989). The column labelled DENSITY gives the percent of the population in that state that is an illegal immigrant. The column labelled MEAN WAGE gives average of all the monthly wages from 1972-87. (1989). The column labelled STANDARD DEVIATION WAGE is the standard deviation of percentage changes in the monthly wage over the entire period. AVERAGE HIGH-DENSITY represents unweighted average density, wages, and standard deviation for the 5-high density states listed in the table. See text for details.

Table 5**Descriptive Statistics for Manufacturing Wages of Workers in Low-Density Illegal Immigrant States (1976 through 1987)**

Low-Density States	Density	Mean Wage	Standard Deviation of Wage
Iowa	0.07	8.90	0.0241
South Dakota	0.07	6.56	0.0172
Montana	0.06	9.18	0.0218
Pennsylvania	0.06	8.05	0.0057
New Hampshire	0.05	6.67	0.0073
West Virginia	0.05	8.56	0.0164
AVERAGE LOW-DENSITY	0.06	7.99	0.0154

Source: The manufacturing wage series was obtained from U.S. DEPARTMENT OF LABOR, EMPLOYMENT, HOURS, AND EARNINGS, STATES AND AREAS, 1972-87, Establishment Survey Data, Bulletin 2320 (March 1989). The column labelled DENSITY gives the percent of the population in that state that is an illegal immigrant. The column labelled MEAN WAGE gives average of all the monthly wages from 1972-87. (1989). The column labelled STANDARD DEVIATION WAGE is the standard deviation of percentage changes in the monthly wage over the entire period. AVERAGE LOW-DENSITY represent unweighted average density, wages, and standard deviation for the 6 low-density states listed in the table. See text for details.

FIGURE 1

MANUFACTURING WAGE VOLATILITY

