

Backlash: Effects of 9/11 on Muslims and Arabs Living in the U.S.

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## **Abstract**

We investigate the effect of the September 11<sup>th</sup> terrorists' attacks on the employment, earnings, and location choices of first- and second-generation Arabs and Muslims living in the US. We conduct a multivariate regression analysis with a difference-in-differences research design and find that September 11<sup>th</sup> was not associated with the employment and hours of work of Arabs and Muslims. However, September 11<sup>th</sup> was associated with an eight percent decline in the real wage and weekly earnings of Muslim and Arab men and a four to six percent decline in the real wage and weekly earnings of Muslim and Arab women. The estimates pertaining to women are not statistically significant. Estimates also suggest that the terrorists' attacks reduced the internal migration of Arabs and Muslims within the US.

## Introduction

A growing number of Arabs and Muslims living in the United States have become victims of hate crime and ethnic and religious profiling since the September 11<sup>th</sup>, 2001 terrorists' attacks on the World Trade Center and Pentagon (Human Rights Watch 2002). The 2001 FBI annual hate crime report and state and local agency data show a significant increase in violence against these groups and those perceived to be like them such as South Asians, in particular Sikhs.<sup>1</sup> Polls conducted by various advocacy groups find that 20 to 60 percent of American Muslims and Arabs say that they personally experienced discrimination since the September 11<sup>th</sup> attacks (Human Rights Watch 2002). In addition, Arabs and Muslims have reported increased incidence of discrimination at work since the terrorists' attacks. In the first eight months after the attacks, the U.S. Equal Employment Opportunity Commission (EEOC) received 488 complaints of September 11<sup>th</sup>-related employment discrimination, of which 301 involved persons who were fired from jobs (<http://www.eeoc.gov/press/5-15-02.html>).

While there is some research on the economic and psychological effects of September 11<sup>th</sup> on New York residents, there is none that looks at the effects on immigrants nationally, in particular on Arabs and Muslims, a group that has become an object of public anger and suspicion in the aftermath of the attacks.<sup>2</sup> The objective of this study is to investigate whether September 11<sup>th</sup> adversely affected the employment, earnings, and location choices of first- and second-generation immigrants from countries with predominantly Arab or Muslim populations. For convenience we will refer to these persons as Arabs and Muslims. Our findings will shed

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<sup>1</sup> According to the 2001 FBI hate crimes report, the number of anti-Muslim hate crimes rose from twenty-eight in 2000 to 481 in 2001. A Human Rights Watch report (November 2002) cites data from local and state agencies that indicate growing hate crime against Muslims. In Chicago, for instance, the police department reported 51 anti-Muslim hate crimes during September-November 2001, as compared with only four such cases during the entire year 2000. In Los Angeles County, there were only 12 hate crime cases against people of Middle-Eastern descent in 2000, as compared with 188 in 2001 (Human Rights Watch Report 2002).

<sup>2</sup> See Bram et al. (2002), Bram et al. (2002), Gaela et al. (2002), Citizen's Committee for Children (2002) and Garfinkel et al. (2004) for the effects of the September 11<sup>th</sup> attacks on New York residents.

light on whether the terrorists' attacks and their aftermath resulted in economic harm to Muslims and Arabs living in the US.

### **Theoretical Considerations**

The terrorists' attacks on September 11<sup>th</sup> appear to have triggered ill feelings towards Arabs and Muslims, which may have resulted in labor market discrimination. Employers (managers) may act on their (new) prejudices by hiring fewer, or by firing or laying off more, Arabs and Muslims than would otherwise have been the case. Consequently, the employment of Arabs and Muslims may be adversely affected, as will be their wages since those who lose jobs may be forced to seek employment elsewhere presumably at lower wages. Similarly, employers (managers) may limit or deny Arabs and Muslims wage increases and promotional opportunities, which would adversely affect their wages.

September 11<sup>th</sup> may have also adversely affected labor market outcomes of Arabs and Muslims because of statistical discrimination. Employers may perceive that hiring or promoting Muslim and Arab workers is risky, either because of security concerns or uncertainty over the permanency of Arab and Muslim immigrants' stay in the United States (Swarns and Drew 2003; Swarns 2003). Therefore, they would be less likely to hire or promote such workers, and this would adversely affect the employment and wages of Arabs and Muslims.

Employee discrimination is also possible. Non-Muslim employees may shun and not cooperate with Arab and Muslim coworkers, which will harm employee productivity, particularly that of Arabs and Muslims. This will tend to depress the wages of Arabs and Muslims, and may also induce employers not to hire or even fire them. It may also cause Muslims and Arabs to voluntarily (under duress) leave jobs where hostility is present and seek employment elsewhere, for example in locations or establishments that are more welcoming of Arabs and Muslims. Limiting opportunities in this way would adversely affect the wages of Arabs and Muslims and may also reduce their employment. Customer discrimination, which is limited to certain

occupations with significant customer contact (e.g. retail, self-employment), may also reduce employment opportunities of Arabs and Muslims and lower their earnings (Borjas and Bronars 1989, Nardinelli and Simon 1990)<sup>3</sup>.

Labor market discrimination could lead to behavioral responses on the part of Arabs and Muslims. If discrimination results in lower wages, Arabs and Muslims may increase or decrease their labor supply depending on the relative size of the income and substitution effects. If the income effect is dominant, Muslims and Arabs will respond by increasing labor supply; if the substitution effect dominates they will reduce their hours of work or leave the work force. Empirical evidence suggests that the substitution effect is quite small and therefore, we may expect discrimination to lead to greater labor supply (Killingsworth 1983, Mroz 1987, Blundell and MaCurdy 1999).

Similarly, discrimination and hate crime may affect migration and location choices of Arabs and Muslims; they may decide to leave the US or they may change their residential locations in search of less hostile environments within the country. The latter will occur only if Arabs and Muslims are certain that they would find a more hospitable environment in another location. It may be more likely that discrimination will create an unwillingness to leave ethnic enclaves or current locations that provide security in hostile times. Uncertainty about job prospects and fears of how they would be received in a new community may reduce their internal migration. The migration choices of Muslims and Arabs could offset some of the wage and employment effects of discrimination.<sup>4</sup>

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<sup>3</sup> Unweighted means from the March CPS suggest that approximately 10 percent of the first and second generation individuals from countries with predominantly Arab and Muslim populations are self-employed, as compared to only 7.7 percent of the other US-born, suggesting some vulnerability to customer discrimination.

<sup>4</sup> It is conceivable that emigration may improve observed employment outcomes. For instance, if 10 percent of the non-employed and only two percent of the employed Muslim and Arab men fled the country after September 11<sup>th</sup>, the compositional changes in the sample would create an estimation bias, which would be reflected in an increase in employment rate of Arab and Muslim men.

In sum, the events of September 11<sup>th</sup> have caused significant changes in the US including a greater suspicion and fear of Muslims and Arabs. Indeed, the September 11<sup>th</sup> terrorists' attacks led to government sanctioned ethnic profiling. The US government issued a "special registration" order that required non-permanent resident men aged 16 years or older from 24 countries with predominantly Muslim or Arab populations to register with the Bureau of Citizenship and Immigration Services, where they were fingerprinted, photographed and interviewed; and several thousand were deported back to their home countries.<sup>5</sup> The widespread fear engendered by September 11<sup>th</sup> may have increased prejudice against Arab and Muslim immigrants that may have adversely affected their employment, wages and decisions about where to live.

## Research Design and Statistical Methods

### *Labor Market Outcomes*

The first objective of this paper is to obtain estimates of the effect of the September 11<sup>th</sup> attacks on the employment and wages of Arabs and Muslims living in the US. We begin by measuring the pre- to post-September 11<sup>th</sup>, 2001 changes in labor market outcomes of Arabs and Muslims. We use the following regression model:

$$\begin{aligned}
 \text{Emp}_{ist} &= \alpha_0 + \alpha_1 \text{Sept}_t + X_{ist} \Gamma + Z_{st} \Lambda + \delta_t + \gamma_s + u_{ist} \\
 i &= 1, \dots, N \\
 (1) \quad s &= 1, \dots, 51 \\
 t &= 1999(1), \dots, 2002(12)
 \end{aligned}$$

where  $\text{Emp}_{ist}$  is a labor market outcome of person  $i$  in state  $s$  and time  $t$ . We study four outcomes: whether employed last week, usual hours worked per week (including zeros for those not employed), and for those employed, real hourly earnings and real weekly earnings. The

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<sup>5</sup> According to newspaper reports, over 130,000 male visitors, students, tourists, businessmen, or those on other temporary visas (predominantly Muslims) were interviewed between December 2002 and April 25, 2003. Of these, 10 percent have been given orders for deportation. Newspaper reports also indicate large scale fleeing of undocumented immigrants to Canada (Swarns and Drew, New York Times, April 25, 2003; Swarns, New York Times, June 9, 2003).

variable  $Sept_t$  is a dummy variable equal to 1 if the observation is taken from the post-September 2001 period and zero otherwise. Other variables in equation (1) are as follows:  $X_{ist}$  is a vector of individual characteristics that include age, education, race, marital status, gender, number of years lived in the US, occupation and industry type<sup>6</sup>, citizenship status and country of birth;  $Z_{st}$  is the state unemployment rate<sup>7</sup>;  $\delta_t$  is a monthly time trend specified as a quadratic function, which is intended to control for business cycle trends in labor market outcomes during the period of the study;<sup>8</sup> and  $\gamma_s$  are state effects. The parameter  $\alpha_1$  measures the pre- to post-September 11<sup>th</sup> changes in employment and earnings.

Ideally, we want to obtain “causal” estimates of the effect of the September 11<sup>th</sup> terrorists’ attacks. Equation (1) provides such an estimate as long as there are no unmeasured factors correlated with September 11<sup>th</sup> that also affected labor market outcomes. Obviously, the recession that began in March 2001 is one potential confounder even though we include a monthly (quadratic) time trend to control for business cycle effects, and allow these effects to differ by industry. To address this and other threats to the validity of our estimates, we adopt a comparison group approach, which is also referred to as a difference-in-differences (DD) methodology. To implement this approach, we select a group that is similar to Arabs and Muslims but unlikely to be affected by the animosity and religious and ethnic profiling engendered by the September 11<sup>th</sup> attacks. The identifying assumption of the DD procedure is that in the absence of the September 11<sup>th</sup> attacks persons in the comparison group would have similar labor market experiences as Arabs and Muslims. Therefore, we can use pre- to post-September 11<sup>th</sup> changes in labor market outcomes of the comparison group to eliminate the effect

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<sup>6</sup> Controls for occupation type and industry of work are introduced in the analyses with real wage and weekly earnings as dependent variables.

<sup>7</sup> State unemployment rate is likely to be endogenous in the analyses with ‘whether worked last week’ or ‘hours worked’ as dependent variables. Therefore, we control for state unemployment rate only in the analysis of real wage and real weekly earnings.

<sup>8</sup> Over a relatively short period, as in the current context, a quadratic time trend may be expected to approximate reasonably well, unmeasured, time-varying influences.

of unmeasured factors from the pre- to post-September 11<sup>th</sup> changes in labor market outcomes of Arabs and Muslims.

Estimates of the effect of September 11<sup>th</sup> based on the comparison group approach are obtained using a pooled sample of Arabs and Muslims and persons in the comparison group. The regression model using this sample is given by:

$$(2) \quad Emp_{ist} = \alpha_0 + \alpha_1 Sept_t + \alpha_2 Tr_j + \alpha_3 (Sept_t * Tr_j) + X_{ist} \Gamma + (X_{ist} * Tr_j) \tilde{\Gamma} + Z_{st} \Lambda + (Z_{st} * Tr_j) \tilde{\Lambda} + \delta_t + (\tilde{\delta}_t * Tr_j) + \gamma_s + (\tilde{\gamma}_s * Tr_j) + u_{ist}$$

$Tr_j$  is equal to 1 if the individual is an Arab or Muslim, and zero otherwise. Equation (2) reflects the least restrictive specification possible, as all effects are allowed to differ by target-comparison group status. The parameter  $\alpha_3$  measures the difference-in-differences effect of September 11<sup>th</sup> on the labor market outcomes of Arabs and Muslims.

The specifications of equations (1) and (2) assume that the September 11<sup>th</sup> attacks generated the same level of fear and prejudice against Arabs and Muslims in all parts of the country. However, two recent reports by the American-Arab Anti-Discrimination Committee (Ibish and Stewart 2003) and the Council on American-Islamic Relations (CAIR 2002) suggest that the amount of discrimination varied by location. We can incorporate this information in our analysis by investigating whether labor market outcomes of Muslims and Arabs were more adversely affected in places with a higher degree of demonstrated intolerance towards Muslims and Arabs. Specifically, we allow the effect of September 11<sup>th</sup> to differ according to an index of hate crime/discrimination against Arabs and Muslims. We use three measures of September 11<sup>th</sup> related hate crime or discrimination: number of hate crime/discrimination incidents reported in a state; number of hate crime/discrimination incidents per Arab population in a state; and number of hate crime/discrimination incidents per state population. While the first two capture the risk of discrimination Arabs and Muslims face in a state, the third is an indicator of the prevalence of

prejudice among the non-Arab (non-Muslim) population.<sup>9</sup> It is unclear which index is “correct.” Ideally, we want an accurate measure of the extent of discriminatory feelings in an area, but this information is not available. Given the less than perfect nature of these measures, we present the results using all three. These measures are described in greater detail in Appendix 5.

Equation (3) describes the first-difference model that incorporates the index of discrimination:

$$(3) \text{ Emp}_{ist} = \alpha_0 + \alpha_1 \text{Sept}_t + \alpha_2 (\text{Sept}_t * C_{st}) + X_{ist} \Gamma + Z_{st} \Lambda + \delta_t + \gamma_s + u_{ist}$$

Equation (3) differs from equation (1) in only one respect; it includes the variable  $C_{st}$ , which is a measure of hate crime/discrimination in state  $s$  in year  $t$ . Prior to October 2001,  $C_{st}$  is equal to zero in all states.<sup>10</sup> In the post-September 2001 period, this variable is equal to one of the three indicators of hate-crime/discrimination mentioned above. The specification of equation (3) allows September 11<sup>th</sup> to have an effect even when the hate crime index is zero, which it is in three states. This is a prudent specification given the imperfect nature of our index of discrimination. In this case, we are simply investigating whether the effect of September 11<sup>th</sup> differs in areas with higher or lower reported hate crimes and incidents of discrimination.

The difference-in-difference estimates for this analysis can be obtained using:

(4)

$$\text{Emp}_{ist} = \alpha_0 + \alpha_1 \text{Tr}_j + \alpha_2 \text{Sept}_t + \alpha_3 (\text{Sept}_t * \text{Tr}_j) + \alpha_4 (\text{Sept}_t * C_{st}) + \alpha_5 (\text{Sept}_t * C_{st} * \text{Tr}_j) + X_{ist} \Gamma + (X_{ist} * \text{Tr}_j) \tilde{\Gamma} + Z_{st} \Lambda + (Z_{st} * \text{Tr}_j) \tilde{\Lambda} + \delta_t + (\tilde{\delta}_t * \text{Tr}_j) + \gamma_s + (\tilde{\gamma}_s * \text{Tr}_j) + u_{ist}$$

The parameters of interest are  $\alpha_3$  and  $\alpha_5$ , which measure the effect of September 11<sup>th</sup> on the labor market outcomes of Arabs and Muslims.

<sup>9</sup> Per capita number of crimes also depends on the number of potential victims. A given “prevalence of prejudice” will result in more incidents per capita if the population of potential victims is larger.

<sup>10</sup> We do not have information on hate crimes prior to September 11<sup>th</sup>. Our assumption that there were zero hate crimes/discrimination incidents against Arab and Muslim immigrants in the pre-September 11<sup>th</sup> period will introduce some measurement error.

### *Location Choices*

As previously noted, estimates of the effect of September 11<sup>th</sup> on labor market outcomes may be mediated by migration. Arabs and Muslims may have left the country after September 11<sup>th</sup>. Lack of data prevents us from explicitly investigating whether September 11<sup>th</sup> resulted in the emigration of Arabs and Muslims from the US, but we provide some descriptive evidence that suggests that selective emigration was not a significant consequence of September 11<sup>th</sup>.<sup>11</sup> September 11<sup>th</sup> may have also affected the internal migration of Arabs and Muslims, for example, they may have moved out of places with high intolerance towards them. However, it is also possible that September 11<sup>th</sup> may have reduced migration of Arabs and Muslims because of the security they may feel in existing ethnic enclaves and the uncertainty about job prospects and how they would be received in new locales. To investigate whether September 11<sup>th</sup> caused greater migration to avoid discrimination, we examined the effect of September 11<sup>th</sup> on the following changes in residences of Arabs and Muslims:

- moved to a state with greater reported hate crime/discrimination as compared to the state of origin;
- moved to a state with lower hate crime/discrimination as compared to the state of origin;
- and non-movers, which includes intra-state movers.

To investigate whether September 11<sup>th</sup> caused Arabs and Muslims to reduce migration, we examined the effect of September 11<sup>th</sup> on the following changes in residence:

- moved to a different state;
- moved within the same state;
- non-movers.

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<sup>11</sup> Unfortunately, although the INS keeps an account of all documented arrivals, there is no account of those who left the country during a certain period.

We use the same comparison group approach to analyze location choices that we used for labor market outcomes. The estimation equation in this case is:

$$(5) \ln \left[ \frac{P_{ijct}}{P_{ij0t}} \right] = \mu_0 + \mu_1 \text{Tr}_j + \mu_2 \text{Sept}_t + \mu_3 (\text{Tr}_j * \text{Sept}_t) + X_{ijt} \Gamma + \phi \text{UN}_{st-1} + \chi_s + u_{isjt}$$

where  $P_{ijct}$  is the probability that individual  $i$  belonging to group  $j$  (target or comparison) makes residential choice  $c$  (one of the three categories) with  $P_{ij0t}$  as the reference category, which consists of non-movers. The model includes (origin) state fixed effects ( $\chi_s$ ); unemployment rate in the origin state last year ( $\text{UN}_{st-1}$ ); and individual characteristics ( $X_{ijt}$ ). We use a multinomial logit regression procedure to estimate this model, and report the marginal effects with the corresponding standard errors.

#### *Target and Comparison Groups*

Ideally, we would like to identify all persons of Arab and Muslim heritage, but this is not possible due to data limitations. Instead, we select first- and second- generation immigrants from all but two of the countries on the “special registration” list of the Department of Justice. These countries are: Bangladesh, Egypt, Indonesia, Jordan, Kuwait, Afghanistan, Algeria, Bahrain, Lebanon, Morocco, Oman, Qatar, Tunisia, United Arab Emirates, Yemen, Iran, Iraq, Libya, Sudan, Syria, Pakistan and Saudi Arabia. We have excluded Somalia and Eritrea because these countries could not be identified in our data. The “special registration” list excludes Turkey and Malaysia, countries with predominantly Muslim populations. Arguably Muslims from Turkey and Malaysia are as likely to be affected by September 11<sup>th</sup> related discrimination as other Muslims. Therefore, we also include first- and second-generation immigrants from Malaysia and Turkey. We call this group Target Group A.

Although Asian Indians have been excluded from “special registration,” India has the second largest population of Muslims in the world. There have also been reports of Sikhs becoming objects of hate crime since September 11<sup>th</sup> (Human Rights Watch 2002). Therefore, we also do the analysis with a second target group, Target Group B, which includes the first- and second-generation immigrants from India in addition to those included in Target Group A. Inclusion of non-Muslim (and non-Sikh) Indians adds some contamination to our target group, as there is little evidence that non-Muslim and non-Sikh Indians have faced discrimination after September 11<sup>th</sup>. As a result, estimated coefficients will be biased towards zero.<sup>12</sup>

The efficacy of the comparison group approach depends largely on the validity of the comparison group. An ideal comparison group should comply with two conditions: its members should not be victims of September 11<sup>th</sup>-related hate crime and discrimination; and unobserved factors contemporaneous with September 11<sup>th</sup> should have the same effect on the target and comparison groups. We experiment with two comparison groups, both of which are likely to meet the first condition. Comparison Group I consists of 1<sup>st</sup> and 2<sup>nd</sup> generation immigrants excluding those from countries in target group B, Mexico, Central America and the Caribbean. We exclude Mexico, Central America and the Caribbean so that our comparison group is similar to the target groups in terms of the key determinants of labor market outcomes such as education.<sup>13</sup> We test the sensitivity of our results by using another comparison group—Comparison Group II—that consists of all US-born persons excluding the second-generation individuals included in target group B.

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<sup>12</sup> The bias can be relatively large. For example, if 40 percent of the individuals in the second target group are unaffected by the September 11-related discrimination, the estimated coefficient would be 60 percent of the actual effect of September 11<sup>th</sup> on Muslims and Arabs.

<sup>13</sup> We also repeated the analysis restricting the comparison group to only 1<sup>st</sup> generation individuals from countries other than those in Group B. The results were similar to those using comparison group I. We also repeated the analysis with a comparison group that consisted of 1<sup>st</sup> and 2<sup>nd</sup> generation from countries other than group B, including individuals from Mexico, Central America, and the Caribbean. Again, the estimated results did not differ much. Since Comparison Group I is similar to the target groups in terms of the key determinants of labor market outcomes such as education and generational structure, we present the results using this comparison group.

To test the validity of our difference-in-differences approach, we obtained DD estimates using data from 1997 to 2000 with a pseudo intervention that we specified to have occurred on December 31<sup>st</sup>, 1999. Since there were no terrorists' attacks or other major events that heightened anti-Arab and anti-Muslim feelings during the 1997 to 2000 period, our difference-in-differences estimates should be zero. In fact, pseudo difference-in-differences estimates were close to zero and statistically insignificant for all regressions relating to men in Target Group A, using both the comparison groups. In the case of women in Target Group A, the estimated results were close to zero and not statistically significant for three outcomes - employment, hours worked and real wage; but the DD estimates were positive and statistically significant for weekly earnings, using either comparison group. In general, the results of this exercise support the choice of comparison groups and the identifying assumption of the difference-in-differences procedure.

## **Data**

We use two different datasets in the analysis. To investigate the effect of September 11<sup>th</sup> on the labor market outcomes of Muslims and Arabs, we use the Current Population Survey, merged outgoing rotation groups files (CPS-ORG) for 1999-2002. One advantage of the CPS-ORG is that it provides relatively large sample sizes, which are important given our interest in a narrowly defined population—individuals of Arab and Muslim descent. However, it does not provide information on state of residence in the last year, so for the analysis of residential choice we use the March series of the CPS for 1999-2003, which yields smaller sample sizes.

Both CPS datasets provide information on respondents' and their parents' nativity, which is used to define the target and comparison groups. The CPS individually identifies 12 of the 24 countries listed for "special registration" and 10 others are classified into two regions: rest of North Africa and rest of Middle East, leaving out the two countries in East Africa: Somalia and Eritrea. The CPS identifies people born in Somalia and Eritrea as "other Africans." Since many

countries classified by the CPS as “other Africa” are not included in the “special registration” list, we exclude persons from Somalia and Eritrea from the target groups.

We restrict our samples to the working-age population – that is, 16 to 65 year old men and women. We select a 25 percent random sample of the US-born comparison group, to reduce the computational burden associated with the large number of observations for this group. As sample sizes presented in Tables 1 and 7 indicate, the 25 percent sample of the US-born comparison group provides sufficient observations to conduct the analysis.

The two datasets have all the basic information required for the analysis. For instance, the data provide information on demographic characteristics of individuals such as their age, gender, marital status, race, education, birthplace, parents’ birthplace, when arrived in the US, citizenship status, type of occupation and industry, and state of residence. State unemployment rates from the Bureau of Labor Statistics are merged with the CPS individual level data.

Appendix 5 contains a list of all variables used in the analysis with their definitions.

Two different sources of data on incidents of September 11<sup>th</sup>-related hate crime or discrimination are used to compute an index of hate crime/discrimination by state: the American-Arab Anti-Discrimination Committee Report (Ibish and Stewart 2003) and the 2002 Council on American-Islamic Relations (CAIR) report on the Status of Muslim Civil Rights in the US.<sup>14</sup> Ibish and Stewart (2003) document instances of September 11<sup>th</sup>-related hate crime and discrimination against Arab Americans during September 11, 2001 to October 11, 2002. The 2002 CAIR report documents instances of hate crime and discrimination against Muslims during March 2001 to March 2002. Both sources include only incidents reported to their organizations.

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<sup>14</sup> We did not use the FBI annual Hate Crimes Statistics because several states -- including Alabama, Louisiana and Mississippi -- do not participate fully in providing hate crime statistics to the FBI (Department of Justice Report 2000). State participation in providing hate crimes to the FBI is voluntary. Besides, most of the hate crimes reported by the FBI are incidents of anti-Semitism, and therefore, not valid for our analysis.

We combine the two data sources and compute the average number of hate crime and discrimination incidents reported in each state.<sup>15</sup> Data from the 2000 Census are used to estimate the Arab population, which is used to compute hate crimes/discrimination per Arab population in each state. State population from Census 2000 is employed to compute per capita hate crimes/discrimination incidents.

## Results

### *Descriptive Analysis: Labor Market Outcomes*

Table 1 provides descriptive statistics for the samples used in the analysis. Several points merit comment. First, the average education of the two target groups is higher than the average education level of the two comparison groups. For instance, 50 percent of the men in Group A (and 58 percent of the men in Group B) have a college degree, compared with only 35 percent among the comparison group of other 1<sup>st</sup> and 2<sup>nd</sup> generation men and 25 percent among the comparison group of US-born men. Second, on average men and women in the two target groups are two to five years younger than men and women in the two comparison groups. Third, although the employment rate among men from the two target groups is similar to the employment rate among men in the two comparison groups, the employment rate among women in the two target groups is lower than the employment rate among women in the two comparison groups. Fourth, in accordance with their education levels the hourly (and weekly) earnings of men and women in the two target groups are higher than the earnings of men and women in the two comparison groups. Fifth, 77 to 84 per cent of the target groups are 1<sup>st</sup> generation immigrants in the US, in comparison with only 54 to 57 percent of Comparison Group I.<sup>16</sup>

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<sup>15</sup> The two indices have a correlation coefficient of 0.92.

<sup>16</sup> To control for the generational composition of the target and comparison groups, all regression analyses have an indicator for whether foreign-born and the effect of this variable is allowed to differ for the target and comparison groups. We also tested the sensitivity of the analysis to the generational composition of the comparison group by repeating the regression analysis after restricting the comparison group to only 1<sup>st</sup>

Table 2 presents the means of labor market outcomes for the target and comparison groups before and after September 11<sup>th</sup>. These data suggest that men from Group A and B countries experienced a small and statistically insignificant decline in employment and hours worked after September 11<sup>th</sup>, which is consistent with the expected trend during recession. Men from group A countries also experienced a \$0.23 decline in real wage and a \$12 decline in real weekly earnings. Men from group B countries, on the other hand, experienced a \$0.41 increase in real wage and an \$11 increase in weekly earnings. All the changes in the men's labor market outcomes of the two target groups are relatively small and statistically insignificant.

Figures in Table 2 also suggest that the proportion employed among men in the two comparison groups fell by a small but statistically significant one to two percentage points and their weekly hours of work fell by about an hour. The real wage of the comparison group of other 1<sup>st</sup> and 2<sup>nd</sup> generation immigrants rose by \$0.35 and their weekly earnings increased by \$12; the real wage of US born men (other than those in Group B) rose by \$0.51 and their weekly earnings increased by \$ 17.

Using other foreign-born men as the comparison group, the unadjusted (for other covariates) difference-in-differences estimates suggest that September 11<sup>th</sup> had no effect on the employment of men from either Group A or B countries (-0.01+0.01); it raised their weekly working hours marginally—by approximately half an hour (-0.5+0.9 to -0.2+0.9); it lowered the real wage of men in Group A by \$0.58 (-\$0.23-\$0.35) and their weekly earnings by \$24 (-\$12 - \$12); and it had a negligible effect on the real wage and earnings of men in Group B. Using the US-born comparison group yields similar difference-in-differences estimates for employment and hours worked, and somewhat larger declines in real wage and earnings.

We also investigate the effect of September 11<sup>th</sup> on the labor market outcomes of Arab and Muslim women even though they were not the target of the Special Registration order from

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generation individuals from countries other than those in Group B, Mexico, Central America and the Caribbean. The results were similar to those using comparison group I.

the Department of Justice and are perhaps less likely to be victims of discrimination. Figures in Table 2 suggest that women from Group A countries experienced a statistically significant four percentage point increase in employment and approximately one hour increase in weekly working hours after September 11<sup>th</sup>. Women from Group B countries also experienced an increase in these outcomes after September 11<sup>th</sup>, though the changes were smaller than those for Group A women and often not statistically significant.

Unadjusted difference-in-difference estimates suggest that the employment of women in Group A increased by five percentage points and their weekly hours of work increased by approximately one and a half hours; the employment of women in group B increased by three percentage points and their weekly hours of work increased by about an hour. Unadjusted difference-in-differences estimates also suggest that the real wage of women in the two target groups increased by \$0.57 to \$1.27 after September 11<sup>th</sup> and their weekly earnings by \$4 to \$8.

To sum up, the descriptive evidence from Table 2 suggests that September 11<sup>th</sup> had modest effects on the labor market outcomes of Arab and Muslim men and women; Arab and Muslim men may have experienced a small decrease in earnings and Arab and Muslim women appear to have increased their labor force participation, hours worked and earnings. The latter result is inconsistent with a simple discrimination explanation that predicts a wage decrease, and perhaps an increase in labor supply as a result of the wage decrease. Here we find both wages and labor supply increasing. Arguably, other factors may have also affected the labor market outcomes of the two groups during this period. To address this issue, we now turn to the multivariate regression analysis outlined above.

#### *Multivariate Analysis: Labor Market Outcomes*

Table 3 has the regression-adjusted first-difference (based on equation 1) and difference-in-differences (based on equation 2) estimates of effect of September 11<sup>th</sup> on first- and second-generation men and women from Group A countries. Column headings indicate the dependent

variable for each regression. As noted, we use two comparison groups, and column sub-headings describe which group was used to obtain the estimates. Figures reported in each cell in this table are estimates from separate regressions. Each regression controls for age, education, race, marital status, number of years lived in the US, citizenship status, whether foreign-born, state and country effects.<sup>17</sup> The analysis also has a quadratic time-trend, which we allow to differ by industry.<sup>18</sup> Regressions with real wage and weekly earnings as dependent variables also control for state unemployment rate, occupation type and industry.<sup>19</sup> All estimates in the labor market analysis are obtained by ordinary least squares; standard errors are calculated under the assumption that observations from the same state-year are not independent (Huber 1967).

The first and third rows of Table 3 contain the first difference results in which the sample of analysis is restricted to men (or women) in Target Group A. The second and fourth rows of the Table provide results of the difference-in-differences analysis that uses a sample that includes members of the comparison group. In the difference-in-differences analysis, all controls are introduced separately for the target and comparison groups except for race and the interactions between industry dummy variables and the quadratic trend, which are restricted to have the same effect for the treatment and comparison groups.

The first difference results presented in Table 3 suggest that September 11<sup>th</sup> did not significantly affect the employment and weekly working hours of men in Target group A as the estimates are small (close to zero and small in relative terms) and statistically insignificant. However, estimates of the wage effects of September 11<sup>th</sup> suggest that this event lowered the real

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<sup>17</sup> Estimates with 1<sup>st</sup> and 2<sup>nd</sup> generation immigrants (excluding those in group B, Mexico, Central America and the Caribbean) as the comparison group have 111 country of birth dummy variables; estimates with the US born (other than Group B) as the comparison omit the country of birth effects; we impose this restriction as statistical tests fail to reject it. In the analysis restricted to the target group (the first difference estimates) we do not include country of birth effects, as statistical tests do not reject this restriction.

<sup>18</sup> Different industries may experience different business cycles, as the effect of recession might not have been uniform across industries. The estimated results would be biased if the target and comparison groups have different distributions across industries. We examined the distributions and found that they were statistically different for the target and comparison groups.

<sup>19</sup> We also repeated the analysis with interactions between industry dummy variables and state unemployment rate. The estimated effects were similar.

wage of Arab and Muslim men by a statistically significant \$1.63 and their weekly earnings by \$75. The difference-in-differences results in row two echo the first difference results; the estimated coefficients for employment and hours worked are modest and statistically insignificant; the real wage of men in target group A declined by \$1.59 and their weekly earnings by \$62 to \$66. The earnings effects represent an eight percent decline in real wage and weekly earnings.

Panel 2 of Table 3 has the first difference and difference-in-differences estimates for women in target group A. These estimates suggest that September 11<sup>th</sup> had a modest and statistically insignificant effect on the labor market outcomes of this group. After September 11<sup>th</sup>, employment increased by approximately two percentage points (four percent); hours worked increased by approximately one hour (five percent); hourly wages decreased by approximately \$0.50 (three percent); and weekly earnings decreased by \$33 to \$39 (six percent).

We also repeated the analysis in Table 3 for persons in target group B, which includes all members of Group A and 1<sup>st</sup> and 2<sup>nd</sup> generation immigrants from India. These results are in Appendix 1. Estimates from this analysis suggest that September 11<sup>th</sup> had small and statistically insignificant effects on the labor market outcomes of this group. This is consistent with the notion that because a significant proportion of Indians are non-Muslim, they are unlikely to be affected by September 11<sup>th</sup>-related discrimination. Consequently, estimates of the effect of September 11<sup>th</sup> will be muted when Indians are added to the target group.

#### *Dose-Response: Do the Effects of September 11<sup>th</sup> Differ by Incidence of Discrimination*

Public resentment towards Muslims after September 11<sup>th</sup> was not uniform across localities, as reported hate crime and discrimination was greater in some places than others. We use three measures of hate crime and incidents of discrimination to capture the level of intolerance towards Muslims and Arabs after the terrorists' attacks, and investigate whether the effects differ for Arabs and Muslims living in states with higher intolerance towards them. Table

4 presents the first difference estimates for Group A and Table 5 has the difference-in-differences estimates for this group with 1<sup>st</sup> and 2<sup>nd</sup> generation from countries other than Mexico, Central America, the Caribbean and Group B as the comparison.<sup>20</sup> The results for Group B are in Appendix 2 and 3. We present the coefficients on the September 11<sup>th</sup> dummy variable and the interaction between this dummy variable and the hate crime/discrimination index. All regression models have the same controls as the analyses in Table 3.

The first difference results in row 1 of Table 4 (based on equation 3) suggest that the effects of September 11<sup>th</sup> did not differ significantly in areas with more or less reported hate crime/discrimination. There are only a few interactions that are significant. When the number of hate crime/discrimination incidents is used as an indicator of intolerance towards Arabs and Muslims, an additional incident of hate crime/discrimination raised the real wage of men by \$0.02 and their weekly earnings by \$1. This is a surprising and counterintuitive finding that strongly suggests the number of incidents is not a good indicator of intolerance. We examine this issue further by employing two other measures of intolerance – incidents per Arab population and incidents as a proportion of total population. The results of this analysis are in rows 2 and 3 of Table 4, and indicate that the degree of intolerance has no effect on any of the labor market outcomes of Group A men; the estimated coefficients are mostly negative but never statistically significant. Therefore, we view the positive and statistically significant results in row 1 as spurious.

Results in the bottom panel of Table 4 suggest that the level of intolerance, regardless of how it is measured, has a negative and often statistically significant effect on the employment of women in Target group A and a negative, but statistically insignificant, effect on their hours worked. Comparing this finding with the positive but insignificant effect of September 11<sup>th</sup> suggests that the negative effect of September 11<sup>th</sup> on the employment of Group A women was

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<sup>20</sup> We also repeated the DD analysis with comparison group II – US born other than Group B. The estimated results were almost the same. Due to space considerations, we do not present those results.

confined to a few states with greater intolerance towards Arabs and Muslims. When the number of incidents is used to measure intolerance, the estimated results suggest that increased intolerance led to higher wage of women, but this result is not confirmed when we use the other two measures of intolerance. Finally, the number of incidents has no effect on weekly earnings; but an increase in incidents per Arab population, as well as an increase in incidents per total state population, lowered the weekly earnings of women in Group A.

The difference-in-differences results presented in Table 5 mostly echo the results in Table 4 with one exception: the odd outcome in Table 4 of increase in earnings with an increase in incidents of hate crime/discrimination is not found. These estimates suggest that the number of incidents has no statistically significant effect on the labor market outcomes of men and women in Group A. Analyses using the other two indices of crime/discrimination, however, suggest that an increase of intolerance had a negative and sometimes statistically significant effect on the labor market outcomes of the members of the target group. An increase of one incident of hate crime/discrimination per 1000 Arab population reduced the employment of men by a statistically insignificant one percentage point; lowered their hours of work by approximately three quarters of an hour; lowered their real wage by a statistically significant \$0.41 and their weekly earnings by a statistically insignificant \$16. An increase of one incident of hate crime/discrimination per 1000 Arab population lowered women's employment by a statistically significant two percentage points; had a negative but statistically insignificant effect on their hours worked and real wage, and lowered their weekly wage by \$40.

When the index of hate crime/discrimination is the number of incidents per capita, an increase of 10 incidents per million state population lowered the employment of Group A men by a statistically insignificant two percentage points; reduced their hours of work by approximately one hour; lowered their real wage by a statistically significant \$0.85 and their weekly earnings by a statistically insignificant by \$ 36. Similarly, increase in incidents of hate

crime/discrimination per capita had a negative effect on the labor market outcomes of women in Target group A and the effects were sometimes statistically significant.

To sum up, the first difference estimates based on the degree of intolerance in the state of residence suggest that while the degree of intolerance did not affect the labor market outcomes of men in Target group A, it had a negative effect on the employment and weekly earnings of women. The difference-in-differences estimates, however, suggest that the negative effect of September 11<sup>th</sup> on both men and women in group A was higher in states with a greater degree of intolerance towards Arabs and Muslims.

The disagreement between the first difference and difference-in-differences estimates merits comment. Theoretically, the difference-in-differences estimates are to be preferred, and these estimates suggest that the adverse effects of September 11<sup>th</sup> differ by reported hate crime. This is an intuitively plausible finding. However, we believe some caution is appropriate. Consider the finding that wages of Arabs and Muslims are lower where hate crime/discrimination is higher. This result is due not to an absolute and relative decline in wages among Arabs and Muslims in areas with more reported discrimination, which is what we found when we restricted the effect of September 11<sup>th</sup> to be the same across states (Table 3). Instead, it is due to increases in the wages of persons in the comparison group in areas with more reported discrimination. Therefore, we place less weight on the estimates that use the indices of discrimination.

### *Location Choices*

Next we investigate whether September 11<sup>th</sup> altered the internal migration of Arabs and Muslims. Theoretical considerations suggest that September 11<sup>th</sup> may have increased or decreased migration. We have conducted two analyses to investigate how September 11<sup>th</sup> affected the internal migration of Arabs and Muslims. First, we used the index of hate crime/discrimination to define whether a person moved to avoid discrimination. In this analysis, we examined moves from high- to low-intolerance states, low- to high-intolerance states, and

non-moves (including intra-state moves). Second, we examined whether a person moved to a new state, regardless of the level of intolerance, moved within state, or did not move. The former analysis revealed that September 11<sup>th</sup> decreased all types of moves, and not just what may be considered strategic moves to avoid hostile places. Here we present only the latter analysis as we remain cautious regarding the adequacy of the crime indices used to define moves in the first analysis.

Table 6 has the descriptive statistics on the internal migration of our target and comparison groups before and after September 11<sup>th</sup>, and points at three important aspects of their residential choices. First, prior to September 11<sup>th</sup>, residential mobility, both intra- and inter-state, was higher among the target groups than among the comparison group. Second, after September 11<sup>th</sup>, there was a distinct decline in the proportion of the target groups that made a residential move of either type, particularly for target group A. And three, there are only marginal changes in the proportion of moves among the comparison group after September 11<sup>th</sup>.

Table 7 presents the results of the multivariate analysis for target group A; the top row contains the first-difference estimates and the bottom row contains the difference-in-differences estimates that use 1<sup>st</sup> and 2<sup>nd</sup> generation immigrants from countries other than Group B, Mexico, Central America and the Caribbean as the comparison group.<sup>21</sup> A similar analysis for Group B is presented in Appendix 4. Each regression controls for age, education, race, marital status, gender, whether a respondent has children less than 18, number of years lived in the US, citizenship status, whether foreign-born and state of last residence. We also control for unemployment rate in the state of residence last year, and its effect is allowed to be different for the target and comparison groups in the difference-in-differences analysis.

As mentioned each dependent variable has three categories; two of them are listed as column sub-headings and the third, which is the category of comparison, consists of non-movers.

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<sup>21</sup> The difference-in-differences estimates using the comparison group of US born other than those in group B yielded the same results as those obtained with comparison group I. We do not report those results due to space considerations.

The figures in each row are from a single regression. Estimates are obtained using a multinomial logit model. Marginal effects of the probability of being in a given category are reported along with the corresponding standard errors (adjusted for heteroscedasticity).

Estimates suggest that September 11<sup>th</sup> reduced both the inter-state and intra-state moves by Arabs and Muslims. The first difference results presented in row one show that the intra-state moves by Arabs and Muslims fell by 2.3 percentage points (15 percent) and their inter-state moves fell by 0.5 percentage points (10 percent). The difference-in-differences estimates suggest that the intra-state moves of Arabs and Muslims declined by 1.5 percentage points (10 percent) and their inter-state moves fell by 1.6 percentage points (32 percent).

In sum, these results suggest that the September 11 terrorists' attacks reduced the internal migration of Arabs and Muslims. This is consistent with the hypothesis that fears engendered by September 11 (or actual experience of discrimination) restricted the internal mobility of Arabs and Muslims living in the US.

## **Conclusion**

We investigated the effect of the September 11<sup>th</sup> terrorists' attacks on the labor market outcomes and location choices of first- and second-generation Arabs and Muslims living in the US. We find that September 11<sup>th</sup> was not associated with changes in employment or hours worked of Arabs and Muslims, but appeared to have lowered the real wage and weekly earnings of Arab and Muslim men and women. Estimates suggest that wages and weekly earnings decreased by eight percent for men and four to six percent for women. The estimates pertaining to women are not statistically significant.

We constructed three state-level indices of intolerance based on reported incidents of hate crime and discrimination against Arabs and Muslims. The difference-in-differences results using these indices provide some evidence of decline in employment of Arab and Muslim women in more intolerant states. We also find that the negative effects of September 11<sup>th</sup> on the real wage

and weekly earnings of Arabs and Muslims were somewhat larger in states with a higher reported incidence of hate crime/discrimination.

Finally, our research shows that the September 11<sup>th</sup> attacks appear to have decreased migration among Arab and Muslim men and women. These results suggest that fears (or actual experience) of discrimination and animosity perhaps led to a general “freeze” in the internal migration of Arabs and Muslims.

Our estimates of the earning effects could be biased if September 11<sup>th</sup> resulted in a selective outflow of Arabs and Muslims from the US. For example, high wage Arabs and Muslims may face better economic opportunities abroad, and may have left the country rather than adjust to the post-September 11<sup>th</sup> environment of increased hostility and greater restrictions on travel caused by increased visa-delays. To investigate the selective emigration hypothesis, we examined whether observed characteristics of the target group changed pre- and post-September 11<sup>th</sup>. The results of this analysis indicated that there was virtually no significant change in the composition (age, gender, education, foreign-born, citizen) of the target group pre- and post-September 11<sup>th</sup>. Thus, it is unlikely that the findings with respect to September 11<sup>th</sup> are due to selective emigration. However, even if there were selective migration, that itself would be an effect of September 11<sup>th</sup>.

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Table 1. Descriptive Statistics: Men and Women aged 16-65: 1999-2002  
(CPS Merged Outgoing Rotation Files)

	Target Group A		Target Group B		Comparison I (1 <sup>st</sup> & 2 <sup>nd</sup> generation immigrants excluding those from Group B, Mexico, Central America & the Caribbean)		Comparison II (US-Born other than Group B)	
	Men	Women	Men	Women	Men	Women	Men	Women
Education								
<12 years	0.12	0.13	0.10	0.12	0.15	0.14	0.16	0.14
= 12 years	0.17	0.22	0.14	0.18	0.25	0.28	0.32	0.32
=13-15 years	0.20	0.25	0.18	0.20	0.25	0.26	0.27	0.30
>15 years	0.50	0.40	0.58	0.50	0.35	0.32	0.25	0.24
Age	37	36	37	36	40	41	39	39
Employment	0.77	0.52	0.79	0.53	0.78	0.65	0.79	0.69
Hours worked	32	18	33	18	32	23	32	23
Hourly earnings	19.17	15.72	21.68	17.06	19.09	14.93	17.87	14.01
Weekly earnings	830.48	598.85	931.31	652.74	825.71	568.73	781.06	533.15
Married	0.54	0.61	0.56	0.64	0.58	0.59	0.56	0.54
Never Married	0.36	0.27	0.35	0.25	0.31	0.24	0.32	0.27
Citizen (including 1 <sup>st</sup> + 2 <sup>nd</sup> generation)	0.58	0.59	0.52	0.54	0.70	0.69	--	--
Proportion 1 <sup>st</sup> generation	0.82	0.77	0.84	0.81	0.54	0.57	--	--
Proportion 2 <sup>nd</sup> generation	0.18	0.23	0.16	0.19	0.46	0.43	0.07	0.07
Proportion 3+ generation	--	--	--	--	--	--	0.93	0.93
Living in the US								
< 5 Years	0.18	0.18	0.22	0.21	0.11	0.12	--	--
= 5 to 10 Years	0.14	0.14	0.15	0.15	0.08	0.09	--	--
>10 years (including 2 <sup>nd</sup> generation)	0.68	0.68	0.63	0.64	0.81	0.79	--	--
# of Observations	4325	3532	7261	6015	49063	53711	107,983	115,310
# of observations in earnings analysis	2543	1573	4592	2749	31460	30578	70,405	70,960

Note: Target Group A consists of individuals who were born in Afghanistan, Bangladesh, Egypt, Indonesia, Iran, Iraq, Jordan, Lebanon, Malaysia, Morocco, Pakistan, Palestine, Saudi Arabia, Syria, Turkey and other countries under the board heading of Middle East (excluding Israel) and North Africa. It also includes individuals with at least one parent born in the above-mentioned countries. Target Group B consists of Target Group A and individuals born in India or with at least one parent born in India.

Table 2. Descriptive Statistics: Men and Women aged 16-65: 1999-2002  
(CPS Merged Outgoing Rotation Files)

	Proportion Employed			Hours Worked			Real Hourly Earnings			Real Weekly Earnings		
	Before Oct. 2001	After Sept 2001	Diff.	Before Oct. 2001	After Sept 2001	Diff.	Before Oct. 2001	After Sept 2001	Diff.	Before Oct. 2001	After Sept 2001	Diff.
<b>Men</b>												
Target A	0.77	0.76	-0.01	32.0	31.5	-0.5	19.25	19.02	-0.23	834.65	822.64	-12.01
Target B	0.80	0.79	-0.01	33.1	32.9	-0.2	21.53	21.94	0.41	927.47	938.22	10.75
Comparison I	0.79	0.78	-0.01***	32.2	31.3	-0.9***	19.00	19.35	0.35***	821.81	833.52	11.71**
Comparison II	0.80	0.78	-0.02***	32.6	31.6	-1.0***	17.70	18.21	0.51***	775.24	792.50	17.26***
<b>Women</b>												
Target A	0.50	0.54	0.04*	17.4	18.6	1.2*	15.00	16.88	1.88***	588.13	616.51	28.38
Target B	0.52	0.54	0.02	18.0	18.6	0.6	16.61	17.85	1.24**	643.62	668.62	25.00
Comparison I	0.65	0.64	-0.01*	22.6	22.3	-0.3*	14.70	15.37	0.67***	561.51	582.79	21.28***
Comparison II	0.69	0.68	-0.01**	23.6	23.4	-0.2*	13.81	14.42	0.61***	526.31	546.33	20.02***

Note: Target Group A consists of individuals who were born in Afghanistan, Bangladesh, Egypt, Indonesia, Iran, Iraq, Jordan, Lebanon, Malaysia, Morocco, Pakistan, Palestine, Saudi Arabia, Syria, Turkey and other countries under the board heading of Middle East (excluding Israel) and North Africa. It also includes individuals with at least one parent born in the above-mentioned countries. Target Group B consists of Target Group A and individuals born in India or with at least one parent born in India. Comparison I consists of 1<sup>st</sup> and 2<sup>nd</sup> generation excluding those from Mexico, Central America, the Caribbean and Group B; and Comparison II consists of US-Born other than Group B. \* 0.05<p=<0.1, \*\* 0.01<p=<0.05, \*\*\*p=<0.01.

Table 3. First Difference and Difference-in-differences Estimates of the Effect of September 11<sup>th</sup> on the Employment, Hours Worked and Earnings of 1<sup>st</sup> and 2<sup>nd</sup> Generation Men and Women in Target Group A

	Proportion Employed		Hours Worked		Real Hourly Earnings		Real Weekly Earnings	
	Comparison I	Comparison II	Comparison I	Comparison II	Comparison I	Comparison II	Comparison I	Comparison II
<b>Men</b>								
First-difference (Target group only)	0.003 (0.031)		0.077 (1.636)		-1.633** (0.791)		-74.566* (39.250)	
Difference-in-difference	0.027 (0.030)	0.026 (0.029)	0.148 (1.567)	1.064 (1.595)	-1.593** (0.719)	-1.592** (0.758)	-65.693* (39.240)	-61.866 (39.806)
<b>Women</b>								
First-difference (Target group only)	0.020 (0.039)		1.452 (1.896)		-0.567 (1.685)		-36.101 (56.072)	
Difference-in-difference	0.020 (0.041)	0.026 (0.038)	1.136 (1.929)	0.990 (1.801)	-0.508 (1.698)	-0.415 (1.612)	-33.118 (54.324)	-38.929 (53.789)

Notes: Figures in each cell are from separate regressions. Dependent variables are listed in column headings. Each regression controls for age, education, race, marital status, number of years lived in the US, citizenship status, whether foreign-born, state and country fixed effects and a quadratic time trend. Regressions with real wage and weekly earnings as dependent variables also have nine occupation dummy variables, 12 industry dummy variables, interactions of the 12 industry dummy variables with the quadratic time trend, and state unemployment rate. Heteroscedasticity adjusted robust standard errors clustered around state-years are in parentheses. In the difference-in-differences analysis, all controls are introduced separately for the target and comparison groups, except for the effect of race, and the interactions between industry dummy variables and the quadratic trend, which are restricted to be the same for the two groups. Country effects are dropped in some regressions where statistical tests permit (details in the text). Also see Notes in Table 2 for the definitions of Target Group A and Comparison I and II. \* 0.05<p<0.1, \*\* 0.01<p<0.05, \*\*\*p<0.01.

Table 4. First Difference Estimates of the Effect of September 11<sup>th</sup> on the Employment, Hours Worked and Earnings of 1<sup>st</sup> and 2<sup>nd</sup> Generation Men and Women in Target Group A, based on the degree of Intolerance in the State of Residence

	Proportion Employed		Hours Worked		Real Hourly Earnings		Real Weekly Earnings	
	Sept. 11	Sept. 11* Crime Index	Sept. 11	Sept. 11* Crime Index	Sept. 11	Sept. 11* Crime Index	Sept. 11	Sept. 11* Crime Index
	(1)	(1)	(2)	(2)	(3)	(3)	(4)	(4)
<b>Men</b>								
Crime Index measures:								
Number of incidents	-0.000 (0.035)	0.000 (0.000)	-0.021 (1.863)	0.002 (0.014)	-2.363*** (0.894)	0.019* (0.010)	-117.192*** (44.864)	1.095** (0.481)
Incidents per Arab population (Population in thousands)	0.008 (0.032)	-0.008 (0.008)	0.663 (1.699)	-0.870 (0.575)	-1.542* (0.808)	-0.121 (0.170)	-71.774* (39.816)	-3.736 (11.992)
Incidents per state population (Population in millions)	0.010 (0.031)	-0.002 (0.002)	0.678 (1.686)	-0.175 (0.110)	-1.636** (0.811)	0.001 (0.037)	-74.947* (39.810)	0.102 (2.410)
<b>Women</b>								
Crime Index measures:								
Number of incidents	0.050 (0.044)	-0.001** (0.000)	1.473 (2.240)	-0.000 (0.014)	-2.847 (2.233)	0.054** (0.026)	-92.175 (60.504)	1.334 (0.878)
Incidents per Arab population (Population in thousands)	0.026 (0.040)	-0.009 (0.006)	1.523 (1.978)	-0.102 (0.595)	-0.282 (1.754)	-0.361 (0.437)	-12.033 (58.546)	-30.480*** (10.795)
Incidents per state population (Population in millions)	0.027 (0.040)	-0.002* (0.001)	1.533 (1.941)	-0.022 (0.110)	-0.368 (1.746)	-0.050 (0.080)	-13.687 (57.751)	-5.587*** (2.017)

Notes: See Notes in Tables 2 and 3. \* 0.05<p=<0.1, \*\* 0.01<p=<0.05, \*\*\*p=<0.01.

Table 5. Difference-in-differences Estimates of the Effect of September 11<sup>th</sup> on the Employment, Hours Worked and Earnings of 1<sup>st</sup> and 2<sup>nd</sup> Generation Men and Women in Target Group A, based on the degree of Intolerance in the State of Residence (1<sup>st</sup> and 2<sup>nd</sup> generation men and women from countries other than Mexico, Central America, the Caribbean and Group B as the comparison)

	Proportion Employed		Hours Worked		Real Hourly Earnings		Real Weekly Earnings	
	Sept. 11	Sept. 11* Crime Index	Sept. 11	Sept. 11* Crime Index	Sept. 11	Sept. 11* Crime Index	Sept. 11	Sept. 11* Crime Index
	(1)	(1)	(2)	(2)	(3)	(3)	(4)	(4)
<b>Men</b>								
Crime Index measures:								
Number of incidents	0.025 (0.035)	0.000 (0.000)	-0.365 (1.783)	0.008 (0.017)	-1.679* (0.990)	0.006 (0.013)	-80.137 (53.303)	0.258 (0.626)
Incidents per Arab population (Population in thousands)	0.045 (0.032)	-0.009 (0.008)	0.364 (1.616)	-0.696 (0.614)	-1.097 (0.836)	-0.414* (0.229)	-54.119 (45.662)	-15.717 (13.282)
Incidents per state population (Population in millions)	0.047 (0.031)	-0.002 (0.002)	0.326 (1.604)	-0.122 (0.113)	-1.129 (0.828)	-0.085** (0.036)	-54.441 (45.466)	-3.598 (2.291)
<b>Women</b>								
Crime Index measures:								
Number of incidents	0.036 (0.043)	-0.000 (0.000)	0.205 (1.906)	0.006 (0.018)	-1.831 (2.290)	0.022 (0.030)	-77.274 (58.546)	0.380 (0.972)
Incidents per Arab population (Population in thousands)	0.023 (0.040)	-0.019** (0.007)	0.939 (1.809)	-0.984 (0.859)	-0.115 (1.912)	-0.618 (0.784)	-21.098 (56.843)	-40.453*** (13.534)
Incidents per state population (Population in millions)	0.022 (0.040)	-0.003** (0.001)	0.847 (1.785)	-0.171 (0.156)	-0.095 (1.895)	-0.139 (0.141)	-20.532 (55.865)	-8.716*** (2.664)

Notes: See Notes in Tables 2 and 3. \* 0.05<p=<0.1, \*\* 0.01<p=<0.05, \*\*\*p=<0.01.

Table 6. Descriptive Statistics: Residential Relocation of Individuals Aged 16-65  
(March CPS: 1999-2003)

	Sample Size	Intra-state movers		Inter-state movers	
		Before October 2001	After September 2001	Before October 2001	After September 2001
Target Group A	4281	0.15	0.11	0.05	0.03
Target Group B	7457	0.14	0.13	0.06	0.03
Comparison I	58456	0.11	0.10	0.03	0.03

Note: Sample size pertains to 1999-2003. See Notes in Table 2 for the definitions of target and comparison groups.

Table 7. First-Difference and Difference-in-differences Estimates of the Effect of September 11<sup>th</sup> on the Internal Migration of Target Group A  
(Multinomial Logit Estimates)

	Intra-state Moves	Inter-state Moves
First-Difference (Target Group only)	-0.023*** (0.009)	-0.005*** (0.002)
Difference-in-differences (Using Comparison group I)	-0.015* (0.009)	-0.016*** (0.005)

Notes: Figures in each cell are marginal effects from multinomial logit models with three categories, two are listed as column headings and the third category, also the category of comparison, consists of non-movers. Each row is a separate regression. Each regression controls for age, education, race, marital status, whether a respondent has children less than 18, unemployment rate in the state of residence last year, number of years lived in the US, citizenship status, whether foreign-born, gender and state (state of residence last year) effects. Heteroscedasticity adjusted standard errors are in parentheses. In the difference-in-differences analysis presented in Row 2 the effect of unemployment rate is allowed to be different for the target and comparison groups; all the other effects are restricted to be the same for the two groups. Also see Notes in Table 2 for the definitions of Target Group A and Comparison I.

\* 0.05<p<0.1, \*\* 0.01<p<0.05, \*\*\*p<0.01.

Appendix 1  
 First Difference and Difference-in-differences Estimates of the Effect of September 11<sup>th</sup> on the Employment, Hours Worked and Earnings of 1<sup>st</sup> and 2<sup>nd</sup> Generation Men and Women in Target Group B

	Proportion Employed		Hours Worked		Real Hourly Earnings		Real Weekly Earnings	
	Comparison I	Comparison II	Comparison I	Comparison II	Comparison I	Comparison II	Comparison I	Comparison II
<b>Men</b>								
First-difference (Target group only)	0.013 (0.023)		0.429 (1.406)		-0.278 (0.618)		-17.106 (24.589)	
Difference-in-difference	0.035 (0.023)	0.033 (0.022)	0.453 (1.285)	1.317 (1.369)	-0.300 (0.595)	-0.409 (0.631)	-14.768 (28.017)	-13.309 (25.464)
<b>Women</b>								
First-difference (Target group only)	0.002 (0.029)		1.278 (1.386)		-0.166 (1.218)		-7.477 (52.973)	
Difference-in-difference	0.003 (0.030)	0.008 (0.029)	0.958 (1.447)	0.799 (1.332)	-0.080 (1.233)	-0.072 (1.141)	-0.875 (49.623)	-6.241 (49.424)

Notes: See Notes in Tables 2 and 3. \* 0.05<p<0.1, \*\* 0.01<p<0.05, \*\*\*p<0.01.

Appendix 2. First Difference Estimates of the Effect of September 11<sup>th</sup> on the Employment, Hours Worked and Earnings of 1<sup>st</sup> and 2<sup>nd</sup> Generation Men and Women in Target Group B, based on the degree of Intolerance in the State of Residence

	Proportion Employed		Hours Worked		Real Hourly Earnings		Real Weekly Earnings	
	Sept. 11	Sept. 11* Crime Index	Sept. 11	Sept. 11* Crime Index	Sept. 11	Sept. 11* Crime Index	Sept. 11	Sept. 11* Crime Index
<b>Men</b>								
Crime Index measures:								
Number of incidents	0.014 (0.025)	-0.000 (0.000)	0.519 (1.481)	-0.002 (0.011)	-0.681 (0.688)	0.011 (0.008)	-38.437 (29.021)	0.570 (0.383)
Incidents per Arab population (Population in thousands)	0.018 (0.024)	-0.007 (0.007)	0.801 (1.473)	-0.582 (0.775)	-0.313 (0.646)	0.050 (0.260)	-17.494 (26.460)	0.553 (17.260)
Incidents per state population (Population in millions)	0.018 (0.023)	-0.002 (0.001)	0.848 (1.439)	-0.131 (0.147)	-0.338 (0.647)	0.017 (0.049)	-18.579 (26.402)	0.425 (3.278)
<b>Women</b>								
Crime Index measures:								
Number of incidents	0.014 (0.030)	-0.000 (0.000)	0.973 (1.547)	0.008 (0.013)	-1.685 (1.468)	0.039 (0.025)	-29.367 (49.802)	0.564 (0.836)
Incidents per Arab population (Population in thousands)	-0.004 (0.030)	0.008 (0.006)	0.938 (1.476)	0.499 (0.533)	-0.074 (1.272)	-0.119 (0.417)	-4.184 (56.360)	-4.213 (11.931)
Incidents per state population (Population in millions)	-0.002 (0.029)	0.001 (0.001)	0.970 (1.434)	0.090 (0.099)	-0.086 (1.258)	-0.021 (0.075)	-1.217 (55.366)	-1.616 (2.207)

Notes: See Notes in Tables 2 and 3. \* 0.05<p<0.1, \*\* 0.01<p<0.05, \*\*\*p<0.01.

Appendix 3. Difference-in-differences Estimates of the Effect of September 11<sup>th</sup> on the Employment, Hours Worked and Earnings of 1<sup>st</sup> and 2<sup>nd</sup> Generation Men and Women in Target Group B, based on the degree of Intolerance in the State of Residence (1<sup>st</sup> and 2<sup>nd</sup> generation men and women from countries other than Mexico, Central America, the Caribbean and Group B as the comparison)

	Proportion Employed		Hours Worked		Real Hourly Earnings		Real Weekly Earnings	
	Sept. 11	Sept. 11* Crime Index	Sept. 11	Sept. 11* Crime Index	Sept. 11	Sept. 11* Crime Index	Sept. 11	Sept. 11* Crime Index
<b>Men</b>								
Crime Index measures:								
Number of incidents	0.024 (0.024)	0.000* (0.000)	0.279 (1.428)	0.007 (0.013)	-0.207 (0.725)	-0.002 (0.011)	-6.450 (34.442)	-0.190 (0.513)
Incidents per Arab population (Population in thousands)	0.040* (0.023)	-0.005 (0.008)	0.859 (1.333)	-0.571 (0.862)	0.056 (0.629)	-0.395 (0.305)	4.862 (29.993)	-20.851 (19.319)
Incidents per state population (Population in millions)	0.040* (0.022)	-0.001 (0.001)	0.875 (1.305)	-0.117 (0.164)	0.057 (0.622)	-0.089* (0.051)	5.303 (29.801)	-4.778 (3.544)
<b>Women</b>								
Crime Index measures:								
Number of incidents	-0.003 (0.031)	0.000 (0.000)	0.145 (1.549)	0.022 (0.015)	-0.931 (1.512)	0.020 (0.028)	-2.163 (50.595)	-0.043 (0.935)
Incidents per Arab population (Population in thousands)	-0.002 (0.032)	0.004 (0.006)	0.809 (1.565)	0.107 (0.576)	0.292 (1.298)	-0.350 (0.587)	15.751 (53.049)	-18.045 (18.747)
Incidents per state population (Population in millions)	-0.002 (0.031)	0.001 (0.001)	0.737 (1.514)	0.038 (0.101)	0.356 (1.271)	-0.097 (0.103)	20.768 (51.876)	-5.450 (3.455)

Notes: See Notes in Tables 2 and 3. \* 0.05<p<0.1, \*\* 0.01<p<0.05, \*\*\*p<0.01.

Appendix 4. First-Difference and Difference-in-differences Estimates of the Effect of September 11<sup>th</sup> on the Internal Migration of Target Group B  
(Multinomial Logit Estimates)

	Intra-state Moves	Inter-state Moves
First-Difference (Target Group only)	-0.017*** (0.007)	-0.010*** (0.003)
Difference-in-differences (Using Comparison group I)	-0.002 (0.007)	-0.020*** (0.004)

Notes: See Notes in Tables 2 and 7. \* 0.05<p<0.1, \*\* 0.01<p<0.05, \*\*\*p<0.01.

Appendix 5: List of variables

Name	Description
Target group A	Consists of individuals who were born in Afghanistan, Bangladesh, Egypt, Indonesia, Iran, Iraq, Jordan, Lebanon, Malaysia, Morocco, Pakistan, Palestine, Saudi Arabia, Syria, Turkey and other countries under the board heading of Middle East (excluding Israel) and North Africa. It also includes individuals with at least one parent born in the above-mentioned countries.
Target group B	Target group A plus individuals born in India or with at least one parent born in India.
Comparison group I	1 <sup>st</sup> and 2 <sup>nd</sup> generation immigrants excluding those from countries in target group B, Mexico, Central America and the Caribbean
Comparison group II	US born other than those in target group B
Employment	=1 if worked last week; else=0
Hours worked per week	=Hours worked last week; including zeros for those not employed
Real wage	= hourly earnings (for hourly paid workers) = usual weekly earnings(before deductions)/usual hours of work; The variable is expressed in 2002 prices after adjusting for inflation using consumer price index; the variable excludes observations with real wage less than \$2 or more than \$ 250.
Weekly Earnings	Consumer price index adjusted weekly earnings expressed in 2002 prices; excludes observations with missing/excluded observations for real wage.
Occupation type	Nine categories: manager/executives; professional specialty and technicians; sales and administrative support; services except household; precision production and machine operators; transportation and material moving; handlers, equipment cleaners, helpers, laborers and household services; farming, forestry and fishing; and others
Industry category	Twelve categories: Agriculture, forestry and fisheries; mining; construction; manufacturing; transportation, communication and utilities; wholesale trade; retail trade; hospital and medical; educational, social services and other professional; public administration; Finance and Business and other services; and others.
Sept <sub>t</sub>	= 1 for all observations starting with October 2001. For all observations up to September 2001, the variable is equal to zero.
Number of Crime incidents	Reported incidents of crime/discrimination per state; the variable is average of reported crime incidents from the American-Arab Anti-Discrimination Committee Report (Ibish and Stewart 2003) and the 2002 Council on American-Islamic Relations (CAIR) report on the Status of Muslim Civil Rights in the US. It varies from 0 to 91.5.
Incidents per Arab population	Computed as number of crime incidents/Arab population (in '000) in a state in 2000. It varies from 0 to 8.11
Incidents per state population	Computed as number of crime incidents/state population (in millions) in 2000. It varies from 0 to 43.7
Age	Nine age dummy variables indicating the following age groups: 16-20, 21-25, 26-30, 31-35, 36-40, 41-45, 46-50, 51-55 and 56-65 years.
Education	Four dummy variables indicating education levels: less than 12 years of schooling, 12 years of schooling, 13-15 years of schooling and more than 15 years of schooling
Race	Four dummy variables indicating: Non-Hispanic white, Non-Hispanic black, Hispanics and others
Married	=1 if the person is married; else=0
Number of years since	Three dummy variables indicating: arrived in the US ≤5 years ago; arrived between 5 to 10 years ago; arrived ≥10 years ago.

arrived in the US	
Citizenship status	=1 if citizen, else=0
Foreign-born	=1 if foreign-born, else=0
Time-trend	Time trend is imposed on monthly data. Varies from 1 to 48
Time-trend squared	Varies from 1 to 2304
State unemployment rate	Continuous variable. Source: Bureau of Labor Statistics
Country effects	111 dummies indicating country of birth; those born in Puerto Rico and outlying area of the US (Guam, US Virgin Islands etc.) are considered US-born.
State effects	51 dummy variables for 50 states + Washington DC