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Changes in the earnings of Arab men in the US between 2000 and 2002

Abstract Using public-use microdata samples from the American Community Survey, we find that Middle Eastern Arab men and Afghan, Iranian, and Pakistani men experienced a significant earnings decline relative to non-Hispanic whites between 2000 and 2002. Further analyses based on the Juhn–Murphy–Pierce wage decomposition technique as well as quantile regression indicate that this earnings decline is not explained by changes in the structure of wages or in observable characteristics beyond ethnicity. Our interpretation is that the unanticipated events of September 11th, 2001 negatively affected the labor-market income of the groups most closely associated with the ethnicity of the terrorists.

Keywords Arab Americans · September 11th · discrimination

JEL Classification J71 · J31 · J23

1 Introduction

Shortly after the hijackings of four American aircraft on September 11, 2001 (henceforth 9-11), reports of labor-market discrimination and other xenophobic outcomes against Arab and Muslim men in the US flourished.[1] The American–Arab Anti-Discrimination Committee (ADC) Research Institute (2003) reports that complaints of employment discrimination against Arab Americans increased fourfold between September 2001 and October 2002, while charges of religious

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[1] For an overview of the rising discrimination against individuals of Arab and Middle Eastern descent following September 11th, see the American–Arab Antidiscrimination Committee Research Institute (2003) and Human Rights Watch (2002).

discrimination against Muslims filed with the Equal Employment Opportunity Commission (EEOC) more than doubled (from 392 to 841 cases) over the pre- and post-9-11 15-month intervals.

These negative repercussions might have also translated into lower earnings for Arab American men. For example, the 9-11 events could have created (or magnified) employer, employee, or customer biases against Arab immigrants from the Middle East. The short-run employment opportunities for members of this ethnic group might have also decreased if employers perceived that the post-9-11 negative attention reduced their labor-market stability.

Exploring changes in the earnings of Arab American men following 9-11 has obvious interest for social science and policy. As a social-science exercise, it presents itself as a likely natural experiment to study short-run labor-market phenomenon, particularly that related to labor-market discrimination.[2] The role of government and its policy to protect populations adversely affected by a negative association with the terrorist acts of co-ethnics also becomes an important issue for debate.

In this paper, we outline standard discrimination theory that predicts lower earnings for Arab American men shortly after 9-11, and we specifically examine the hourly earnings of men between the ages of 25 and 40 in the US from Arab countries, as well as from Afghanistan, Iran, and Pakistan in 2000 and 2002, using public-use microdata samples from the American Community Survey (PUMS ACS). Our empirical results indicate that Arab men from the Middle East and those from Afghanistan, Iran, and Pakistan experienced a significant earnings decline relative to US-born non-Hispanic whites between 2000 and 2002. This earnings decline was largest for those immigrants who had recently arrived to the US, in line with statistical discrimination predictions. Consistent with standard bias-type discrimination (e.g., Becker 1971), our results also indicate that the earnings of Middle Eastern Arab men fell the most in states with the largest population share of Arab Americans. Further analyses based on the Juhn–Murphy–Pierce wage decomposition technique, as well as quantile regression, indicate that this earnings decline is not explained by changes in the structure of wages or in observable characteristics beyond ethnicity.

2 Conceptual issues

One way to conceptualize the analysis of this paper is to assume that Arab men earn less in the short run than non-Hispanic whites because of employer, employee, or customer discrimination (Becker 1971). This theory argues that short-run wage gaps between majority and minority workers can arise because of a "discrimination taste" against minorities and because of the visibility of the group.[3] Consider

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[2] An important example of a natural experiment to study labor markets is Card's (1990) analysis of the impact of the sudden increase in the supply of labor on a region's native wages resulting from the Marielito migration to Miami in 1980. This paper takes a similar approach in that it explores the labor-market impact of a sudden shock on the earnings of workers most likely identified as having ethnic ties to suspected 9-11 terrorists.

[3] Whether or not discrimination-driven wage gaps persist into the long-run is a subject of much debate; for a review, see Stiglitz (1973) and Marshall (1973). Given the unexpected shock of the 9-11 events, our approach to this study only involves a short-run time frame.

Fig. 1. The horizontal axis represents concentration levels of Arab Americans, and the vertical axis represents the wages of Arab men relative to non-Hispanic whites. The downward sloping curve (d_0) shows that the relative wages of Arabs fall as the geographic or occupational concentration of this population increases, and the slope of this curve represents the intensity of the discrimination taste against them. If the concentration level of Arab Americans in a particular region is c^*, the short-run equilibrium relative wage between non-Hispanic whites and Arab workers occurs at r^* in Fig. 1.

It follows that a sudden increase in the intensity of discrimination or the visibility of Arab workers accentuates this earnings disparity, at least in the short run. Arguably, after the 9-11 events, the visibility of Arab American men increased, given the strong media attention targeted toward this group. It could also be argued that the "discrimination taste" against this group rose with respect to geographic concentration. Figure 1 illustrates the impact of these effects by comparing the d_0 curve with d_1; the downward shift from d_0 to d_1 shows an "across the board" effect of the negative information, while its steeper slope depicts the increase in the intensity of discrimination regarding the visibility of Arab men. A decline in the relative wages of Arab men follows (e.g., from r_0^* to r_1^* at the concentration level c^*), with the largest decline occurring in regions with the highest visibility or presence of Arab Americans.

An alternative way to conceptualize the foregoing issue is by using labor-market discrimination rooted in information (e.g., Phelps 1972). In this model, employers predict the productivity (and liability) of a worker on the basis of the expected relative performance of the workers' population. Applying this frame-work to the events of 9-11, employers might have expected an increase in the frequency of government-sponsored workplace inspections (and employee de-tentions or deportations) following 9-11 if they hired workers with potential
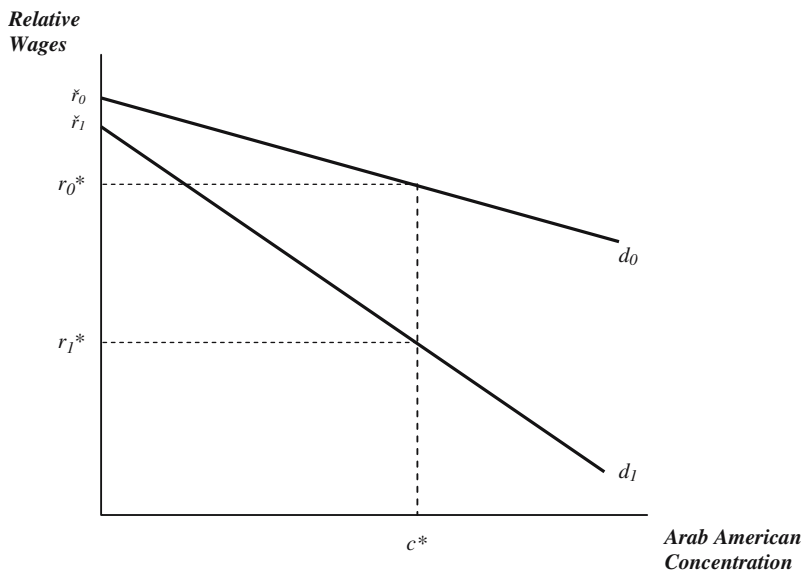

Fig. 1 Taste for discrimination model

terrorist ties. To be compensated for the risk of facing such additional costs, firms might have employed the workers associated with the ethnicity of 9-11 terrorists at lower wages than other workers, at least in the short run. Presumably, the former group would have been negatively affected by this type of employer perception, given the ethnic link between the suspected 9-11 perpetrators and immigrants from the Middle East.

While the conceptual explanations of the short-run impact of the 9-11 events predict lower earnings for men from the Middle East, it is not clear whether this effect would be uniform across regions or occupations. In the bias-based model, for example, the downward shift of *d* in Fig. 1 could have been a parallel shift, meaning that Middle Eastern Arab men would be equally affected, regardless of their geographic concentration. As depicted in Fig. 1, *d* also pivots downward while shifting, suggesting that groups with the highest concentration levels experience the largest relative reduction in their earnings. The information-based discrimination model also predicts that Arab workers with fewer ties to their current employers (or to the US-labor market) would have larger wage declines than their "tenured" counterparts. We next empirically test the foregoing predictions of lower earnings for Arab American men in the year following the 9-11 events, taking into account the uniformity of this effect.

3 Data and sample characteristics

Our empirical analyses use public-use microdata samples from the 2001 and 2003 American Community Surveys (PUMS ACS) administered by the US Bureau of the Census (2004). These data contain an approximate 1/250 sample of the US population in each year; the Census Bureau provides sampling weights to preserve the national representation of the data. Data on income earned in the year prior to the given ACS are included, such that the surveys in 2001 and 2003 relate to earnings accrued in 2000 and 2002. We exclude the 2002 ACS (containing income information for 2001) because the earnings paths and work schedules set forth at the beginning of 2001 were presumably interrupted by the 9-11 events.

Our sample of interest contains men most likely to be targeted by rising xenophobia following 9-11: younger men (i.e., between the ages of 25 and 40) from Arab countries as well as from Afghanistan, Iran, and Pakistan. While not Arab, these three latter countries represent those directly implicated in some of the post-9-11 rhetoric and policies. We also partition the Arab sample into "Middle Eastern Arab" and "African Arab" in light of the fact that the vast amount of media coverage following 9-11 specifically focused on the Middle East. Because other fundamental economic changes also occurred during this time period (such as the economic slowdown), we include as the base group of comparison US-born non-Hispanic whites who only speak English at home. Finally, we exclude individuals who worked less than 20 h a week or under 32 weeks in the year prior to the ACS.

Table 1 provides selected average characteristics observed in the PUMS ACS. Arab men earned slightly less on average (and those from other Middle Eastern countries earned slightly more) than non-Hispanic white men in both 2000 and 2002; earnings measure the total wage and salary income obtained in the year prior to the ACS divided by usual weekly work hours times the number of weeks worked. Note, however, that the average earnings of Middle Eastern Arab men

Table 1 Basic sample characteristics of male workers ages 25–40

Characteristic	Middle-Eastern Arab men		African Arab men		Afghan, Iranian, and Pakistani men		US-born non-Hispanic white men	
	2001 ACS	2003 ACS	2001 ACS	2003 ACS	2001 ACS	2003 ACS	2001 ACS	2003 ACS
Natural logarithm of hourly earnings in previous year	2.796 (0.697)	2.623 (1.378)	2.547 (0.628)	2.820 (0.809)	2.894 (0.748)	2.940 (0.749)	2.802 (0.613)	2.835 (0.645)
Education	14.397 (2.874)	14.406 (3.463)	15.016 (2.468)	14.742 (2.751)	15.094 (2.867)	15.575 (2.867)	13.911 (2.253)	13.981 (2.243)
Experience	14.076 (4.882)	13.861 (5.884)	13.204 (4.539)	14.076 (4.450)	13.528 (5.265)	13.214 (4.848)	14.518 (5.073)	14.064 (5.063)
Limited-English proficient	0.065 (0.248)	0.058 (0.234)	0.091 (0.289)	0.078 (0.270)	0.031 (0.173)	0.043 (0.202)	–	–
Years in US	12.997 (8.136)	13.521 (8.878)	9.530 (8.283)	13.277 (10.481)	13.352 (7.811)	13.875 (8.128)	–	–
N (unweighted)	213	189	147	119	268	248	71,909	64,489
N (weighted)	68,793	56,143	45,964	32,220	83,404	81,444	16,432,950	15,244,092

The parentheses contain standard deviations. These characteristics are based on US-born monolingual-English non-Hispanic white men, Arab men, and Afghan, Iranian, and Pakistani men between the ages of 25 and 40 who worked at least 20 h per week for 32 weeks or more in the previous year in the public-use microdata samples from the 2001 and 2003 American Community Surveys (ACS)

declined between 2000 and 2002, while the wages of other workers increased on average. On the surface, the decline in the average earnings of Middle Eastern Arab men following 9-11 supports the predictions from the models above.

Other characteristics in Table 1 indicate that Arab and Afghan, Iranian, and Pakistani men in the US possess relatively high skill levels. For example, their average education levels (14.4–15.6 years) slightly exceed the average schooling of non-Hispanic whites (around 14 years),[4] and their potential experience levels (measured by age–education–5) are only marginally lower on average. Few immigrant men from these regions also lack the ability to speak the English language well, probably because of their relatively long tenure in the US. Table 1 also provides evidence of a shrinking labor pool for both Arab and non-Hispanic white men between 2000 and 2002. This decline conforms to the drop in labor force participation and the increased unemployment rate observed in the US labor market during this time (e.g., see the Bureau of Labor Statistics at http://www.bls.gov/bls/employment.htm). Note that the decrease in the number of Arab men is larger than that of non-Hispanic whites, suggesting a disproportionately greater employment impact of 9-11 on Arab workers.[5]

4 Empirical analyses

We first estimate a standard earnings function for each year to explore the decline in the average earnings of Middle Eastern Arab men between 2000 and 2002 observed in Table 1:

$$\ln(W)_t = (\text{Middle Eastern Arab})\beta_{1t} + (\text{African Arab})\beta_{2t} + (\text{Other})\beta_{3t} + X_t B_t + e_t. \tag{1}$$

$\ln(W)_t$ represents the natural logarithm of hourly earnings in year t, while the estimations of the β_{it} coefficients will approximate the earnings differentials in year t between non-Hispanic white men and those most likely implicated by the events of 9-11: Middle Eastern Arab, African Arab, and "other" immigrant men implicated in post 9-11 policies (i.e., Afghan, Iranian, and Pakistani men).[6]

Vector X_t contains standard socioeconomic and demographic characteristics related to earnings (education, experience, experience-squared, being LEP,

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[4] We construct a continuous education measure by taking the midpoint of the education categories in the ACS, or where possible, the average number of years related to certain schooling levels (e.g., 16 years for a college degree).

[5] A closer perusal of the PUMS ACS data indicates that the share of Arab men between the ages of 25 and 40 who were not working increased during this same time period relative to non-Hispanic whites: 8.8% of Middle Eastern Arab men and 4.0% of non-Hispanic white men did not work in 2000, increasing to 11.6% (Middle Eastern Arab men) and 4.6% (non-Hispanic whites) in 2002. Similarly, the share of Middle Eastern Arab male workers employed for less than 20 h per week increased from 11.2 to 16.1% between 2000 and 2002, compared to an increase from 7.5 to 9.1% for non-Hispanic white employees. While non-wage issues related to changes in the employability of Arab vis-à-vis non-Hispanic white men following 9-11 go beyond the scope of this study, they serve as interesting fodder for future research.

[6] Due to the semilogarithmic construction of Eq. 1 and the binary nature of the ethnic group variables, a more precise earnings penalty than β_i can be obtained using the method discussed by Kennedy (1981). In this paper, for simplicity, we discuss the β_i's as estimates of earnings penalties.

immigrants' US-tenure, and geographic region [Northeast, Midwest, South Atlantic, South Central, and the West (base)]). B_t and e_t denote the coefficient vector for the variables in X and the normally distributed error term. To assess whether the coefficients of interest significantly changed between 2000 and 2002, we estimate a third regression with the pooled sample from both years, and interact all variables in Eq. 1 with a binary variable equal to one for individuals observed in the latter ACS; t tests on these ACS-interaction terms determine the statistical significance of the change in coefficients.

The first three columns in Table 2 provide the results from estimating Eq. 1 for 2000 and 2002 earnings using ordinary least squares (OLS). In 2000, Arab men (particularly those from Africa) and Afghan, Pakistani, and Iranian men earned significantly less on average than otherwise similar non-Hispanic white men. Of specific interest to this study is the observation that, following the events of 9-11, the average earnings of immigrant men associated with post 9-11 policies—young Middle Eastern men—significantly declined relative to their non-Hispanic white counterparts.[7] This finding indicates the presence of a significant perverse shift in the labor market between 2000 and 2002 against immigrant men targeted by negative media coverage following 9-11. As conceptually discussed above, increased employer, employee, or customer discrimination and information-based discrimination could have contributed to this shift. We also note that such a change did not occur among Arab men from Africa, suggesting that the negative earnings shock was confined to immigrant men most closely identified with the 9-11 terrorists.

In addition, Table 2 shows that US tenure played a stronger earnings role in 2002 than in 2000; each year an immigrant lived in the US enhanced earnings by 0.8% in 2000, but 2.5% in 2002. Recall that the information-based discrimination predicts a negative effect on the earnings of Arab (or Muslim) Americans following the 9-11 events because employers could use their ethnic ties to suspected terrorists as a means of statistical discrimination. More US tenure might have served as a mitigating factor on the perceived risk of employing these workers.

Did the relative earnings decline experienced by immigrant men from the Middle East occur in all regions? Recall that Becker's (1971) discrimination theory predicts that the concentration of minority workers inversely affects their labor-market income. We estimate an alternative version of Eq. 1 that includes interaction terms between the groups of interest and the share of Arab Americans within the state. The last three columns in Table 2 present the regression results. This concentration measure is based on the number of individuals of Arab ancestry divided by the total population in the state, as estimated by the US Bureau of the Census (2003). It should be noted that states represent the smallest identifiable geographic measure in the PUMS ACS.

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[7] Recall that the focus of this study is on younger men. When expanding the samples to include workers between the ages of 25 and 64, the estimation of Eq. 1 indicates that Middle Eastern Arab men continued to experience a significant (at the 5% level) average earnings decline relative to non-Hispanic white men; the coefficients (standard errors) on Middle Eastern Arab were −0.198 (0.056) for 2000 earnings and −0.454 (0.118) for 2002 earnings. The average earnings decline among Afghan, Iranian, and Pakistani men, however, is no longer statistically significant at conventional levels in the broader sample [coefficient (standard error)=−0.351 (0.072) for 2000 and −0.392 (0.066) for 2002].

Table 2 Earnings regression results for Middle Eastern Arab, African Arab, other Middle Eastern Arab, and US-born non-hispanic white men in 2000 and 2002 (dependent variable = natural logarithm of hourly earnings)

Characteristic	2000 earnings	2002 earnings	Statistically different?	2000 earnings	2002 earnings	Statistically different?
Middle Eastern Arab	−0.152* (0.066)	−0.584** (0.196)	Yes*	−0.286* (0.116)	−0.313* (0.156)	No
Mid East Arab × Arab share	–	–	–	0.208 (0.190)	−0.478^{+} (0.255)	Yes*
African Arab	−0.436** (0.072)	−0.484** (0.113)	No	−0.304* (0.128)	−0.522* (0.230)	No
African Arab × Arab share	–	–	–	−0.267 (0.229)	0.088 (0.357)	No
Afghan, Iranian, or Pakistani	−0.139* (0.070)	−0.429** (0.100)	Yes*	0.013 (0.137)	−0.567* (0.157)	Yes**
Afghan, Iranian, Pakistani × Arab share	–	–	–	−0.319 (0.276)	0.267 (0.250)	No
Population share of Arabs in state	–	–	–	0.278** (0.012)	0.260** (0.015)	No
Years in US	0.008** (0.003)	0.025** (0.006)	Yes**	0.006^{+} (0.003)	0.023** (0.005)	Yes**
Education	0.122** (0.001)	0.121** (0.002)	No	0.120** (0.001)	0.119** (0.002)	No
Experience	0.052** (0.003)	0.053** (0.003)	No	0.052** (0.003)	0.053** (0.003)	No
Experience^2/100	−0.088** (0.012)	−0.086** (0.012)	No	−0.089** (0.011)	−0.086** (0.012)	No
Limited-English proficient	−0.158 (0.180)	0.117 (0.145)	No	−0.169 (0.172)	0.107 (0.147)	No
Constant	0.586** (0.033)	0.609** (0.034)	No	0.548** (0.033)	0.578** (0.034)	No

The parentheses contain robust standard errors. These results are based on US-born monolingual-English non-Hispanic white men, Arab men, and Afghan, Iranian, and Pakistani men between the ages of 25 and 40 who worked at least 20 h per week for 32 weeks or more in the previous year in the public-use microdata samples from the 2001 and 2003 ACS. The unweighted (weighted) sample sizes equal 72,537 (16,631,111) in 2001 and 65,045 (15,413,899) in 2003. The statistical significance of the differences between coefficients was determined by estimating a third regression with the sampled pooled from both years, and interacting all variables in Eq. 1 with a binary variable equal to one for individuals observed in the latter ACS; t tests on these ACS-interaction terms indicated the statistical significance of the change in coefficients

*Statistically significant at the 5% level

**Statistically significant at the 1% level

$^{+}$Statistically significant at the 10% level

The statistically insignificant coefficient on the *Middle Eastern Arab* and *Arab share* interaction term for 2000 in Table 2 shows that the presence of fellow ethnics did not affect the earnings of Arab men differently than non-Hispanic whites that year. However, the share of Arab Americans in the state was negatively related to the earnings of Middle Eastern Arab men in 2002, indicating that those who resided in areas with high concentrations of Arab Americans experienced the largest earnings decline between 2000 and 2002. This result suggests, consistent with the predictions made in the conceptual section, that after 9-11, the wages of geographically concentrated Middle Eastern Arab men were negatively impacted the most. Table 2 also shows that the wages of African Arab men were not differently affected by the presence of Arab Americans than their non-Hispanic white peers during this time, possibly because presumed terrorist ties have not been prominently linked to Africa.

Juhn–Murphy–Pierce decomposition The results presented here support the premise that immigrant men in the US most likely associated with Middle Eastern terrorists experienced a significant earnings decrease after 9-11 relative to similar non-Hispanic whites. Despite our relatively short time frame, it is important to determine whether this result holds after accounting for observable changes in the returns to and amounts of human capital and other characteristics across the ethnic groups in our analyses. Perhaps the findings in Table 2 simply reflect changes in the returns to skills or regional cost-of-living differences that arose after 2000 as the labor market weakened.

One method commonly used in the literature to address this type of issue is the Juhn et al. (1993) technique (henceforth, JMP). The JMP method partitions a (usually) time-dependent earnings differential into observable differences in the returns to and quantities of observable and unobservable characteristics. Changes in earnings differentials measured by the unobservable components have been interpreted as a potential sign of changes in labor-market discrimination against a particular group (e.g., Blau and Khan 1994, 1997).

Consider a version of Eq. 1 that solely reflects the earnings structure of non-Hispanic white (NHW) men in year t:

$$\ln(W)_t^{\text{NHW}} = X_t^{\text{NHW}} B_t^{\text{NHW}} + \sigma_t^{\text{NHW}} \theta_t^{\text{NHW}}. \tag{2}$$

X_t^{NHW} and B_t^{NHW} represent vectors of observable characteristics and the returns to those characteristics for non-Hispanic whites. θ_t^{NHW} denotes a normal standardized residual, while σ_t^{NHW} is the residual standard deviation of non-Hispanic white earnings in year t. The wage differential between a minority group M and non-Hispanic whites in year t can therefore be expressed as:

$$\Delta W_t \equiv \ln(W)_t^{\text{NHW}} - \ln(W)_t^{\text{M}} = \Delta X_t B_t^{\text{NHW}} + \sigma_t^{\text{NHW}} \Delta \theta_t, \tag{3}$$

with Δ denoting the difference in the average variables in X and θ between M and non-Hispanic whites. As such, Eq. 3 illustrates that the minority/non-Hispanic white earnings gap in year t can be partitioned into two segments: differences related to the average observable characteristics between the two groups weighted by the returns accrued by non-Hispanic whites ($\Delta X_t B_t^{\text{NHW}}$) and the earnings residual for minorities based on their predicted earnings using the wage structure of non-Hispanic whites ($\sigma_t^{\text{NHW}} \Delta \theta_t$).

Following Eq. 3, changes in the minority/non-Hispanic white wage differential between two time periods ($t-1$ and t) can be decomposed into:

$$\Delta W_t - \Delta W_{t-1} = (\Delta X_t - \Delta X_{t-1})B_t^{NHW} + \Delta X_{t-1}(B_t^{NHW} - B_{t-1}^{NHW}) \\ + (\Delta \theta_t - \Delta \theta_{t-1}^{NHW})\sigma_t^{NHW} + \Delta \theta_{t-1}(\sigma_t^{NHW} - \sigma_{t-1}^{NHW}). \tag{4}$$

The first right-hand side term (the X-effect) reflects how changes in observable characteristics (such as education and geographic location) during the two time periods affected the wage differential between the minority group and non-Hispanic whites. The second element (the B-effect) accounts for changes in the *returns* to these characteristics, holding constant the differences in observable characteristics between M and non-Hispanic whites in the earlier period. The third component (the θ-effect) in Eq. 4 captures the residual earnings position of the minority group in the non-Hispanic white wage structure; i.e., where minorities fall in the non-Hispanic white earnings distribution after controlling for observable characteristics. The fourth term (the σ-effect) exposes changes in the standard deviation of residual wages evaluated at the residual earnings position of minorities in the non-Hispanic white earnings structure in the initial time period. This last term essentially measures changes in the returns to unobservable characteristics between the two time periods.

The X- and θ-effects capture the full wage effect of minority-specific factors (the effect of the differences between non-Hispanic whites and minorities with respect to observable and unobservable characteristics). Changes in the structure of wages; i.e., changes in the returns to observable and unobservable characteristics, over time are observed in the B- and σ-effects. As noted by Blau and Kahn (1997), the combination of the θ-effect and σ-effect represents the total change in the unexplained wage differential that can be estimated through traditional wage decomposition methods.

Table 3 Juhn–Murphy–Pierce wage decomposition results for changes in the earnings of Arab men relative to non-Hispanic whites between 2000 and 2002

Effect	Middle Eastern Arab men	African Arab men	Iranian, Pakistani, Afghan men
ΔW_{2000}	0.006	0.255	−0.092
ΔW_{2002}	0.212	0.015	−0.105
$\Delta W_{2002} - \Delta W_{2000}$	0.206	−0.240	−0.013
X-effect (observables)	0.029	−0.008	−0.050
B-Effect (returns to observables)	0.002	0.002	0.002
θ-Effect (unobservables)	0.172	−0.258	0.033
σ-Effect (returns to unobservables)	0.004	0.024	0.003

These results are based on US-born monolingual-English non-Hispanic white men, Arab men, and Afghan, Iranian, and Pakistani men between the ages of 25 and 40 who worked at least 20 h per week for 32 weeks or more in the previous year in the public-use microdata samples from the 2001 and 2003 ACS. Recall from Eq. 3 that $\Delta W_t \equiv \ln(W)_t^{NHW} - \ln(W)_t^M$ for non-Hispanic whites (NHW) and a minority group M in year t. See the discussion in Eqs. 2–4 in the text for more information

Table 3 provides the results from estimating Eq. 4 for Middle Eastern Arab, African Arab, and Iranian, Afghan, and Pakistani men between 2000 and 2002. The full set of regression results used to estimate the *B*'s for non-Hispanic white men can be obtained from the authors. The first two rows show that the earnings differential between Middle Eastern Arab men and non-Hispanic whites sharply widened by 0.206 log points (from 0.006 to 0.212) between 2000 and 2002; recall that Table 1 above had illustrated this wage decline. The JMP decomposition results show that only a trivial portion of this change can be explained through observable characteristics. Indeed, the impacts of unobservable characteristics, particularly the *θ*-effect, comprise the vast majority of this increase. It appears that the significant earnings decline of Middle Eastern Arab men relative to non-Hispanic whites cannot be explained by changes in either observable characteristics or in the structure of wages. We interpret this finding as additional evidence for our initial expectation: the average earnings of Middle Eastern Arab men fell after 9-11, net of confounding observable differences, suggesting a potential increase in labor-market discrimination against this group following the aforementioned terrorist attacks.

Table 3 further shows that the wage gap between non-Hispanic whites and Iranian, Pakistani, and Afghan men changed little, while the earnings gap between African Arab men and non-Hispanic whites *narrowed*, during this short time period. For the latter, the *θ*-effect represents the largest component of this change. This finding hints at the possibility that African Arab men inexplicably experienced some labor-market gains in terms of relative wages after 9-11. Perhaps employers perceive Middle Eastern Arab men and African Arab men to be substitutes in production; an increase in discrimination against populations most closely tied to the terrorist attacks (such as Middle Eastern men) could have yielded additional employment opportunities for African Arab men.

Quantile regression The prediction that the 9-11 events negatively affected the labor-market income of immigrant men from the Middle East appears to be supported by the earnings analysis above. However, it is not clear from the foregoing results whether this effect uniformly affected members of this group across the earnings spectrum. Perhaps the earnings decline among immigrant men from the Middle East only occurred among low-skill workers. For the purpose of broadening our analysis, we next explore conditional quantile regression (e.g., Koenker and Hallock 2001) to test whether Middle Eastern Arab men at the low end of the wage distribution experienced a similar earnings reduction as those at the high end following the 9-11 events.

Specifically, we estimate a series of earnings functions based on Eq. 1 for the nine earnings deciles in each year. Figs. 2, 3, and 4 display the estimates of the coefficients for the three groups of interest: Middle Eastern Arab men (Fig. 2), African Arab men (Fig. 3), and men from Afghanistan, Iran, and Pakistan (Fig. 4). The figures, for comparison, also provide the estimated coefficients for these ethnic groups obtained by OLS reported in the first three columns of Table 2 above.

These figures (particularly Figs. 2 and 4) indicate that the OLS results poorly capture the relationship between earnings and birthplace for Arab men relative to non-Hispanic whites in both years. In general, immigrant men at the lower tail of the earnings distribution earned less than non-Hispanic whites than the OLS estimates, while those in the highest earnings deciles earned more. In fact, in 2002, Figs. 2 and 4 indicate that with the exception of workers in the two lowest
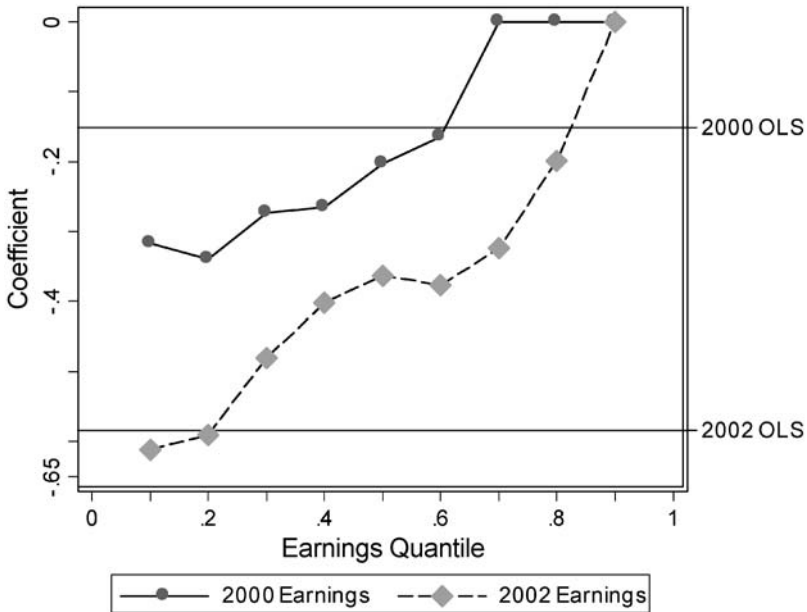
Fig. 2 Quantile regression results for the 2000 and 2002 earnings of Middle Eastern Arab men relative to US-born non-Hispanic white men. The coefficient axis measures the estimated coefficients on the Middle Eastern Arab variable from the quantile regressions. The sample includes men between the ages of 25 and 40 who worked at least 20 h per week for 32 weeks or more; the base group of comparison is US-born monolingual-English non-Hispanic white men

deciles, immigrants from the Middle East accrued smaller average earnings penalties vis-à-vis non-Hispanic white men than those captured by the OLS results for that year.

More important to this study are the systematic declines in the relative earnings of immigrant men from the Middle East in *all* of the income deciles between 2000 and 2002 (see Figs. 2 and 4). These findings echo Table 2 in that *something* dampened the earnings of younger Middle Eastern men (Arab and otherwise) relative to their non-Hispanic white counterparts in the post 9-11 US labor market. The relative earnings of African Arab men, however, did not change much between these 2 years, regardless of where they were in the earnings distribution (see Fig. 3).

Figure 2 also illustrates that the relative earnings decline for Middle Eastern Arab men during this time period was fairly symmetrical for workers across the deciles, as observed in the nearly parallel downward shift of the coefficient curve. Independent of their location in the distribution of wages, Arab men from the Middle East faced a significant earnings decline shortly after the events of 9-11. Figure 4 displays a similar pattern for the earnings of other immigrant men implicated in the 9-11 rhetoric, although the largest impact occurred for members of this group with above median wages. The quantile regression findings overall suggest a short-run labor market shock that negatively affected the labor-market outcomes of immigrant men from the geographic regions most closely associated with the public's increased awareness of the potential for terrorism.
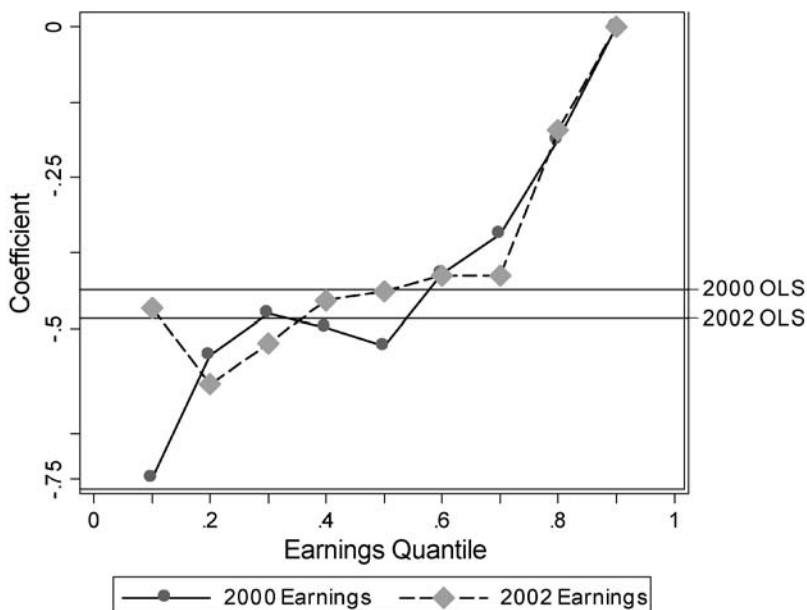
Fig. 3 Quantile regression results for the 2000 and 2002 earnings of younger African Arab men relative to US-born non-Hispanic white men. The coefficient axis measures the estimated coefficients on the African Arab variable from the quantile regressions. The sample includes men between the ages of 25 and 40 who worked at least 20 h per week for 32 weeks or more; the base group of comparison is US-born monolingual-English non-Hispanic white men

5 Concluding remarks

The results presented in this paper based on public-use microdata from the American Community Survey support the view that immigrant men most likely associated with the ethnicity of the 9-11 terrorists experienced a significant earnings decline shortly after the event. Following the discrimination theories outlined in this paper, however, it is important to note that these results likely represent short-term effects; over the long-term, discriminating employers presumably will find "paying" for misinformation and bias unprofitable.

The results also point to the apparent relationship between the visibility of Arab Americans and the extent of the earnings decline after 9-11. Arguably, their visibility has been accentuated by the media coverage associating this group with the terrorists who perpetrated 9-11. While the strength of the association between media coverage and the extent of labor-market discrimination (or other forms of biases) against Middle Eastern Arab men following 9-11 cannot be discerned by our analyses here, the results hint at the potential negative effects that media coverage on the ethnicity or religion of purported terrorist suspects might have on the earnings potential of specific populations.

Moreover, while government officials (from the US and most recently the UK after the July 7th, 2005 terrorist attacks in London) quickly responded with public statements to condemn the backlash against Arabs and Muslims, the actions of these officials could have reinforced the negative perceptions against members of
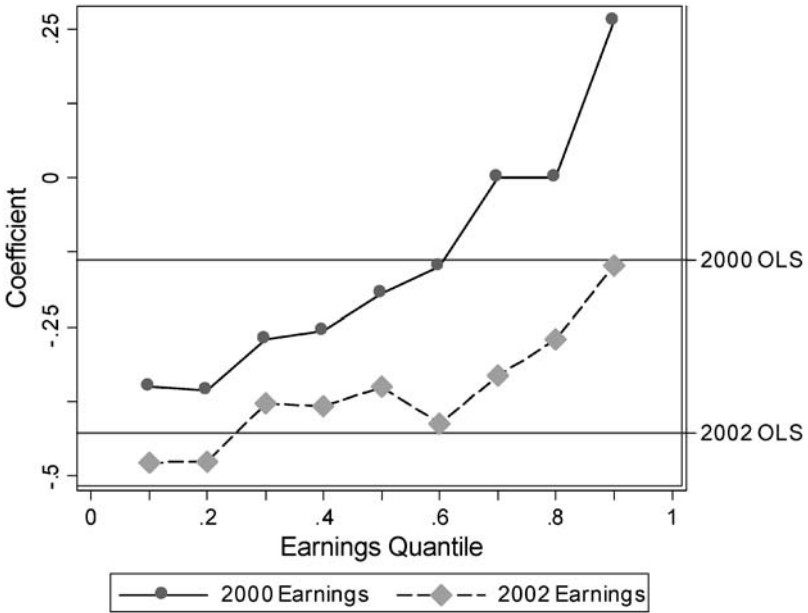
Fig. 4 Quantile regression results for the 2000 and 2002 earnings of younger Afghan, Iranian, and Pakistani men relative to US-born non-Hispanic white men. The coefficient axis measures the estimated coefficients on the "other" variable from the quantile regressions. The sample includes men between the ages of 25 and 40 who worked at least 20 h per week for 32 weeks or more; the base group of comparison is US-born monolingual-English non-Hispanic white men

these groups. Such actions included the detention of at least 1,200 individuals primarily of Arab, Muslim, or South Asian heritage because of possible terrorist ties; the directive of the Department of Justice instructing law enforcement agencies to interview of thousands of young Arab men; and the fingerprinting and tracking of visitors from certain Middle Eastern countries. Indeed, as noted by Human Rights Watch (2002), "official statements exhorting the public not to view Muslims or Arabs differently than anyone else were countered by measures taken as part of the anti-terrorist campaign that cast a cloud of suspicion over all Arabs and Muslims in the United States" (p. 27).

On a related point, our findings here suggest that the pronouncements, at least in the case of 9-11, seemingly did not eliminate labor-market discrimination against immigrant men ethnically associated with the 9-11 terrorists. Because the reported negative wage effects were strongest in states with the highest geographic densities of Arab Americans, and for the more recent immigrants, perhaps the aforementioned pronouncements would have been more effective in mitigating post-9-11 xenophobia if they had been coupled with local—and more targeted—efforts in areas with significant Arab American populations.[8]

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[8] For example, Human Rights Watch (2002) notes that working relationships and networks between local law enforcement agencies and the community enable the law enforcement to gain intelligence and quickly deploy forces into "sensitive" areas following a terrorist event, thus mitigating the potential backlash against a particular ethnic group. Moreover, individuals in communities with such relationships with local officials might feel more comfortable in reporting discriminatory acts.

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