

# **Put on ICE? Effects of Immigration Raids in the Animal Slaughtering and Processing Industry**

**Pia M. Orrenius and Madeline Zavodny**

**Abstract:** The animal slaughtering and processing industry was the epicenter of worksite immigration raids during 2006 to 2008 that were aimed at rooting out unauthorized immigrant workers in the United States. This study examines whether the industry shifted towards legal workers in the wake of the raids and whether wages, worker turnover, and other labor market outcomes changed as well. We find that the industry initially shifted towards legal foreign-born workers, particularly refugees, but the change faded over time. We also find a substantial increase in industry worker turnover but not in average wages at the national level.

# Put on ICE? Effects of Immigration Raids in the Animal Slaughtering and Processing Industry

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Debates about the quality of American jobs, the effects of immigration on less-educated U.S.-born workers and rural communities, and the security of food supply chains converge in the animal slaughtering and processing industry. Major outbreaks of COVID-19 at several meatpacking plants in 2020 brought renewed attention to those issues in the sector. The same issues were highlighted when Immigration and Customs Enforcement (ICE), a division of the U.S. Department of Homeland Security (DHS), conducted high-profile raids of meat- and poultry-processing plants in the mid-2000s and again in the late 2010s.

The ICE raids resulted in the arrest and eventual deportation of several thousand unauthorized immigrants. The raids reduced the targeted plants' workforces, at least temporarily. More broadly, the raids served notice to an industry that depended heavily on immigrant labor that the federal government was cracking down on illegal employment.

This study examines how the animal slaughtering and processing industry's workforce changed in the wake of the mid-2000s raids. We focus on changes in worker demographics at the national level and also briefly examine how industry employment, wages, worker turnover, and labor productivity changed in the aftermath of the raids.

## I. Background

The animal slaughtering and processing industry in the United States has undergone a number of notable shifts since the 1960s: from skilled butchers to low-skilled labor that performs repetitive tasks; from unionized plants in urban areas to non-union rural ones; and from white and Black U.S.-born workers to foreign-born Hispanics (Kandel and Parrado 2005). Concurrently, wages in the industry fell sharply and industry concentration rose. These changes occurred amidst rapid growth in the foreign-born population in the United States, including inflows of unauthorized immigrants from Mexico on an unprecedented scale during the mid-1990s and early 2000s.

Perceptions of widespread hiring of unauthorized immigrants in the animal slaughtering and processing sector and other low-skilled and labor-intensive industries led to a series of actions by the federal government beginning in the late 1990s. Charged with enforcing a post-1986 prohibition on hiring unauthorized workers, Immigration and Naturalization Services, the precursor to DHS, initially focused most of its efforts on examining employers' hiring records. Worksite raids were infrequent and received little public attention. But in the wake of 9/11, immigration enforcement intensified along U.S. borders and in the interior. In April 2006, DHS announced it planned to aggressively target employers that hire unauthorized immigrants, and ICE soon began a series of worksite raids that received national media attention.

Meat- and poultry-processing plants were a major target of the raids. The sector presumably was targeted since, at the time, about one in five of its workers were unauthorized immigrants (Passel 2005). The concentration of production in large rural facilities made the sector an easier target than other industries with a large share of undocumented workers, like landscaping, private households, and construction. During the period 2006 to 2008, ICE raided at least 25 meat- or poultry-processing plants. Over one-

third of administrative arrests made by ICE in fiscal year 2007 were at meat or poultry plants. Notable raids included two of the largest immigration raids in U.S. history: Operation Wagon Train, which involved simultaneous raids of six meatpacking plants in December 2006 and the arrest of almost 1,300 workers, and a raid at an Iowa slaughterhouse in May 2008 that resulted in almost 400 arrests.

Plants lost workers beyond those arrested in raids. Many unauthorized immigrants who avoided arrest because they were not assigned to work the shift when a raid occurred did not return to their jobs because they feared additional enforcement actions (Watson and Thompson 2021). One poultry plant lost 75 percent of its workforce to arrests or quits after a raid (Martin 2009). And in an effort to stave off raids, some meat and poultry plants fired employees who could not resolve discrepancies between the documents they presented showing their eligibility to work and official government records, or those workers quit when asked to resolve discrepancies. More producers enrolled in DHS programs (Basic Pilot, E-Verify, and IMAGE) aimed at weeding out hires with fake documents. In short, raided plants abruptly lost a considerable share of their workers, and the risk of an enforcement action spread to the entire industry.

Efforts to replace deported, fired, or never-returned workers after the raids and to ensure a legal workforce may have led to changes in the demographic composition of the industry's workforce. Media accounts indicate that plants began heavily recruiting refugees and U.S.-born workers, particularly Blacks, as they tried to hire legal workers. This shift may have led to higher wages since unauthorized immigrants typically earn less than other workers. However, higher costs resulting from immigration compliance may have put downwards pressure on industry wages.

The meat/poultry industry is characterized by difficult working conditions on disassembly lines, leading to high rates of worker turnover and work-related injuries and illnesses. Changes in the workforce, particularly a shift to legal workers who may have more employment options, may have pushed those rates even higher after the raids.

## II. Data and Methods

We use data from the Current Population Survey (CPS) during 1996 to 2016 to examine changes in the animal slaughtering and processing sector's workforce, focusing on race/ethnicity, nativity, and likely visa category. Using answers to questions about U.S. citizenship status and race/ethnicity, we distinguish between workers who have at most

completed high school and are white, Black, or Hispanic U.S. natives; naturalized U.S. citizens; and non-naturalized immigrants. We then use country of birth and year of U.S. arrival to distinguish between non-naturalized immigrants who are authorized to work because they are likely to be refugees, to have Temporary Protected Status (TPS), or to be beneficiaries of the 1986 or 1997 legalization programs and those who are likely to be unauthorized (see the Appendix for details).

We estimate dynamic treatment effects models looking at the share of non-white U.S. natives or immigrants in each demographic group employed in the animal slaughtering and processing sector each year. White U.S. natives serve as the control group. We treat 2006 as the time of the "event" and estimate regressions with four leads and seven lags, or

$$(1) \text{Share}_{gt} = \alpha + \sum_{j=2}^5 \beta_j (\text{Lead } j)_{gt} + \sum_{k=0}^7 \gamma_k (\text{Lag } k)_{gt} + \mu_g + \lambda_t + \varepsilon_{gt},$$

where  $g$  indexes groups and  $t$  indexes years. The estimated coefficients on the leads and lags show the evolution of the share of workers in a given group, such as refugees, employed at meat and poultry plants, relative to the share of white U.S. natives. The latter share changes little during our sample period (see Appendix).

We expect to observe that the share of non-white U.S. natives and employment-authorized

immigrants – naturalized U.S. citizens and non-naturalized refugees, TPS holders, and legalization program beneficiaries – who are working in the industry increased after the raids began in 2006. We expect to see the share of likely unauthorized immigrants working in the industry decreased.

The event study technique requires assuming that the “treatment” groups would have changed similarly to the “control” group – white U.S. natives – in the absence of the raids. The leads, or pre-trends, allow us to examine the validity of that assumption before the raids began in earnest in 2006. We focus on the share of each group employed in the meat- and poultry-processing sector since examining shares implicitly controls for any changes in group size, such as an influx of refugees.<sup>1</sup>

We use a similar model to examine changes over time in hourly compensation and labor productivity using annual data from the Bureau of Labor Statistics (BLS) and in employment levels, the hiring rate, and the separations rate using quarterly data from the Quarterly Workforce Indicators (QWI) program. When using the QWI data, we estimate 8 leads and 16 lags, with the second quarter of 2006 as the time of the event. In all of these regressions, we

examine workers in the meat/poultry industry as a whole, not by demographic group. Workers in the private sector as a whole serve as the control group.

### III. Results

The share of refugees working in the animal slaughtering and processing industry increased considerably after the raids. As panel (a) of Figure 1 shows, the share of refugees employed in the sector was significantly higher, relative to white U.S. natives, by two years after the raids began, and it rose for several years. The raw numbers tell a dramatic tale, with the share of refugees working in sector rising from below 1 percent in 2006 to almost 18 percent in 2010 (see Appendix). The share of refugees working in the sector eventually eased, but it remained above its pre-raid rate even a decade later.

The share of naturalized U.S. citizens employed in the sector also was significantly higher two years after the raids began (panel (b)), but the increase was considerably more muted than among refugees. In addition, the share of TPS holders working in the industry was significantly higher three years after the raids began (panel (c)). We do not find evidence of a significant change among IRCA

<sup>1</sup> The Appendix shows the distribution of workers in the industry across the groups we examine over time, which would capture any effects in group size.

and NACARA beneficiaries, nor among Hispanic or Black U.S. natives. The failure to find a significant relative increase among Black U.S. natives is surprising given heavy media coverage of industry attempts to recruit that group in Southern states, where African-Americans composed much of the industry's workforce before mass migration from Mexico.

The results for refugees, naturalized citizens, and TPS holders are consistent with an industry shift towards legal foreign-born workers and away from illegal ones. When we examine the relative change in the share of likely unauthorized immigrants working in the industry, however, we do not find evidence of a significant decrease. As panel (d) shows, there was little change in share of that group employed at meat and poultry plants, relative to white U.S. natives. One potential explanation for this surprising result is that the CPS data may disproportionately underrepresent unauthorized immigrants who worked in the industry. Another possibility is that legal foreign-born workers composed most of the employment growth in the industry after the raids but did not directly replace large numbers of unauthorized immigrant workers.

The raids did not have a significant impact on total employment levels in the animal slaughtering and processing sector. When we examine quarterly employment levels in the

QWI data, we do not find evidence of a significant change in employment relative to the change in the private sector as a whole (see Appendix). This null result suggests that plants were able to replace relatively easily workers lost as a result of immigration enforcement actions. However, another possibility is that multi-plant companies shifted some jobs and production from plants that experienced raids to other plants or non-raided companies expanded employment while raided ones reduced employment, leading to no change in total employment in the industry. And, of course, the QWI data only capture workers who are "on the books," although they should include anyone working under a false Social Security number. The QWI data therefore may understate any drop in employment if unauthorized immigrants left and were not replaced, but overstate any increase if legal workers replaced illegal ones.

Although employment levels did not change appreciably in the QWI data, turnover did. As shown in Figure 2, panel (a), we find a significant increase in the separations rate in the industry. The hiring rate increases as well, as shown in panel (b). Both rates peak in the second quarter of 2008, which coincides with the large raid in Iowa. The results thus indicate the industry churned through workers more rapidly in the wake of the raids.

Meat and poultry processors do not appear to have raised wages significantly even as they shifted towards legal immigrant workers and dealt with rising turnover. Annual data from the BLS do not indicate a significant change in hourly compensation relative to the private sector as a whole (see Appendix). We also find no significant relative change in real average hourly wages in the CPS data.

The lack of an increase in wages may be surprising given the difficulties the sector reportedly faced recruiting and retaining legal workers. Contemporary newspaper articles indicated that raided plants raised wages significantly in order to attract legal workers. However, the industry would have found it unprofitable to pay higher wages: Labor productivity fell in the industry relative to the private sector as a whole (see Appendix).

#### IV. Discussion and Conclusion

We find evidence that the animal slaughtering and processing industry shifted towards legal immigrant workers during the 2006-2008 worksite raids, but that shift faded over time. Employment totals and wages changed little even as turnover rose.

The industry appears to have largely returned to business as usual within a few years after tougher enforcement regime was announced. Why? After receiving much criticism from

employers and immigrant advocates and President Obama took office, DHS changed its worksite enforcement strategy from raids to audits that took several years to root out unauthorized workers (Martin 2009). The pendulum swung back when the Trump administration revived worksite enforcement, including several high-profile raids of meat- or poultry-processing plants, and back yet again when the Biden administration announced in October 2021 that it would not conduct large-scale worksite raids. The long-run and local-level impacts of raids – or lack thereof – on industries that rely heavily on low-skilled immigrant workers is a question for future research.

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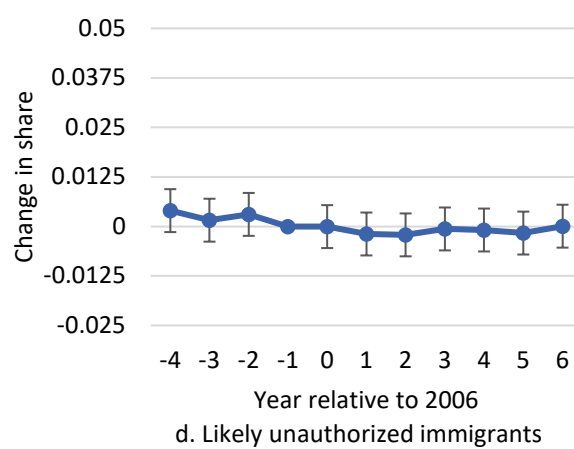
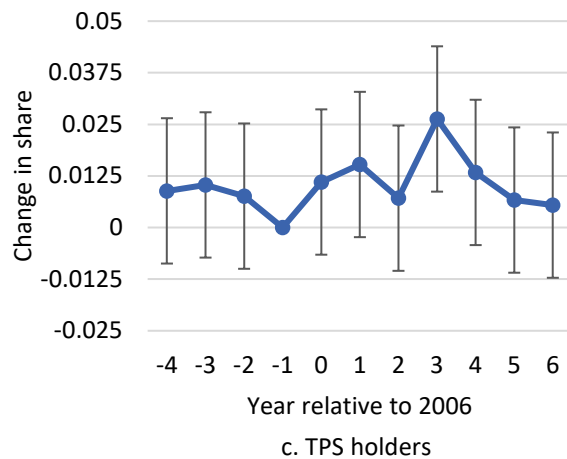
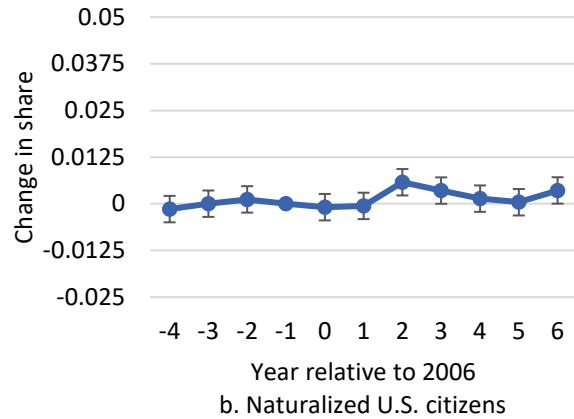
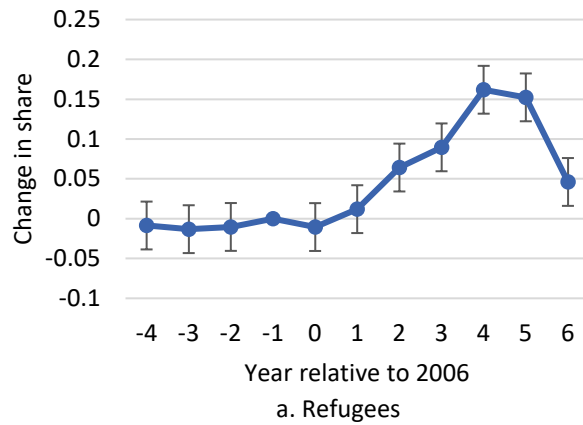


FIGURE 1. CHANGE IN SHARE OF DEMOGRAPHIC GROUP EMPLOYED IN MEAT- AND POULTRY-PROCESSING INDUSTRY

Note: Shown are estimates and 95% confidence intervals for the group indicated relative to white, non-Hispanic U.S. natives. The year 2006 is time 0 in the event studies.

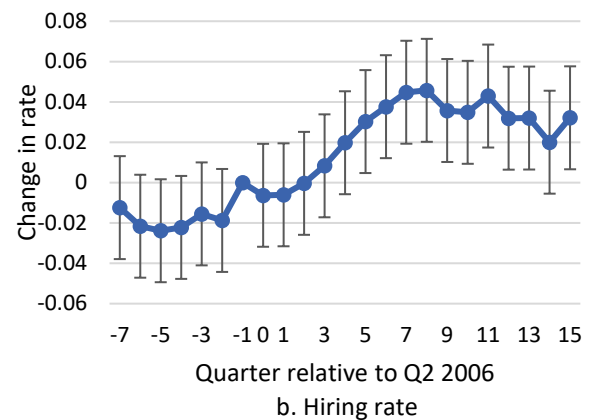
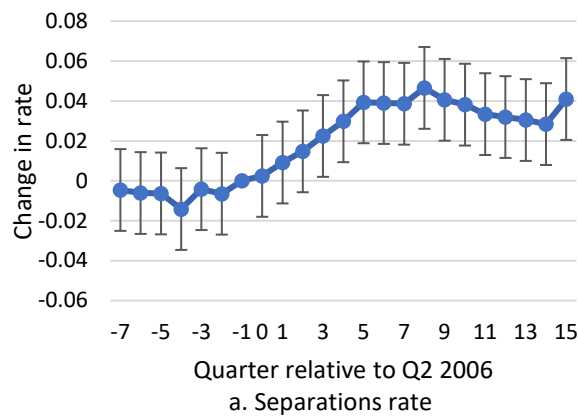


FIGURE 2. CHANGE IN SEPARATIONS AND HIRING RATES IN MEAT- AND POULTRY-PROCESSING INDUSTRY

Note: Shown are estimates and 95% confidence intervals for the rate indicated relative to the private sector as a whole. The second quarter of 2006 is time 0 in the event studies.



# **“Put on ICE? Effects of Immigration Raids in the Animal Slaughtering and Processing Industry”**

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## **Online Appendix**

Our descriptions and counts of raids and arrests in the animal slaughtering and processing industry are based on coverage of immigration enforcement actions in major U.S. newspapers. Specifically, we searched Factiva.com, a comprehensive news resource from Dow Jones, for all articles in the top 15 circulating U.S. newspapers that included any of the following terms during the period 2004 to 2016: Immigration and Customs Enforcement or ICE; audit, inspect, raid, sweep, crackdown, enforcement surge, workplace enforcement, worksite enforcement; workplace, worksite, employer, company, companies, work place, worksite; undocumented or illegal and worker, immigrant, immigration, alien, hire, or employee. Bruno (2015) reports a count of administrative arrests in worksite enforcement operations by fiscal year that serves as our denominator for calculating the share of administrative arrests that occurred in the animal slaughtering and processing industry during fiscal year 2007.

## **Data and Methods**

*Current Population Survey:* Our CPS sample is all people currently employed in the private sector who have at most completed high school. We exclude workers who do not report an industry or who work for the government/military.

We categorize non-naturalized immigrants as likely refugees (or asylees) based on their year of entry and country of birth as reported in the CPS. Following Bollinger and Hagstrom (2008, 2011), we categorize non-naturalized immigrants as refugees if at least half of people receiving legal permanent residence in their country-of-birth-by-period-of-entry cohort were refugees or asylees, according to INS/DHS data.

We categorize non-naturalized immigrants as likely Temporary Protected Status (TPS) holders based on their reported year of entry and country of birth and whether TPS was in place in a given year for immigrants from that country-by-period-of-entry cohort. See Wilson (2021) for details about the TPS program and Orrenius and Zavodny (2015) for discussion of the effects of the program on labor supply.

We categorize non-naturalized immigrants as likely beneficiaries of the 1986 Immigration Reform and Control Act (IRCA) or 1997 Nicaraguan Adjustment and Central American Relief Act (NACARA) legalization programs if they report entering the U.S. before 1982 for IRCA or 1990 (and from an eligible country: El Salvador, Guatemala, Nicaragua, and the USSR/Soviet Bloc) for NACARA.

All other non-naturalized immigrants are categorized as likely unauthorized immigrants. Again, our sample is limited to private-sector workers who have at most a high school diploma.

The CPS data are from IPUMS (Flood et al. 2021). We use person weights throughout the analysis.

*Quarterly Workforce Indicators:* We collapse state-level data on employment, hires, and separations for all states with data available for the animal slaughtering and processing industry and the private sector as a whole for each quarter from the fourth quarter of 2003 through the second quarter of 2016; this results in AK, AZ, DC, and MA being excluded from the sample. We seasonally adjust the data. We create hiring and separations rates as the sum across states of all hires or separations divided by the sum across states of the average of beginning-of-quarter and end-of-quarter employment. The data are from <https://lehd.ces.census.gov/data/#qwi>.

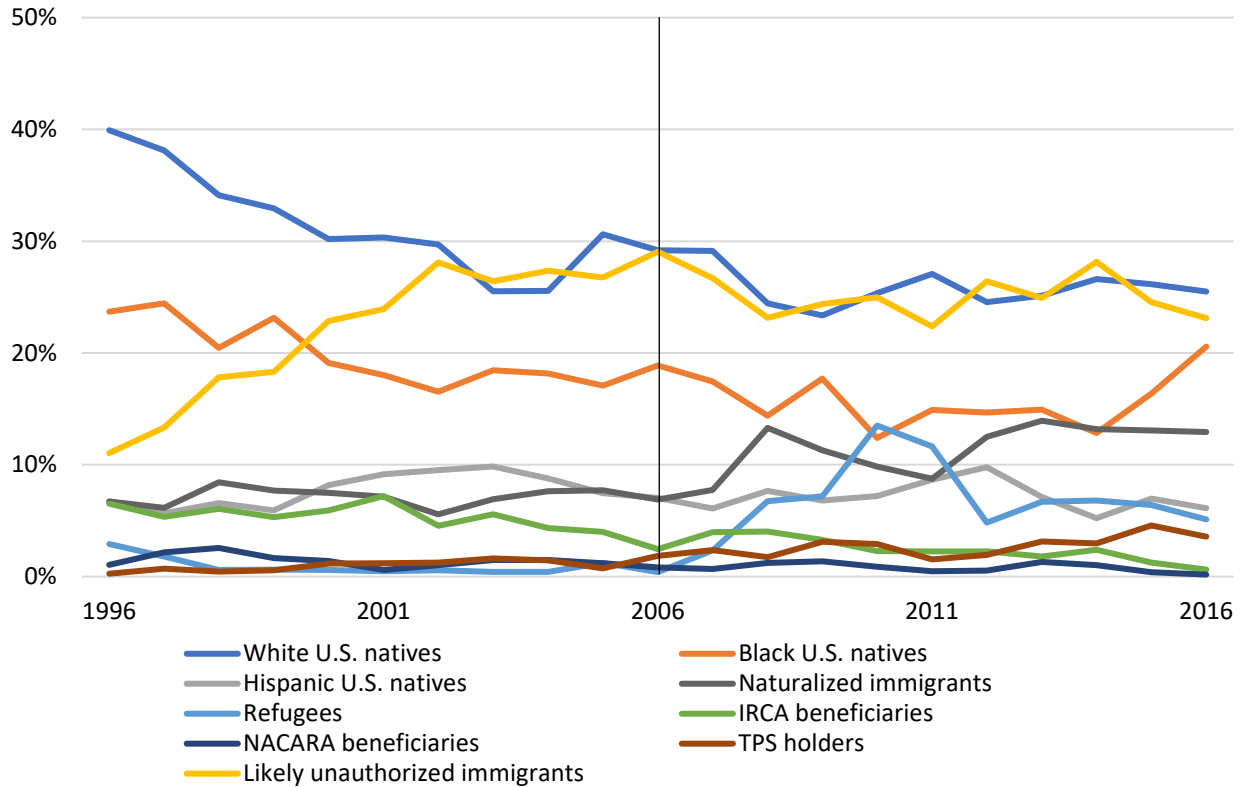
*BLS data on hourly compensation and labor productivity:* We use annual data on hourly compensation and labor productivity for the animal slaughtering and processing sector and the private sector as a whole for 1996 to 2016. Each data series is reported as an index (with 2007 = 100), so we examine growth rates rather than levels. The data are from <https://www.bls.gov/lpc/>.

When estimating the dynamic treatment effects models, we combine (or “bin”) the endpoints and do not show them in the figures. The period before the event is the omitted (baseline) period in the event study models.

## Results

Appendix Figure 1 shows the distribution of less-educated workers in the meat- and poultry-processing sector across the demographic groups we examine, by year. We focus on post-2006 trends. There is a noticeable increase in the share of workers in the industry who are refugees after 2006 (shown in light blue). There is also an increase in the share of workers who are naturalized immigrants (darker gray). Those increases are offset by decreases in the share of workers who are likely unauthorized immigrants (yellow), white non-Hispanic U.S. natives (the highest initial share, in medium blue), and Black non-Hispanic U.S. natives (orange). The decreases for white and Black U.S. natives are continuations of ongoing negative trends; the decrease for likely unauthorized immigrants is a reversal in the trend. We also observe a decline in the share who are IRCA beneficiaries (green), which may be due in part to those workers reaching retirement age or becoming naturalized U.S. citizens. Such concerns about changes in labor force composition motivate our focus in the paper on the share of workers in a demographic group who are employed in the sector rather than on the share of workers in the sector who are in a demographic group.

**Appendix Figure 1: Distribution of Less-Educated Meat and Poultry Plant Workers across Groups, 1996-2016**

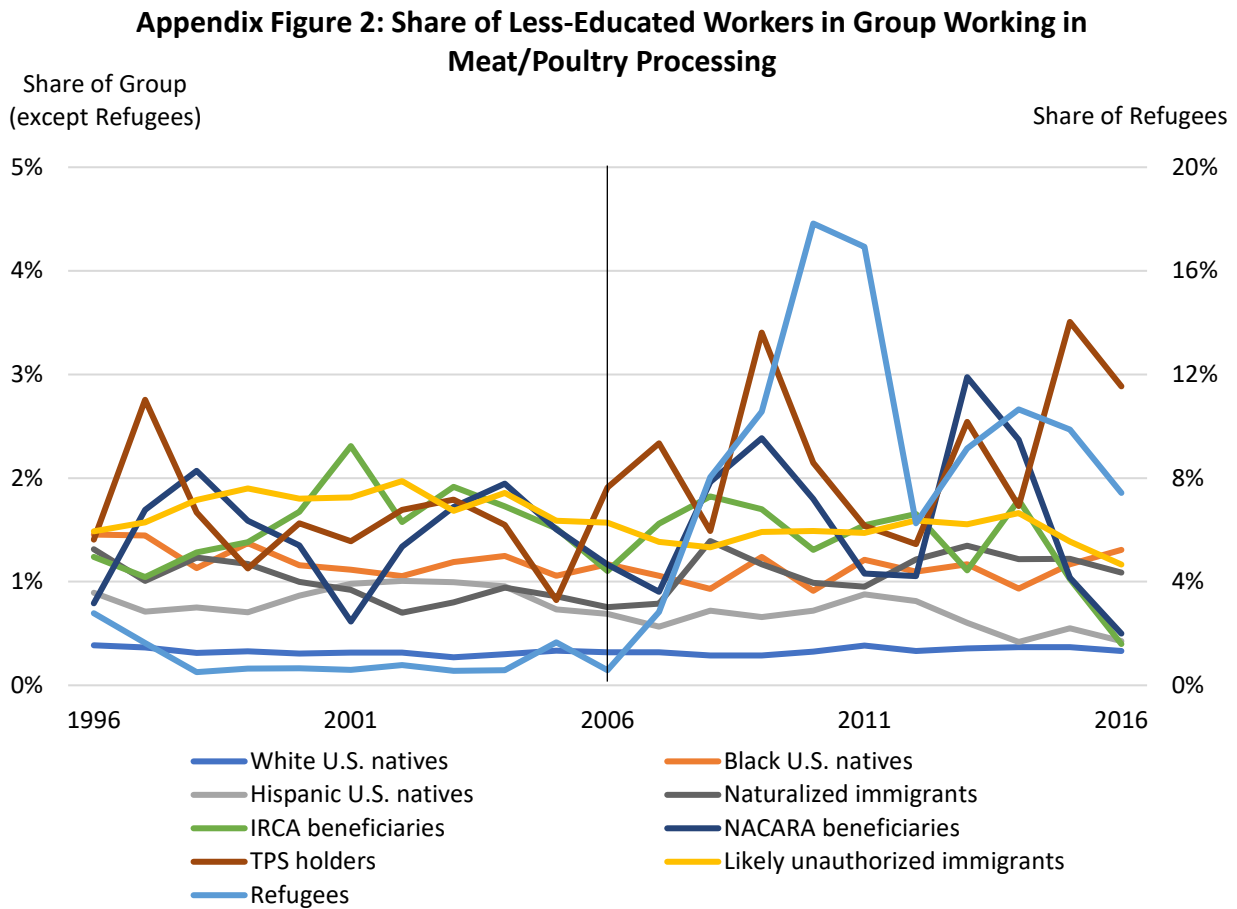


Note: Calculations based on CPS data.

Appendix Figure 2 shows the share of less-educated workers in each demographic group who are employed in the meat- and poultry-processing sector. These shares underlie the dynamic treatment effects analysis we report in the paper.

The most dramatic change is among refugees, so much so that their share in the sector is measured on the right-hand vertical axis. The share of refugees (lighter blue line) working in the industry increases dramatically between 2006 and 2010. The shares of TPS holders (brown line) and NACARA beneficiaries (dark blue) working in the industry are more volatile, which is not surprising given the smaller sizes of these groups, but appear to generally increase after 2006. The share of naturalized immigrants (darker gray) also tends to be higher after 2006. The share of likely unauthorized immigrants (yellow) working in the sector appears to fall, but the decline starts as early as 2005, before the raids began in earnest. The share of white non-Hispanic U.S. natives (medium blue) employed in the industry – the control group in the event

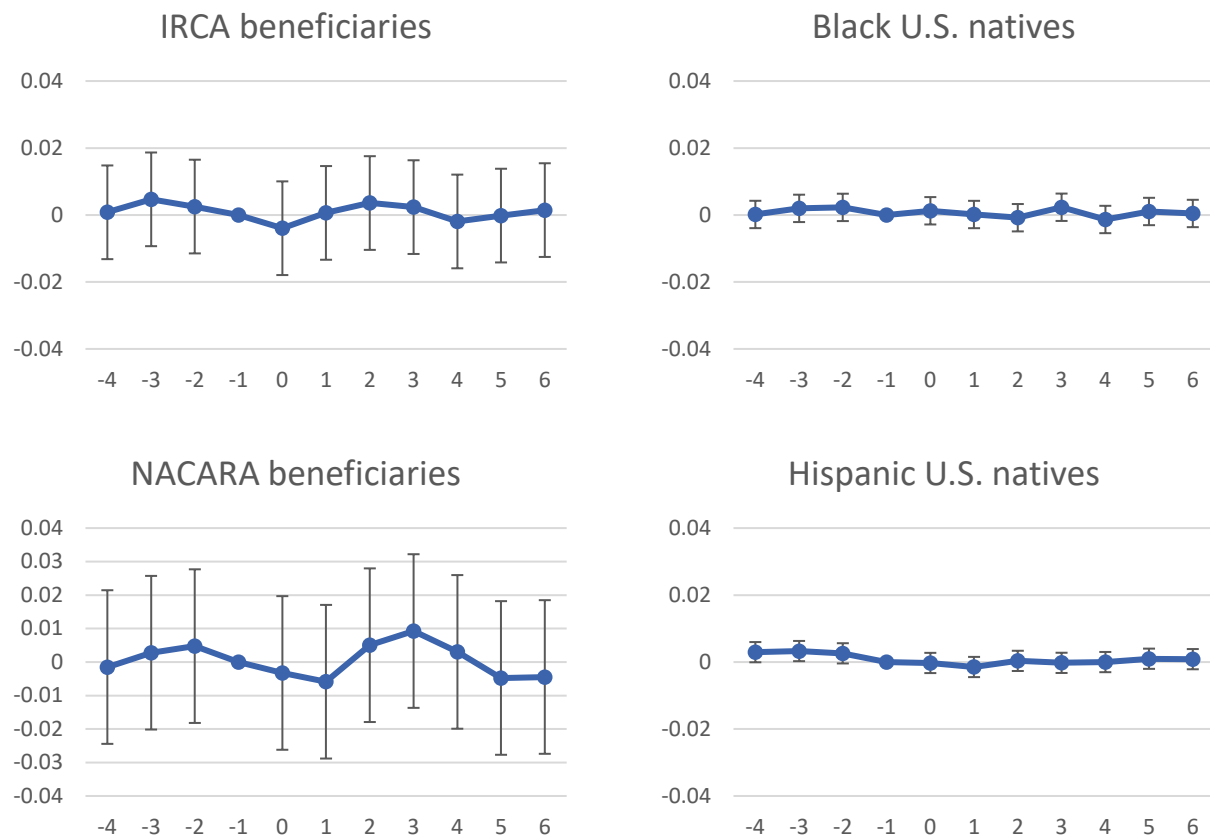
studies – is virtually unchanged.



Note: Calculations based on CPS data.

The article shows the event study results for demographic groups with a meaningful change in their share in the industry relative to white non-Hispanic U.S. natives and for likely unauthorized immigrants since they are the focus of the raids. Appendix Figure 3 shows the event study results for the other demographic groups for completeness.

**Appendix Figure 3: Event Study Estimates for Share of Other Demographic Groups Employed in the Meat- and Poultry-Processing Industry**



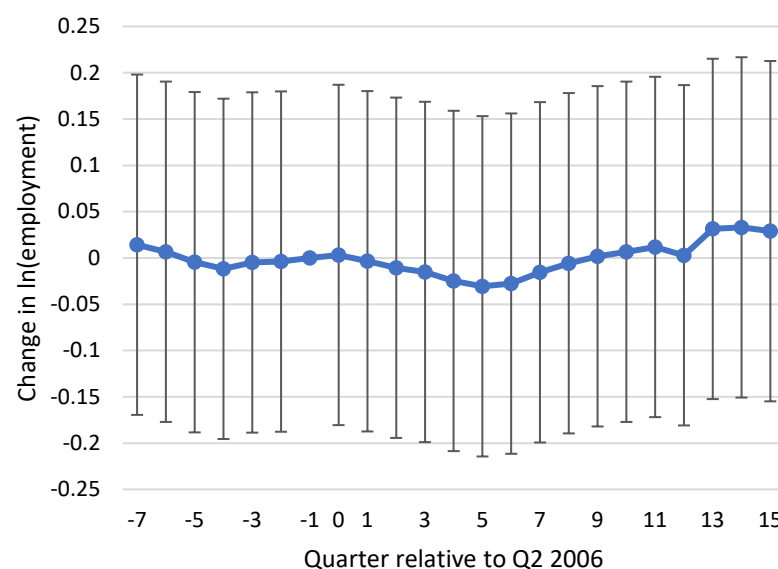
Note: Calculations based on CPS data.

There is little change in the share of IRCA beneficiaries working in the industry, relative to the change among white non-Hispanic U.S. natives. There may be an increase in the share of NACARA beneficiaries working in the industry, given the pattern in their figure above, but it is not statistically significant. The sample – and the population – of NACARA beneficiaries is small, making it difficult to detect any change among that group. We obtain precisely estimated null results for Black and Hispanic U.S natives.

As noted in the article, we do not find a significant change in average employment after the raids. Appendix Figure 4 shows the event study results for average employment in the

animal slaughtering and processing industry relative to the private sector as a whole. We obtain similar null results when using beginning-of-quarter employment or end-of-quarter employment (not shown). We also obtain results similar to Figure 2 in the article when examining the  $\ln(\text{hiring rate})$  and  $\ln(\text{separations rate})$  or the  $\ln(\text{count of hires})$  and  $\ln(\text{count of separations})$  instead of the levels of the hiring and separations rates (not shown).

**Appendix Figure 4: Event Study Estimates for Employment in the Meat- and Poultry-Processing Industry**

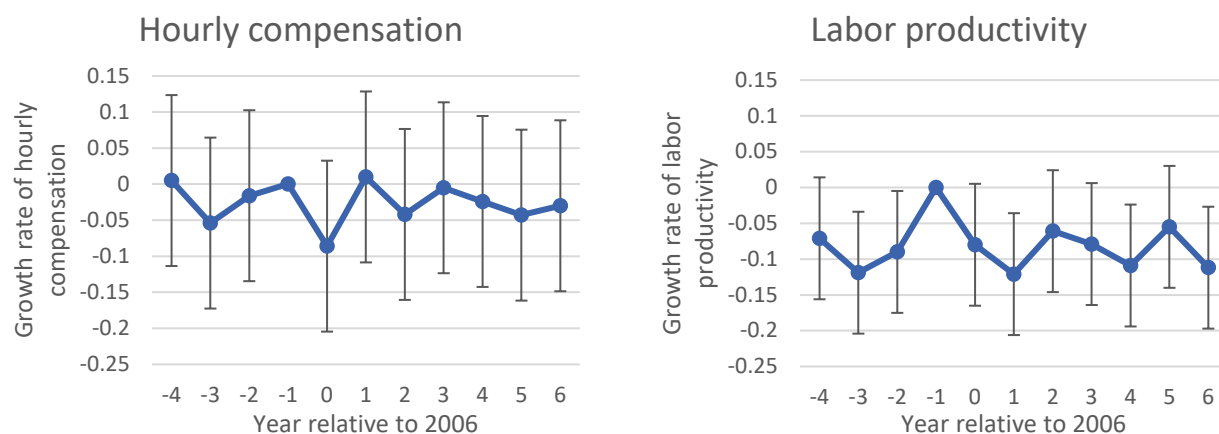


Note: Calculations based on QWI data.

Lastly, we examine the growth rates of hourly compensation and labor productivity in the animal slaughtering and processing industry compared with the private sector as a whole. As Appendix Figure 5 shows, the growth rate of hourly compensation does not change significantly in the industry, relative to the private sector as a whole, after the raids began. (In results not shown here, we obtain similar null results in the CPS when looking at real hourly wage levels, both in the raw data and when looking at wage residuals after controlling for age,

sex, education, and nativity/race/ethnicity.) The growth rate of labor productivity is significantly lower in the industry than in the private sector as a whole, but this may be a continuation of pre-2005 trends. We also find no significant change in employment in these annual data (not shown), similar to the null result in the quarterly data from the QWI.

**Appendix Figure 5: Event Study Estimates for Hourly Compensation and Labor Productivity Growth in the Meat- and Poultry-Processing Industry**



Note: Calculations based on BLS LPC data.

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