The Differential Incidence and Severity of Food Insecurity by Racial, Ethnic, and Immigrant Groups over the Great Recession in the U.S.

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A food insecure household has difficulty providing enough food for all their members from a lack of resources (Schanzenbach et al., 2016). Perennially, black- and Hispanic-headed households have higher rates of food insecurity (e.g., 21.5% and 19.1% in 2015, respectively) than the national average (12.7% in 2015) (Coleman-Jensen et al., 2013; Coleman-Jensen et al., 2014; Coleman-Jensen et al., 2015). Minority groups have received considerable attention from policymakers and academics since they have higher rates of poverty and use public programs at rates greater than the majority populations (e.g., Currie, 2003; Jensen, 2002; Ratcliffe, 2015). Food insecurity is a likely contributing factor to the disadvantage of those groups (Coleman-Jensen et al., 2013; Coleman-Jensen et al., 2015; Ratcliffe, 2015). Therefore, a better understanding of these groups concerning their exposure to food insecurity and how public programs potentially aid them can suggest ways to orient those public programs to these groups more effectively.

Though the literature on food insecurity is extensive (Gundersen et al., 2011; Ratcliffe et al., 2011; Wilde and Nord, 2005), no research provides a nationally-representative picture of the incidence and severity of food insecurity by households of different races/ethnicities and immigrant status. Typically, researchers use demographic variables as controls where they are not the primary focus of analysis. Much of this research has focused on the role that the Supplemental Nutritional Assistance Program (SNAP) has on food insecurity or the effect of food insecurity on health outcomes. At the same time, most existing studies focus on the *incidence* of food insecurity with a binary indicator, while the *severity* of that exposure has been largely ignored, a point made by Gundersen et al. (2011). As we show below, groups that have a higher incidence of food insecurity do not necessarily have a higher severity of food insecurity.

This paper begins to address these issues. First, we examine two measures of food-related hardship: *incidence*, which captures whether households are food insecure (the traditional binary measure); and *severity*, based on a continuous measure described below. Second, we document the differences in food insecurity incidence and severity across groups defined by race/ethnicity and immigrant status before, during, and after the Great Recession (GR). Third, we employ decomposition analysis to assess the contribution of compositional and structural factors to the observed differences in food insecurity incidence and severity for the different demographic groups over time. Lastly, we analyze the role of SNAP participation on food insecurity incidence and severity (and their decompositions), accounting for the endogeneity of SNAP take-up.

I. Data and Measures of Food Security

We analyze data from the Food Security Supplement (FSS) in the Current Population Survey (CPS). These data are nationally representative of the U.S. population, spans the Great Recession, and comprises several observations that allow analyzing, with acceptable precision, the food insecurity exposure of the groups of interest. The FSS is the official source of national statistics. The U.S. Department of Agriculture (USDA) uses 18 or 10 questions from the FSS to construct a scale score to determine the food security status of households with or without children (Gundersen et al., 2011; Hamilton et al., 1997; Opsomer et al., 2002; USDA, 2001). This scale score is a nearly continuous measure resulting from fitting a single-parameter Rasch model to the food security questions in the FSS. Based on this measure, the USDA divides households into four groups: high food secure, marginally food secure, low food secure, and very low food secure (Gundersen et al., 2011; Hamilton et al., 1997; Opsomer et al., 2002; USDA, 2001). Households in the latter two groups are deemed food insecure and define the widely employed binary measure of *incidence*. The Rasch scale score is considered a measure of the *severity* of exposure to food insecurity (Hamilton et al., 1997; Opsomer et al., 2002; USDA, 2001), and we use it as such.

We employ two samples for our analyses below. To analyze the incidence measure, we focus on "households below 185% of the poverty line or short of money for food," which is the target population of the FSS. To analyze the severity measure, we focus on households with a Rasch scale score greater than zero (marginally food secure or worse), since all households with high food security (regardless of how well-off they are) receive a score of zero. Comparison of the two samples reveals that, while the latter has higher mean food insecurity incidence and SNAP participation, they are very similar in terms of other observable characteristics, since both samples pertain to comparably disadvantaged households.

II. Analysis of Food Insecurity Incidence and Severity

We consider periods before (2003-2006), during (2007-2009), and after (2010-2011) the Great Recession (GR).[1] Figures 1 and 2 show the raw group differences by race/ethnicity and immigrant status in food insecurity incidence and severity. Figure 1 shows that blacks and Hispanics have higher incidence on food insecurity relative to whites, and immigrants over nonimmigrants, in each of the three periods considered, as expected. The mean difference in incidence for blacks relative to whites decreased by 1.45 percentage points (pp) during the GR and further decreased by 1.38 pp in the post-GR period. In contrast, the difference in the mean incidence increased for Hispanics relative to whites by 2.49 pp during the GR while subsequently decreasing by 1.61 pp in the post-GR period. A similar pattern can be seen for immigrants relative to nonimmigrants, with an increase of 1.86 pp during the GR and a decrease of 0.99 pp in the post-GR period.

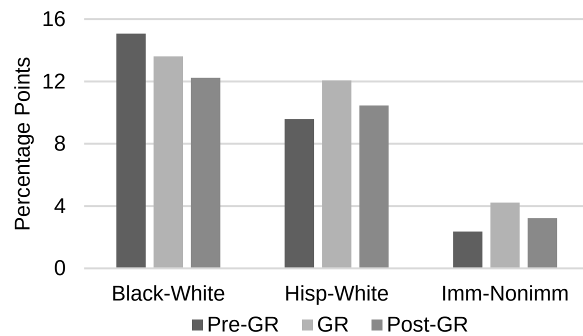

FIGURE 1. RAW DIFFERENCES IN FOOD INSECURITY INCIDENCE

A different story is seen when considering the severity of exposure to food insecurity in Figure 2. To ease interpretation, we have standardized the scale score to have zero mean and unit standard deviation. The mean differences in severity between Hispanics and whites are essentially non-existent. Notably, immigrants face lower food insecurity severity than nonimmigrants (by about 4 percent of a standard deviation), and this changed little over the periods under consideration. Conversely, blacks observe higher severity exposure to food insecurity relative to whites, which is in line with their results for incidence. The black-white difference in severity exposure is 12 percent of a standard deviation before and after the GR, while this difference decreased to 9 percent during the GR. The disparate patterns

[1] We could use two more years of CPS data in the post-GR period. However, the instruments we employ in the next section are available to us until 2011. Thus, for comparability with the subsequent analysis, we define the post-GR period as ending in 2011 throughout the paper.

in food insecurity incidence and severity for some groups offer new insights and suggest that the disadvantaged groups with higher severity exposure are not necessarily those with higher incidence of food insecurity.

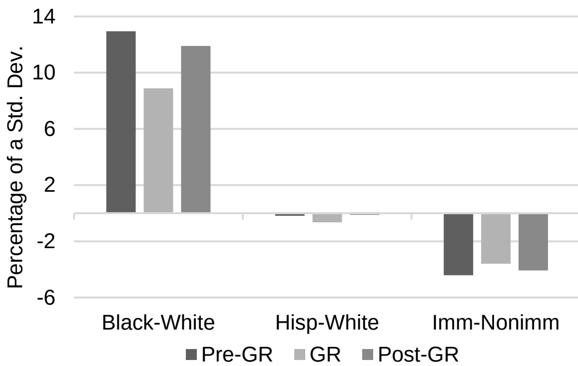

FIGURE 2. RAW DIFFERENCES IN FOOD INSECURITY SEVERITY (STANDARDIZED RASCH SCORE)

Using the same groups and time periods, we conduct a decomposition analysis (Fortin et al., 2011) to assess the contribution of factors to the observed differences in food insecurity incidence and severity. Those factors are an "endowment component" attributable to group differences in observable household characteristics,[2] and a "structural component" attributable to group differences in the structure linking the observable household characteristics to food insecurity (i.e., the regression coefficients). For the decomposition by race/ethnicity we regard whites as the reference group, while we regard non-immigrants the reference group in the analysis by immigration status. We summarize the main findings here and make available online the complete set of results. First, the decomposition of mean differences in food insecurity incidence shows that both the endowment and structural components contribute to Hispanic-white and black-white differentials, with the structural component being somewhat more important for the black-white difference. Meanwhile, all of the difference in incidence between immigrants and nonimmigrants is explained by the endowment component. No dramatic changes in the relative importance of these components occur over our time period. Second, the decomposition analysis of differences in severity reveals that the black-white differential, which followed a similar pattern to food insecurity incidence for these groups, is primarily explained by the endowment component. In contrast, the structural component is relevant for the periods pre- and post-GR, but not in the intervening period. For the immigrant-nonimmigrant difference in severity (which reversed sign relative to the difference in incidence), the magnitude of the structural component is larger, although none of the components is statistically significant.

[2] We include a wide array of observable household characteristics available in the CPS: age, its square and cube, gender, race, ethnicity, immigration status, marital status, urban status, employment status, whether the respondent is the household head, its interaction with employment, number of children, family size, education, family income, census region fixed effects, and year fixed effects.

While coarse, the decomposition analysis is suggestive of the heterogeneity in the relative importance of the factors (endowments and structure) contributing to the observed differences in food insecurity incidence and severity across these demographic groups over the GR.

III. The Role of SNAP Participation

One possible explanation to the differences in food insecurity incidence and severity in the groups analyzed is that they may participate in SNAP at different rates. We analyze this possibility by extending the decomposition analysis adding a variable indicating SNAP participation. If relevant, we expect that the inclusion of SNAP participation would change the previously documented results.

In general, the decision to participate in SNAP is made endogenously. To address this endogeneity, we use instrumental variables (IVs) in the decomposition analysis that exploit differences in the state-specific rules of the SNAP program, as in Ratcliffe et al. (2011).[3,4] The results, available in the online material, show that the inclusion of SNAP participation does not result in fundamental changes to the results of the previous section, except for a few exceptions.[5] Two exceptions in the decomposition of the observed group differences in incidence are as follows. The inclusion of SNAP shifts the relative importance of the components in the black-white difference before and during the GR heavily towards the structural component. Conversely, for the Hispanic-white difference after the GR, it shifts the relative importance heavily towards the endowment component. There are also two exceptions in the decomposition of the observed group differences in severity. First, the inclusion of SNAP heavily changes the relative importance towards the structural component in the black-white difference prior to the GR. Second, in the pre-GR period, the relative importance of the components in explaining the immigrant-nonimmigrant severity difference is swayed toward the structural component. Aside from those exceptions, it appears that SNAP participation is not a driving force in the

[3] We employ the following IVs for SNAP participation: use of biometric technology, outreach spending per capita, broad based categorical eligibility, use of the Combined Application Project, and comparable disqualifications. The source of these variables, which were chosen based on their instrument relevance, is the SNAP Policy Database maintained by the USDA.

[4] An alternative set of IVs we could use are those based on household's simulated eligibility as a function of its characteristics and place of residence, as in Schmidt et al. (2016). We found similar results as those reported here using the specific sample and IVs from Schmidt et al. (2016), which also allows controlling for eligibility to other safety-net programs. We thank those authors for graciously sharing their data with us.

[5] The IVs we employ satisfy the relevance condition in our setting. The (conditional) exogeneity of the IVs is predicated on the differences in the administration and regulation of SNAP across states being likely exogenous to household's exposure to food insecurity. For an extended discussion of this and an indirect assessment see Ratcliffe et al. (2011).

documented differences across the demographic groups over the GR.[6]

IV. Discussion and Conclusion

We analyze the differential exposure to food insecurity incidence and severity over the GR of important race and ethnicities, and groups defined by immigrant status. Our results show that blacks and Hispanics have higher food insecurity incidence than whites, and immigrants have higher incidence than nonimmigrants. During the GR, the inequality in food insecurity incidence between Hispanics and whites and immigrants and nonimmigrants increased, but the inequality between blacks and whites fell. Contrary to the mean differences in incidence, the mean differences in severity are insignificant between Hispanics and whites, and immigrants face significantly lower food insecurity severity than nonimmigrants. In contrast, blacks observe higher food insecurity severity relative to whites, in line with their results for food insecurity incidence. These results show the importance of examining both the extensive (incidence) and intensive (severity) margins of food insecurity exposure to obtain a more complete picture of food insecurity across these groups. It was also uncovered that the raw differences between groups are driven, to some extent, by the observable characteristics of their members. However, many of these differences are also driven in considerable part by the structural (and unobserved) component of the decomposition. Lastly, we document that the main policy lever to fight exposure to food insecurity does not fundamentally change the patterns documented when ignoring its role.

We view these results as the necessary first step of uncovering the existing heterogeneity in exposure to food insecurity (both in incidence and severity) over the demographic groups under consideration. There are many questions left unanswered here, some of which we are pursuing in related work. For instance, it is important to gain a better understanding of the specific determinants of the differential incidence and exposure to food insecurity by the different groups, including those that are behind the structural component parsed out here. Moreover, a closer examination of the role played by SNAP and the potentially different determinants of program participation by groups can shed additional light on the matter. To answer those important questions, a structural model of exposure to food insecurity

[6] We note that a handful of the decomposition estimates shown in the online material lose statistical significance when including and instrumenting for SNAP participation. In most cases, however, the magnitude of those coefficients is similar across models, and a test of their equality would not be rejected.

and the pathways that SNAP and other safety-net programs affect exposure by the different groups appears as a promising tool.

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