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ABSTRACT

This paper studies how government transfers respond to changes in local economic activity that emerge during recessions. Local labor markets that experience greater employment losses during recessions face persistent relative decreases in earnings per capita. However, these areas also experience persistent increases in transfers per capita, which offset 16 percent of the earnings loss on average. The increase in transfers is driven by unemployment insurance in the short run, and medical, retirement, and disability transfers in the long run. Our results show that nominally place-neutral transfer programs redistribute considerable sums of money to places with depressed economic conditions.

JEL Classification Codes: E32, H50, R12, R28

Key Words: recessions, safety net, government transfers, demand shocks, local labor markets, event study

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1 Introduction

While economists have traditionally expressed skepticism about place-based policies, a growing literature revisits both the efficiency and equity consequences of targeting transfers to specific places (e.g., Austin, Glaeser and Summers, 2018; Fajgelbaum and Gaubert, 2020; Gaubert, Kline and Yagan, 2021). Examples of policies intended to improve economic conditions in specific areas include targeted employment subsidies to workers or firms (e.g., Busso, Gregory and Kline, 2013) and block grants to local communities (e.g., Bartik, 2020). While the United States spends about $300 billion per year on place-based government transfers, a far greater amount—over $3 trillion—is spent on person-based transfers.[1] However, many of the person-based transfers depend on individuals' employment and earnings, so policies that nominally are place-neutral could provide additional resources to areas that experience adverse economic conditions. The place-specific consequences of landmark transfer programs thus inform the effectiveness of social insurance programs and the optimal design of supplementary place-based policies.

This paper investigates the response of the social safety net to place-specific shifts in economic activity arising from recessions over 50 years.[2] Specifically, we study how per-capita earnings and government transfers evolve in metropolitan areas where national recessions are more versus less severe. We draw upon multiple data sources, including those from the U.S. Bureau of Economic Analysis, the Census Bureau, and the Social Security Administration, to create annual panels of longitudinally harmonized geographic areas stretching over five decades. We estimate event study models that relate the evolution of income measures to sharp employment changes during recessions, while controlling for prerecession trends in population growth.

Our focus on recessions is motivated by two main considerations. First, the response of the

[1] Both figures are for 2019. The source for the first number is Dilger and Cecire (2019), which we adjust to remove pass-throughs to individuals for Medicaid/CHIP and Temporary Assistance For Needy Families, and that for the second is our data, which we describe below.

[2] These recessions took place from 1973–1975, 1980–1982 (we pool the very short recession in 1980 with the longer one in 1981–1982), 1990–1991, 2001, and 2007–2009.

safety net to recessions is of central importance to policymakers and researchers (e.g., Moffit, 2013; Bitler and Hoynes, 2016; Bitler, Hoynes and Kuka, 2017*a*). Second, recessions lead to persistent declines in economic activity in areas that experience more severe employment losses (Hershbein and Stuart, 2021). The lasting effects of recessions on local economic activity allow us to identify the response of the safety net to persistent changes in economic opportunity, which has been the focus of much recent work (e.g., Austin, Glaeser and Summers, 2018).

We find that person-based transfer programs generate a substantial amount of place-based redistribution. In particular, local labor markets that experience more severe employment losses during a recession face lasting reductions in employment and earnings per capita, but they also receive lasting increases in transfers per capita. Our estimates imply that a metro area experiencing a 5 percent greater employment loss during a recession has total transfers per capita 2.4 percent higher nearly a decade after the national recession trough. Simple calculations imply that a metro area with the median population (about 265,000 residents) that experiences a 5 percent greater employment loss during the recession receives about $630 million more in transfers during the first 10 postrecession years. For a metro area at the 90th percentile of the population distribution (with 1.86 million residents), the increase in transfers in response to a 5 percent greater employment loss is over $4.4 billion. While sizable, the elevated transfers replace only 16 percent of the long-term decline in earnings per-capita on average.

Our data permit us to examine which types of transfers respond, both immediately in the wake of the recession and over the next several years. By design, unemployment insurance (UI) responds immediately and then fades away. Medicaid, Medicare, and Social Security (which includes retirement and disability insurance) account for nearly all of the long-run increase in transfers per capita. Income maintenance transfers also show a sustained rise, but the magnitudes are small because these programs account for only 10 percent of total transfers.[3] Education and training transfers account for a negligible share of the total transfer response.

[3] Income maintenance transfers include Aid to Families with Dependent Children (AFDC) and its post–welfare reform successor, Temporary Assistance to Needy Families (TANF); Food Stamps and its successor, the Supplemental Nutrition Assistance Program (SNAP); Supplemental Security Income (SSI); the Earned Income Tax Credit (EITC); and a few others.

Because we examine the response of transfers at the local labor market level, changes in the composition of residents could explain postrecession changes in transfers. We find that recessions differentially shift the age structure of harder-hit areas, making them older, and that these shifts can explain substantial shares of the long-term increases in transfers. In contrast, changes in the age structure explain much less of the impacts of recessions on earnings per capita.

Our paper contributes to several strands of literature regarding local labor markets, the long-term impacts of recessions, and the efficacy of the social safety net. The first strand consists of many studies of the impacts of demand shocks on local labor markets (e.g., Bartik, 1991; Blanchard and Katz, 1992; Bound and Holzer, 2000; Bartik, 2015; Amior and Manning, 2018; Austin, Glaeser and Summers, 2018; Yagan, 2019; Hershbein and Stuart, 2021). These papers focus on earnings and employment, with little exploration of the social safety net. An important exception is Notowidigdo (2020), who studies the degree to which transfers explain lower mobility responses of less-skilled workers to declines in local labor demand over 10-year periods.[4] We contribute to this literature by examining how a comprehensive set of transfer programs respond to recessions at the local labor market level, exploiting shocks that span nearly 50 years.

The second related strand of literature focuses on the responsiveness of transfers to negative economic shocks, often using geographic variation (e.g., Hoynes, Miller and Schaller, 2012; Bitler and Hoynes, 2016; Bitler, Hoynes and Kuka, 2017*a*,*b*; Moffitt and Ziliak, 2020). These papers concentrate on short-term countercyclical responses rather than longer-term effects. Closely related previous research finds that local economic conditions influence Social Security Disability Insurance, Supplemental Security Income, and cash welfare (Black, Daniel and Sanders, 2002; Autor and Duggan, 2003; Black, McKinnish and Sanders, 2003; Charles, Li and Stephens, 2018). Relative to this literature, we examine a broader set of transfers, geographies,

[4] Additionally, Yagan (2019) examines how local demand shocks during the Great Recession affected individuals' receipt of Social Security Disability Insurance (SSDI). His finding of an insignificant impact on individuals' receipt of SSDI differs from our finding of a significant increase in local areas' SSDI receipt. These results underscore the difference in our approaches: we are interested in impacts on local labor markets, while Yagan (2019) estimates impacts on individuals. East and Simon (2020) focus on how individual-level shocks due to job loss affect transfer receipt.

and years, and we highlight that the means-tested programs previously studied do not make up the bulk of transfer dollars over the longer term. Our work is similar to Deryugina (2017) in examining a wide range of transfer programs, although the underlying variation differs, as she focuses on hurricanes.

2 Estimating the Response of Local Area Transfers to Employment Losses

2.1 Data

We compile several public-use data sets that together provide a wealth of information on local economic activity and government transfers.[5] These data sets are constructed by government agencies using administrative data. Our primary source is the Bureau of Economic Analysis Regional Economic Accounts (BEAR), which provides annual data on employment, earnings, and detailed transfer categories for each county since 1969.[6] We supplement the BEAR data with county-level data from the Social Security Administration (SSA) on Disability Insurance (DI) to separately measure disability and retirement transfers.[7] We use the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) data for annual population estimates to normalize our outcomes on a per capita basis.

We aggregate the county-level data to examine the effects of recessions for our preferred definition of local labor markets: metropolitan areas.[8] A slight complication is that geography definitions are not fixed over time; we use core-based statistical areas (CBSAs) as defined in 2003

[5]Parts of this section draw closely on Hershbein and Stuart (2021). That paper studies impacts on employment, population, and earnings, but does not consider transfers.

[6]The vast majority of transfers in the BEAR data come from federal and state governments. About 5 percent of transfers come from businesses in the form of liability payments for personal injury claims or direct money transfers through nonprofits (some of which are indirectly funded by governments). BEAR data measure transfers based on individuals' county of residence. Our measure of earnings is the sum of wages, salaries, and supplements. This information is available by individuals' place of work.

[7]Specifically, we subtract the SSA DI benefits from the BEAR Social Security retirement and disability (OASDI) measure to obtain estimates for Social Security retirement (OAS) benefits. We thank Tim Moore for generously providing historical county-level SSA DI files.

[8]Metropolitan statistical areas are one or more counties defined by the Office of Management and Budget as having "at least one urbanized area of 50,000 or more population, plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties" (Office of Management and Budget, 2003).

(reflecting the 2000 census). We use the personal consumption expenditures (PCE) deflator to adjust for inflation throughout, using 2019 dollar amounts.

2.2 Empirical Strategy

Our empirical strategy relies on cross-sectional variation in sharp employment changes that occur during nationwide recessions. We use this variation to estimate the impacts of local recession-induced employment losses on earnings and transfers.

Separately for each recession, we estimate the event study regression

$$y_{i,t} = s_i^r \delta_{t-p(r)}^r + x_{i,t}^r \beta^r + \mu_i^r + \varepsilon_{i,t}, \tag{1}$$

where $y_{i,t}$ is a measure of income in location i and year t, s_i^r measures the severity of recession r as the log employment change in location i from the nationwide recession start to trough (multiplied by -1), $x_{i,t}^r$ is a vector of control variables, and μ_i^r is a location fixed effect that absorbs time-invariant differences across locations. The key parameter of interest is $\delta_{t-p(r)}^r$, which describes the relationship between recession severity and local area earnings or transfers in year t relative to the nationwide recession starting year $p(r)$. The inclusion of location fixed effects means that one of the $\delta_{t-p(r)}^r$ coefficients must be normalized; we do this two years before the recession start because the exact timing of recessions is uncertain and there is variation in when aggregate economic indicators decline.[9] This specification allows the impact of each recession to vary flexibly across years, transparently showing both pretrends and dynamic impacts.

We measure local recession severity using annual employment data from BEAR. We modify NBER recession start and trough dates to account for our use of annual data. Specifically, we define s_i^r to be the log employment change for each geography between 1973–1975, 1979–1982, 1989–1991, 2000–2002, and 2007–2009.[10] Using fixed national timings for each recession, rather

[9]Because we show the entire range of estimates of $\delta_{t-p(r)}^r$, it is straightforward to see how our estimates would change with a different normalization year.

[10]The NBER recession dates are November 1973 to March 1975, January 1980 to July 1980, July 1981 to November 1982, July 1990 to March 1991, March to November 2001, and December 2007 to June 2009.

than location-specific start-to-trough periods, introduces some measurement error but minimizes the risk of endogeneity. We use wage and salary employment (private and public) to measure recession severity, as coverage of the self-employed is incomplete and changes over time.

Variation across areas in employment losses during recessions can arise from differences in industrial specialization (e.g., recessions could decrease demand for automobiles) or even finer differences in the products that are produced in an area (e.g., recessions could particularly decrease demand for more expensive trucks and SUVs). Idiosyncratic shocks to a single large firm also could drive local employment losses (c.f., Gabaix, 2011; Salgado, Guvenen and Bloom, 2020). While we assume that the employment decline during the recession is conditionally exogenous, the specification in Equation (1) is "reduced-form" and captures subsequent adjustments made by individuals, such as differential migration. Next we examine the role of changes in the composition of residents living in an area.

The key identifying assumption is that local recession severity, s_i^r, is exogenous to residual determinants of local labor market outcomes, $\varepsilon_{i,t}$, conditional on the controls in the regression. In addition to controlling for time-invariant differences across local areas, we include several variables in $x_{i,t}^r$ to bolster the credibility of this assumption. First, we include census division-by-year fixed effects to flexibly capture broad shifts in local labor demand, supply, and transfers that are not driven by recessions, such as the rise of the sunbelt (Glaeser and Tobio, 2008). Second, we control for interactions between *pre*recession population growth and year indicators to adjust for secular shifts in local labor supply, which could affect earnings and transfers.[11] A key possible violation of our identifying assumption is the presence of pretrends in local economic activity that are correlated with recession severity. Fortunately, estimates of $\delta_{t-p(r)}^r$ for prerecession years allow us to directly examine the presence of pretrends. To further address autocorrelation concerns, we additionally control in some specifications for the severity of prior recessions, again interacted with year indicators.

[11] We control for the log change in population age 0–14, 15–39, 40–64, and 65 and above. We construct these population variables using SEER data, which are available starting in 1969. The prerecession population growth years are 1969–1973 (for the 1973–1975 recession), 1969–1979 (for the 1980–1982 recession), 1979–1989 (for the 1990–1992 recession), 1990–2000 (for the 2001 recession), and 1997–2007 (for the 2007–2009 recession).

We construct equally weighted averages of each $\delta^r_{t-p(r)}$ parameter estimate across the five recessions. These coefficients provide a more accurate representation of the average shifts in earnings and transfers before and after a recession. We provide the full set of recession-specific estimates in the appendix. To allow for arbitrary autocorrelation in the error term $\varepsilon_{i,t}$, we use a nonparametric bootstrap procedure. For each of the 500 bootstrap replications, we resample metropolitan areas with replacement and then estimate regressions for all five recessions.

2.3 Basic Patterns of Transfers per Capita and Recession Severity

Before moving to estimates of Equation (1), we describe basic patterns in transfers per capita, our key outcome of interest. Panel A of Figure 1 shows that real transfers per capita more than quadrupled between 1969 and 2019. The increase in transfers stems predominantly from the rise in medical, retirement, and disability insurance transfers. Medical transfers (essentially Medicare and Medicaid) grew from about \$330 per capita in 1970 to \$4,200 in 2019 (in 2019 dollars). Medical, retirement, and disability transfers account for 70–80 percent of total transfers throughout this period. By comparison, income maintenance transfers (primarily AFDC/TANF, EITC, SNAP, and SSI) equal about 10 percent of total transfers on average. Panel B of Figure 1 plots transfers per capita in logarithms to more clearly display cyclical patterns. UI benefits rise and fall around each recession, while cyclicality in other transfer categories is more muted. Appendix Table A.1 provides summary statistics on detailed transfer per capita categories over time. Transfers for Social Security retirement benefits are much larger than those for disability insurance, while Medicare and Medicaid are comparable in size.

The five recessions that we study differ in several ways. While there is little consensus on the macroeconomic causes of each recession, the drivers almost certainly differ (Temin, 1998). The 1973–1975 and 1980–1982 recessions followed increases in the price of oil and subsequent increases in interest rates by the Federal Reserve. There is less agreement on the causes of the 1990–1991 recession (Temin, 1998). The 2001 recession followed the burst of the dot-com bubble, while the 2007–2009 recession followed tumult in housing and financial markets. Despite the differences in the macroeconomic features of recessions, the impacts on local area employment, population, and earnings are remarkably similar (Hershbein and Stuart, 2021). Appendix Table A.2 shows considerable variation in the overall severity of recessions, measured by the change in nationwide employment from start to trough. The recessions from 2007–2009 and 1980–1982 were the most severe. Manufacturing and construction usually experience the largest employment decline, but the impact on other industries varies widely across recessions.[12]

Our empirical strategy makes use of the considerable variation in recession severity across space, as shown in Appendix Figures A.1–A.3. Recession severity within a local labor market displays only a modest positive correlation across recessions (see Appendix Table A.3). This fact is consistent with the different macroeconomic drivers of recessions and the different patterns of industry-level employment declines. To show that our results do not simply reflect lagged effects of previous downturns, we also estimate specifications that control for the severity of prior recessions.

3 Results

3.1 The Response of Earnings and Transfers per Capita

Figure 2 shows equally weighted averages of the $\delta^r_{t-p(r)}$ parameters for the log of real earnings per capita as a solid blue line. (We discuss the red line with circles in Section 3.2.) We include four years before the nationwide recession start to capture any pretrends, and we follow areas for 12 years afterward. Metro areas that experience more severe employment losses during recessions experience a sharp relative decline in earnings per capita, and this relative decline persists over the entire postrecession period. Appendix Figure A.4 shows that earnings per capita fall after each recession, and Appendix Figure A.5 shows that these results are robust to different sets of control variables, including the severity of prior recessions.

Panel A of Table 1 summarizes the response of earnings per capita 1–3, 4–6, and 7–9 years after the nationwide trough. In response to a 5 percent greater employment loss during a recession,

[12] Appendix Table A.2 uses annual data from BEAR. These data mask some of the severe employment losses that are evident in monthly data, but cross-industry patterns are similar in Current Employment Statistics data.

earnings per capita is 5.1 percent lower 1–3 years after the trough. There is limited recovery, as earnings per capita remains 4.8 percent lower 7–9 years after the trough. The average impact of a one standard-deviation greater employment loss after 7–9 years is similar, at 4.4 percent.[13]

In Hershbein and Stuart (2021), we show that employment losses during recessions yield persistent declines in relative employment, population, and employment-population ratios as well. That paper contains further discussion of the underlying determinants of local labor market hysteresis. For this paper, the key takeaway is that recessions generate persistent relative declines in economic activity in areas that experience more severe employment losses.[14]

To what degree do person-based transfers respond to the decline in local economic activity after recessions? Figure 3 provides an initial answer to this question by showing estimates of the effect of recession-induced employment changes on the log of per-capita real transfers. We find that transfers rise by more in local labor markets that experience a more severe recession. Moreover, transfers remain elevated throughout the postrecession period. As with earnings impacts, the pattern is similar following each recession (Appendix Figure A.6), and results are robust to different sets of control variables (Appendix Figure A.7). Panel A of Table 1 shows that a 5 percent greater employment loss during the recession leads on average to a 2.2 percent increase in transfers per capita 1–3 years after the recession trough. At 7–9 years post trough, transfers per capita are slightly higher, at 2.4 percent.

To shed light on why transfers per capita increase after recessions, Panel A of Figure 4 plots estimates from regressions in which the dependent variables are the log of transfers per capita in each of several categories. In the immediate aftermath of the recession, UI transfers respond most

[13]These results do not adjust for changes in local prices. Using average rent prices by metro area from the census and ACS, we estimate a long-run elasticity to employment changes across recessions of about -0.6. Assuming 30 percent of income is spent on housing, a 5 percent greater employment loss during a recession translates into roughly a 0.9 percent ($= 0.6 \times 0.05 \times 0.3$) long-term decrease in expenditures, potentially offsetting some of the income losses. To the extent that local prices decline, the increase in transfers we document below will be even larger in real terms. However, this interpretation is complicated in that homeowners facing a similar housing price loss suffer a negative wealth effect (Campbell and Cocco, 2007; Mian, Rao and Sufi, 2013; Guren et al., 2021), decreasing effective income, and that the value of amenities may also decline.

[14]Equation (1), which relies on cross-sectional variation in employment losses during recessions, identifies *relative* differences between areas that experience more or less severe recession, not *absolute* differences from an area's own past levels.

strongly in proportional terms: two years after the recession trough UI transfers increase by 15 percent in response to a 5 percent greater employment loss. However, UI transfers decline relatively quickly and display no persistent long-run increase. Income maintenance transfers display the second strongest response, but gradually decline by 50 percent over the decade after the trough. In contrast, the other transfer categories increase gradually and remain elevated over this horizon.

The elasticities shown in panel A describe proportional responses, but the contribution of each category to the *overall* transfer response also depends on the relative size of each category. To shed light on this dimension, Panel B of Figure 4 displays the effects of recession-induced employment losses on per-capita transfers divided by estimated effects on per-capita earnings (both in levels, not logs).[15] This ratio of estimates is akin to an effective replacement rate, as it can be interpreted as the increase in transfers per capita for each dollar decrease in earnings per capita. We focus on the postrecession period, because the impact on earnings is near zero before. The replacement rate (shown as a thick black line) is 12 percent near recession trough and tends to increase during postrecession years. UI accounts for the greatest share of the transfers response in the first two years after a recession, before fading as benefits expire. In the long run, nearly all of the increase in total transfers comes from retirement and disability (e.g., Social Security OASDI) and medical (Medicare and Medicaid). Income maintenance transfers (AFDC/TANF, SSI, SNAP, and EITC) contribute smaller replacement rates because they account for a smaller share of total transfers (see Figure 1).

Panel B of Table 1 shows that, on average, the increase in transfers per capita is 16 percent of the decrease in earnings per capita 7–9 years after the recession trough.[16] The table also reports

[15]Appendix Figure A.8 contains the recession-specific estimates that underlie Panel A, and Appendix Figure A.9 reports analogous results for Panel B.

[16]Because these replacement rates are the ratios of two estimates, calculating the standard error of the ratio through a nonparametric bootstrap is complicated by a very small number of cases in which the denominator is close to zero. Instead, we apply a first-order Taylor series approximation, which delivers the following variance estimate:

$$\widehat{Var}\left(\frac{\hat{\beta}_T}{\hat{\beta}_E}\right) = \frac{(\hat{\beta}_T)^2}{(\hat{\beta}_E)^2}\left[\frac{\widehat{Var}(\hat{\beta}_T)}{(\hat{\beta}_E)^2} - 2\frac{\widehat{Cov}(\hat{\beta}_T, \hat{\beta}_E)}{\hat{\beta}_T\hat{\beta}_E} + \frac{\widehat{Var}(\hat{\beta}_E)}{(\hat{\beta}_E)^2}\right],$$

where $\hat{\beta}_T$ is the coefficient for transfers per capita, $\hat{\beta}_E$ is the coefficient for earnings per capita, and the variance and replacement rates for more detailed transfer categories. Among retirement and disability, retirement (old-age security, OAS) accounts for 88 percent of the dollar increase in transfers, due to its more universal nature, although DI is about equally responsive in an elasticity sense (Appendix Figure A.10). The increase in medical transfers is greater for Medicare but still sizable for Medicaid (public assistance medical care).

3.2 The Role of Recession-Induced Changes in the Age Structure of Local Areas

The longer-term increase in transfers, especially in programs not typically thought of as the safety net, is perhaps most surprising. One possible explanation is that areas which experience greater employment losses also see changes in the composition of residents due to different migration responses. Since we find persistently elevated transfers among Social Security retirement and Medicare, a natural hypothesis is that areas hit harder by recessions become older. Indeed, Appendix Figure A.11 shows that, for each recession, there is an increase in the share of the population that is 65 or older and a decrease in the share age 15–39.[17]

To quantify the importance of changes in the age structure, we estimate for each recession the cross-sectional relationship between log total transfers per capita and the shares of the population age 15–39, 40–64, and 65+ at the metropolitan area level, controlling for division fixed effects.[18] We then multiply the coefficient estimates for each age group from these regressions by coefficient estimates of the change in age structure from Appendix Figure A.11. The temporal evolution of the resulting products provides a simulated path of how transfers would be expected to evolve solely from the recession-induced impacts on the age structure. While recessions could affect the relationship between transfers and age, we view this back-of-the-envelope calculation as helpful for informing the potential role of shifts in the age structure.

We show these paths in Figure 3 in red circles. The share of the increase in transfers explained

covariance terms are estimated via the bootstrap.

[17]Hershbein and Stuart (2021) show that the decline in population after the 2001 and 2007–2009 recessions is driven entirely by falling in-migration, as opposed to rising out-migration. Monras (2020) also documents the importance of falling in-migration after the Great Recession.

[18]We use prerecession cross-sections: 1971 for the 1973–1975 recession, 1977 for the 1980–1982 recession, 1987 for the 1990–1991 recession, 1998 for the 2001 recession, and 2005 for the 2007–2009 recession.

by the age structure tends to rise throughout the postrecession period, consistent with observed gradual changes in the age structure. At the end of the posttrough horizon, age shifts alone can explain 60 percent of the increase in transfers per capita on average. We confirm that retirement and disability transfers are the main age-related mechanism in Appendix Figure A.12, which shows the event studies of the response of those forms of transfers and the analogous predicted shifts from the age structure changes.[19] By comparison, Figure 2 shows that shifts in the age structure explain less than 20 percent of the decrease in earnings per capita.

4 Conclusion

This paper examines how transfers respond to declines in local economic activity induced by recessions. We find that recessions lead to persistent decreases in earnings per capita in areas with more employment losses. These areas also experience lasting increases in transfers per capita. In the short term, unemployment insurance accounts for much of the local transfer response. However, the longer-term response comes from medical, retirement, and disability transfers. Income maintenance transfers also rise, but they play a smaller role in the overall response because they are a smaller share of total transfers. On average, we find that a 5 percent greater employment loss during a recession leads to a 2.4 percent increase in transfers per capita 7–9 years after the recession trough.

These results paint a nuanced picture of the response of the safety net. On the one hand, programs that receive the greatest attention in discussions of countercyclical policy—such as unemployment insurance, Temporary Aid to Needy Families, and the Supplemental Nutrition Assistance Program—play little role in offsetting the long-run relative earnings losses in metro areas that experience more severe recessions. On the other hand, programs such as Social Security retirement, Disability Insurance, Medicaid, and Medicare partially insure areas against the longer-term effects of recessions. On average, transfers offset 16 percent of the longer-run

[19]The age structure explains little of the rise in other transfer categories, with the exception of Medicare within medical transfers.

decline in earnings in metro areas hit harder by recessions.

Federal transfers that are nominally person-based provide implicit, persistent, and underappreciated geographic transfers from economically more successful places to economically less successful places. Over the decade following a recession trough, our estimates imply that a median-sized metro (about 265,000 residents) that experiences a 5 percent greater employment loss receives about $630 million more in transfers.[20] By virtue of its larger population, a metro with 1.86 million residents (the 90th percentile) facing the same log employment loss would receive about $4.4 billion over the same time period.

Because the long-run consequences of recessions on local labor markets are not yet widely appreciated, there has been little discussion of whether the existing structure of the social safety net constitutes an appropriate policy response, not just for individuals but for communities as a whole. The normative consequences of this spatial redistribution depend not only on the standard balancing of consumption smoothing benefits and moral hazard costs, but also on particular considerations of place-based policies, such as whether a dollar of transfers is more or less valuable when directed to an area with depressed economic activity. One important takeaway from our results is that the most responsive transfer programs in the current system are unlikely to encourage labor supply, skill development, or job creation, which could be essential factors in helping local areas recover. A related important direction for future research is to study how nominally person-based transfers interact with place-based policies in affecting efficiency and equity.

[20]We calculate this number by adding all the coefficients in Figure 3 for 10 years after the nationwide recession trough—which provides an estimate of the total percent increase in transfers per capita—and then multiplying by the product of current total transfers (about $9,000, see Figure 1), the magnitude of the employment loss (5 percent), and the number of residents. This simple calculation does not account for the fact that a 5 percent greater employment loss leads to about a 2.5 percent decrease in population 7–9 years after the recession trough (Hershbein and Stuart, 2021). Accounting for population declines would lead to an aggregate number that is only a few percent smaller.

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Table 1: Summary of Impacts of Log Employment Decreases during Recessions on Metropolitan Area Earnings and Transfers

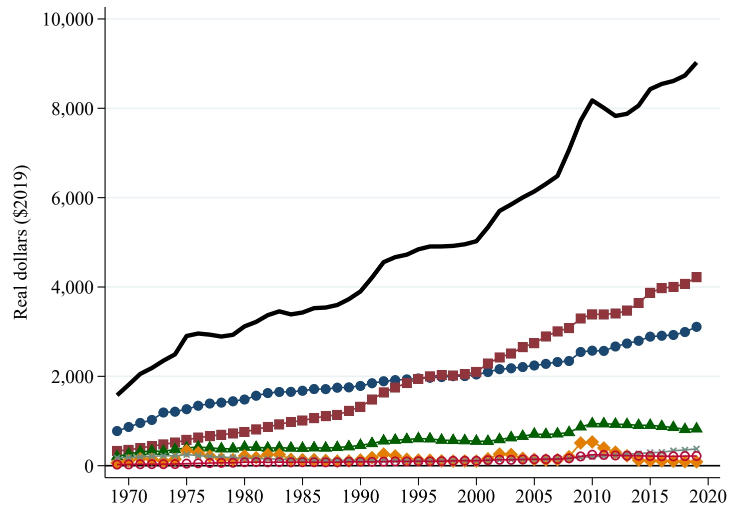
	Horizon relative to nationwide recession trough		
	1–3 years post	4–6 years post	7–9 years post
Panel A: Overall Elasticities, by Dependent Variable			
Log real earnings per capita	−1.022	−0.991	−0.954
	(0.046)	(0.060)	(0.076)
Implied effect of 1 SD log employment decrease	*−0.049*	*−0.047*	*−0.044*
Log real transfers per capita	0.446	0.475	0.480
	(0.037)	(0.052)	(0.059)
Implied effect of 1 SD log employment decrease	*0.023*	*0.024*	*0.023*
Panel B: Detailed Transfers Relative to Earnings Impact ($\times -100$)			
Total transfers per capita	11.98	13.87	16.22
	(0.97)	(1.32)	(1.86)
Retirement and DI	5.27	7.51	8.80
	(0.38)	(0.64)	(0.95)
Social Security OAS	4.35	6.24	7.74
	(0.35)	(0.60)	(0.92)
Social Security DI	0.86	1.12	1.03
	(0.10)	(0.14)	(0.18)
Medical	3.41	4.87	6.38
	(0.58)	(0.81)	(1.12)
Medicare	2.78	3.86	5.09
	(0.35)	(0.51)	(0.70)
Public assistance medical care	0.75	1.16	1.44
	(0.43)	(0.53)	(0.74)
Income maintenance	2.02	1.81	1.87
	(0.25)	(0.24)	(0.36)
SSI	0.18	0.27	0.37
	(0.05)	(0.07)	(0.08)
EITC	0.20	0.27	0.25
	(0.06)	(0.11)	(0.15)
SNAP	1.27	1.05	0.96
	(0.13)	(0.12)	(0.18)
UI	1.08	−0.22	−0.18
	(0.21)	(0.15)	(0.25)

NOTE: Panel A reports estimates from Equation (1), averaged across five recessions, at different time horizons since recession trough. Standard errors are calculated using a metro-area cluster bootstrap of the entire estimation and averaging process. We impose the constraint that prerecession coefficients equal zero and group postrecession coefficients across years 1–3, 4–6, 7–9, and 10. Panel B shows estimates for select transfer categories; we normalize these by dividing the coefficients for transfers per capita by the coefficients from earnings per capita (both in levels), and multiplying by -100. Panel B thus shows impacts on transfers as a percentage of the impact on earnings, where this percentage is constructed as the average transfers estimate across recessions divided by the average earnings estimate across recessions. Standard errors for Panel B are calculated using the metro-area cluster bootstrap and a first-order Taylor approximation, as described in the text. The key independent variable in both panels is the log wage and salary employment change during the recession from BEAR data. All dollar values are inflation-adjusted using the PCE deflator and divided by total population from SEER to create per capita measures. All regressions control for division-year fixed effects and interactions between prerecession population growth and year indicators. There are 359 metropolitan areas in the sample. Full, recession-specific estimates at the 7–9 year horizon are shown in Appendix Tables A.4 and A.5.

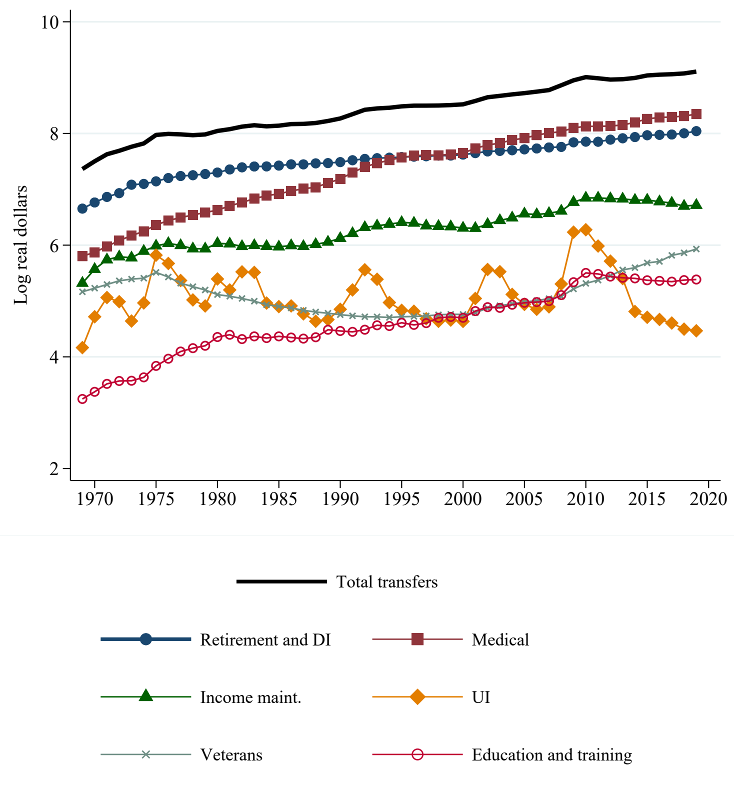
SOURCE: Authors' calculations using BEAR and SEER data.

Figure 1: Aggregate Trends in Real Transfers per Capita, 1969–2019

(a) Levels

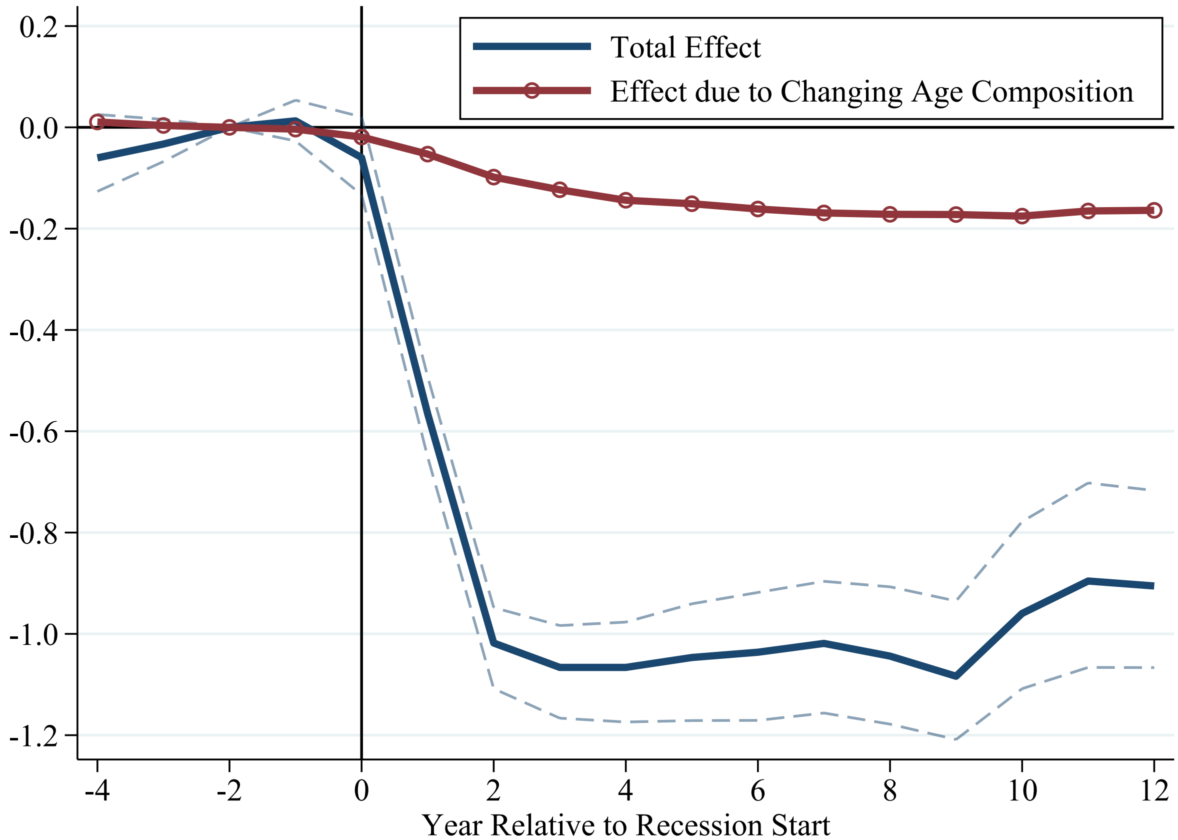


(b) Logs



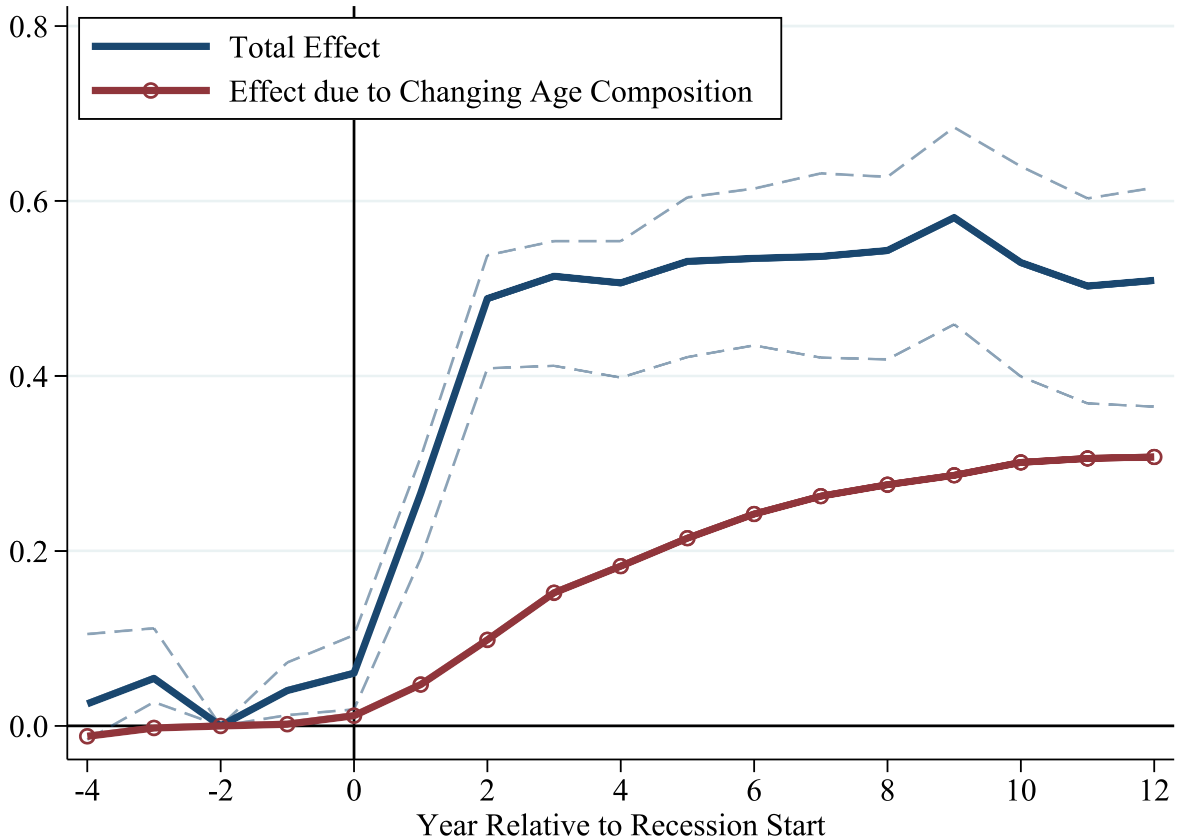
NOTE: Figure reports national totals, per capita, by transfers category across 359 metropolitan areas (CBSAs). Transfers categories are indicated by the legend.
SOURCE: Authors' calculations using BEAR and SEER data.

Figure 2: Impacts of Log Employment Decreases during Recessions on Metropolitan Area Log Real Earnings per Capita and Implied Changes via Shifts in Age Structure



NOTE: Figure reports estimates of Equation (1), averaged across recessions, for the dependent variable of log real earnings per capita and predicted effects on earnings due to the recession-induced impacts on the age structure. The latter is calculated based on estimates of changes in the age structure after recessions and the prerecession relationship between transfers and age structure, as described in the text. The key independent variable is the log wage and salary employment change during the recession from BEAR data. There are 359 metropolitan areas in the sample. The 95 percent pointwise confidence intervals come from a metro-area cluster bootstrap of the entire estimation and averaging process.
SOURCE: Authors' calculations using BEAR and SEER data.

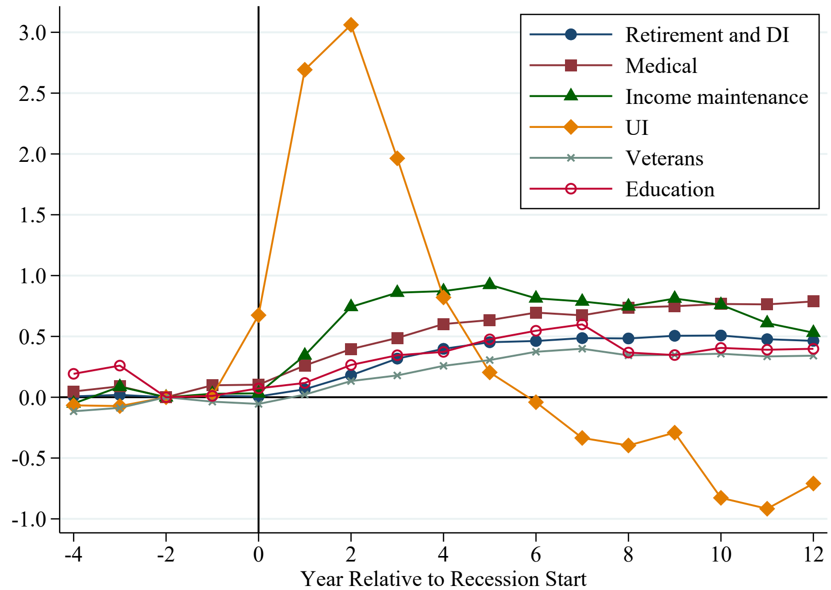
Figure 3: Impacts of Log Employment Decreases during Recessions on Metropolitan Area Log Real Transfers per Capita and Implied Changes via Shifts in Age Structure



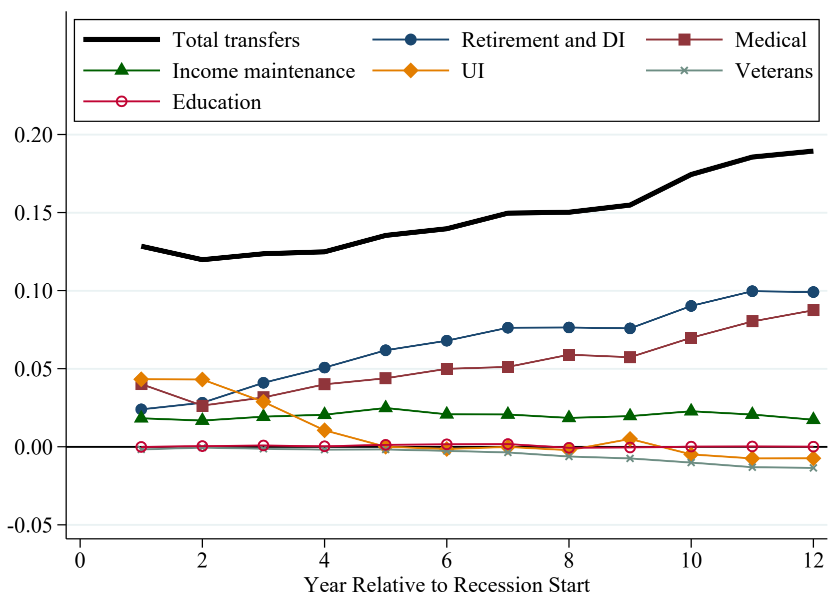
NOTE: Figure reports estimates of Equation (1), averaged across recessions, for the dependent variable of log real transfers per capita and predicted effects on earnings due to the recession-induced impacts on the age structure. See notes to Figure 2.
SOURCE: Authors' calculations using BEAR and SEER data.

Figure 4: Impacts of Log Employment Decreases during Recessions on Metropolitan Area Real Transfers per Capita and Effective Replacement Rates, by Category

(a) Elasticities



(b) Replacement Rates



NOTE: Figure reports estimates of Equation (1), averaged across recessions. Panel A displays elasticities, where the dependent variable is log transfers per capita as in Figure 3, but for specific transfer categories. Panel B displays coefficients for per-capita transfers in the indicated category divided by coefficients for per-capita earnings (both in levels), where these ratios are averaged across recessions. See notes to Figure 2.
SOURCE: Authors' calculations using BEAR and SEER data.

Online Appendices

Table A.1: Summary of Detailed per Capita Transfers, Selected Years

	1973	1980	1990	2001	2007	2019
Total transfers per capita	2351	3118	3901	5337	6486	9026
Retirement and DI	1191	1481	1785	2097	2321	3109
Social Security and DI	1086	1367	1648	1976	2186	3001
OAS	977	1199	1490	1728	1855	2632
DI	108	167	157	246	331	369
Non-SS retirement	105	114	137	121	135	108
Medical	479	755	1320	2285	3009	4219
Medicare	228	433	752	1154	1651	2307
Public assistance medical care	240	313	546	1115	1315	1868
Military medical care	11	9	21	17	43	45
Income maintenance	322	416	456	546	713	825
SSI	73	91	115	159	166	173
Other income maintenance	203	212	203	173	259	285
EITC		21	41	141	170	204
SNAP		93	97	73	118	163
UI	104	220	128	155	134	87
State UI	95	178	124	151	128	85
Federal UI	9	43	4	4	5	2
Veterans	220	166	116	121	155	376
Education	36	78	87	124	148	218
Other	1	1	8	8	6	192

NOTE: Table shows real per capita transfers by category for select years. We use the PCE deflator from the BEA for adjustment to year 2019 dollars. Per capita numbers represent totals across 359 sample CBSAs divided by the aggregate population in those CBSAs in each year. The table includes the full set of transfers we observe in BEA data, as well as separation of Social Security OASDI into OAS and DI components using DI data from SSA.
SOURCE: Authors' calculations using BEAR, SEER, and SSA data.

Table A.2: Aggregate Employment Changes, by Recession

	Share of start year emp. (1)	Log emp. change (2)	Emp. change (3)	Share of start year emp. (4)	Log emp. change (5)	Emp. change (6)	Share of start year emp. (7)	Log emp. change (8)	Emp. change (9)
	1973–1975 Recession			1980–1982 Recession			1990–1991 Recession		
Total	1.000	0.004	421,100	1.000	0.010	1,123,200	1.000	0.011	1,531,000
Manufacturing	0.216	−0.090	−1,758,600	0.196	−0.110	−2,230,100	0.150	−0.049	−962,800
Services	0.203	0.053	1,041,400	0.220	0.103	2,606,900	0.276	0.060	2,264,500
Government	0.177	0.046	792,000	0.168	0.008	149,000	0.156	0.023	493,000
Retail Trade	0.159	0.010	153,300	0.161	0.020	359,600	0.168	0.005	110,800
Finance, Insurance, Real estate	0.076	0.027	192,700	0.079	0.037	322,200	0.080	−0.014	−146,000
Transportation and Public Utilities	0.054	−0.018	−91,400	0.052	0.003	17,400	0.048	0.034	220,600
Construction	0.054	−0.084	−410,000	0.054	−0.096	−536,900	0.054	−0.065	−451,500
Wholesale Trade	0.048	0.073	341,800	0.052	0.008	44,900	0.050	−0.012	−76,200
Mining	0.008	0.140	114,100	0.011	0.264	350,800	0.008	−0.025	−26,000
Agriculture, Forestry, Fisheries	0.006	0.073	45,800	0.008	0.043	39,400	0.010	0.077	104,600
	2001 Recession			2007–2009 Recession					
Total	1.000	−0.000	−62,700	1.000	−0.034	−5,866,000			
Manufacturing	0.109	−0.120	−2,004,900	0.082	−0.147	−1,982,600			
Services	0.409	0.022	1,504,500	0.432	−0.012	−886,900			
Government	0.141	0.027	638,000	0.137	0.018	452,000			
Retail Trade	0.114	−0.015	−268,300	0.107	−0.064	−1,171,600			
Finance, Insurance, Real estate	0.082	0.019	260,100	0.094	0.025	426,900			
Construction	0.059	0.013	128,500	0.064	−0.190	−1,975,100			
Transportation and Public Utilities	0.038	−0.022	−133,000	0.037	−0.061	−385,500			
Wholesale Trade	0.039	−0.027	−169,900	0.037	−0.070	−443,300			
Mining	0.005	−0.012	−9,000	0.006	0.107	114,300			
Agriculture, Forestry, Fisheries	0.005	−0.010	−8,700	0.005	−0.017	−14,200			

NOTE: Table reports nationwide wage and salary employment changes during recessions. Employment changes are from 1973–1975, 1979–1982, 1989–1991, 2000–2002, and 2007–2009. The 1973–1991 data are based on SIC industries, and the 2000–2009 data are based on NAICS industries. Industry changes may not sum to total changes due to rounding.
SOURCE: Authors' calculations using BEAR data.

Table A.3: Correlation of Metropolitan Area Recession Shocks

	Change in Log Employment during Recession Years				
	1973–75	1979–82	1989–91	2000–02	2007–09
Panel A: Unadjusted					
1973–75	1.000				
1980–82	0.385	1.000			
1990–91	0.458	0.154	1.000		
2001	0.445	0.412	0.281	1.000	
2007–09	0.354	0.210	0.002	0.154	1.000
Panel B: Adjusted for Census division					
1973–75	1.000				
1980–82	0.324	1.000			
1990–91	0.275	0.168	1.000		
2001	0.289	0.305	0.234	1.000	
2007–09	0.364	0.068	−0.043	0.089	1.000
Panel C: Adjusted for Census division and prerecession population growth					
1973–75	1.000				
1980–82	0.256	1.000			
1990–91	0.163	0.019	1.000		
2001	0.143	0.084	0.100	1.000	
2007–09	0.401	0.279	0.052	0.212	1.000

NOTE: Table reports correlations of log wage and salary employment changes across recessions for 359 metropolitan areas. Panel B reports correlations after partialling out Census division fixed effects, and Panel C partials out Census division fixed effects and prerecession population growth.
SOURCE: Authors' calculations using BEAR data.

Table A.4: Impacts of Log Employment Decreases during Recessions on Metropolitan Area Earnings and Transfers, 7–9 Years after Recession Trough, by Recession

	Recession				
	1973–1975	1980–1982	1990–1991	2001	2007–2009
Total earnings per capita	−0.794	−0.589	−1.118	−1.622	−0.647
	(0.115)	(0.158)	(0.147)	(0.213)	(0.170)
Total transfers per capita	0.420	0.426	0.427	0.905	0.223
	(0.133)	(0.104)	(0.187)	(0.126)	(0.088)
Retirement and DI	0.437	0.450	0.330	0.959	0.227
	(0.109)	(0.093)	(0.177)	(0.142)	(0.073)
Social Security and DI	0.524	0.542	0.390	0.949	0.157
	(0.115)	(0.103)	(0.173)	(0.139)	(0.063)
Social Security OAS	0.492	0.567	0.355	0.986	0.166
	(0.119)	(0.106)	(0.162)	(0.147)	(0.074)
Social Security DI	0.811	0.463	0.458	0.687	0.139
	(0.161)	(0.145)	(0.248)	(0.214)	(0.179)
Non-SS retirement	−0.214	−0.265	−0.381	1.191	−0.833
	(0.293)	(0.277)	(0.457)	(0.606)	(0.445)
Medical	1.275	0.872	0.086	0.611	0.618
	(0.271)	(0.162)	(0.238)	(0.181)	(0.124)
Medicare	0.618	0.637	0.390	0.783	0.451
	(0.231)	(0.142)	(0.212)	(0.214)	(0.118)
Public assistance medical care	2.164	1.175	0.059	0.384	0.621
	(0.607)	(0.299)	(0.329)	(0.577)	(0.252)
Military medical care	0.054	0.316	−0.309	0.796	−0.636
	(0.393)	(0.243)	(0.414)	(0.455)	(0.160)
Income maintenance	0.359	0.121	1.155	1.241	0.568
	(0.353)	(0.270)	(0.292)	(0.387)	(0.188)
SSI	1.026	1.108	0.177	0.653	0.680
	(0.433)	(0.253)	(0.293)	(0.310)	(0.236)
Other income maintenance	0.124	−0.627	2.196	1.158	0.054
	(0.465)	(0.385)	(0.524)	(0.683)	(0.383)
EITC		0.637	0.213	0.500	0.454
		(0.172)	(0.263)	(0.209)	(0.134)
SNAP		0.154	1.811	2.510	1.327
		(0.423)	(0.413)	(0.543)	(0.375)
UI	−1.498	−1.015	−0.086	1.799	−2.899
	(0.489)	(0.420)	(0.471)	(0.703)	(0.630)
State UI	−1.829	−1.135	−0.144	1.905	−3.001
	(0.504)	(0.419)	(0.481)	(0.704)	(0.575)
Federal UI	1.687	0.386	0.967	2.389	−2.632
	(0.629)	(0.599)	(0.644)	(1.146)	(1.673)
Veterans	0.385	0.642	0.918	−0.034	0.135
	(0.175)	(0.159)	(0.476)	(0.370)	(0.268)
Education	−0.082	0.189	0.900	0.765	−0.398
	(0.394)	(0.195)	(0.417)	(0.523)	(0.412)
Other	4.494	−0.690	−0.252	0.298	2.677
	(2.563)	(0.891)	(1.069)	(0.665)	(0.925)

NOTE: Table reports estimates of Equation (1), separately for each recession. The dependent variable is log transfers in the indicated category per capita. See notes to Table 1.
SOURCE: Authors' calculations using BEAR and SEER data.

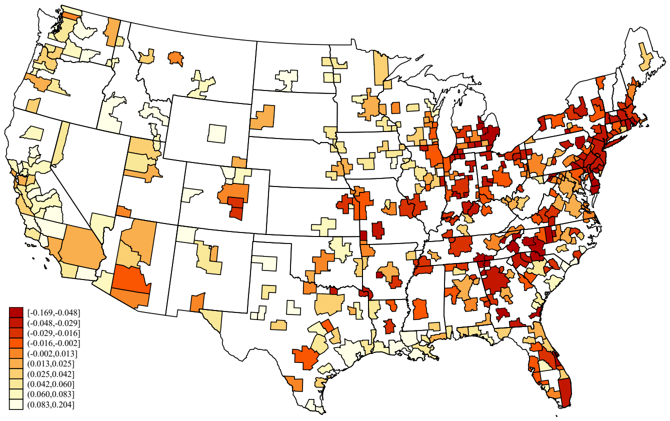
Table A.5: Impacts of Log Employment Decreases during Recessions on Detailed Transfer Categories, Relative to Effect on Earnings (Replacement Rates), 7–9 Years after Recession Trough, by Recession

	Recession				
	1973–1975	1980–1982	1990–1991	2001	2007–2009
Total transfers per capita	21.11	20.08	−0.73	10.12	36.81
	(3.13)	(4.44)	(3.88)	(2.95)	(9.54)
Retirement and DI	13.13	10.89	−0.88	5.99	17.99
	(1.96)	(2.37)	(1.71)	(1.15)	(4.92)
Social Security and DI	13.13	10.64	−0.64	5.65	17.90
	(1.92)	(2.30)	(1.62)	(1.10)	(4.97)
Social Security OAS	11.39	9.96	−0.38	4.97	16.01
	(1.69)	(2.19)	(1.40)	(1.00)	(4.71)
Social Security DI	1.74	0.67	−0.20	0.98	1.91
	(0.29)	(0.20)	(0.37)	(0.32)	(0.50)
Non-SS retirement	0.01	0.25	−0.24	0.34	0.08
	(0.42)	(0.47)	(0.52)	(0.27)	(0.46)
Medical	8.42	8.83	−4.34	0.65	24.40
	(1.31)	(2.43)	(3.34)	(1.61)	(6.97)
Medicare	5.63	5.23	−1.12	0.99	18.82
	(0.96)	(1.47)	(1.62)	(1.01)	(5.19)
Public assistance medical care	2.89	3.86	−3.41	−0.39	6.40
	(0.71)	(1.22)	(2.51)	(0.99)	(3.15)
Military medical care	−0.16	−0.26	0.19	0.05	−0.82
	(0.08)	(0.11)	(0.14)	(0.36)	(0.31)
Income maintenance	1.47	1.18	2.27	1.87	2.42
	(0.72)	(0.63)	(1.09)	(0.70)	(0.95)
SSI	0.43	0.69	0.14	0.19	0.63
	(0.27)	(0.20)	(0.25)	(0.09)	(0.21)
Other income maintenance	0.37	−0.02	0.98	0.60	0.11
	(0.40)	(0.50)	(0.62)	(0.37)	(0.52)
EITC		0.08	0.16	0.15	0.58
		(0.06)	(0.67)	(0.12)	(0.21)
SNAP		0.43	0.99	0.93	1.11
		(0.22)	(0.46)	(0.27)	(0.42)
UI	−1.46	−1.15	−0.10	1.32	−1.83
	(0.89)	(0.48)	(0.42)	(0.51)	(0.55)
State UI	−1.54	−0.95	−0.12	1.25	−1.76
	(0.89)	(0.41)	(0.41)	(0.50)	(0.54)
Federal UI	0.08	−0.20	0.02	0.07	−0.07
	(0.07)	(0.10)	(0.04)	(0.04)	(0.13)
Veterans	−0.09	0.26	2.32	−0.26	−6.93
	(0.22)	(0.18)	(1.07)	(0.41)	(3.71)
Education	−0.54	−0.01	0.04	0.48	−0.91
	(0.28)	(0.13)	(0.22)	(0.38)	(0.53)
Other	0.17	0.07	−0.04	0.08	1.67
	(0.18)	(0.18)	(0.04)	(0.10)	(0.77)

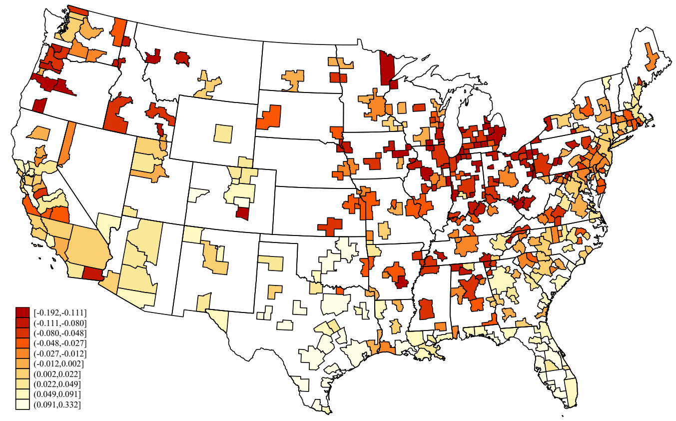
NOTE: Table reports estimates of Equation (1), separately for each recession. The dependent variable is transfers in the indicated category per capita (in levels). We normalize the impacts by dividing the coefficients for transfers by the coefficients for earnings per capita and multiplying by −100. See notes to Table 1. This table includes the full set of detailed transfers we observe in BEA data.
SOURCE: Authors' calculations using BEAR and SEER data.

Figure A.1: Log Employment Changes during Recessions in Metropolitan Areas

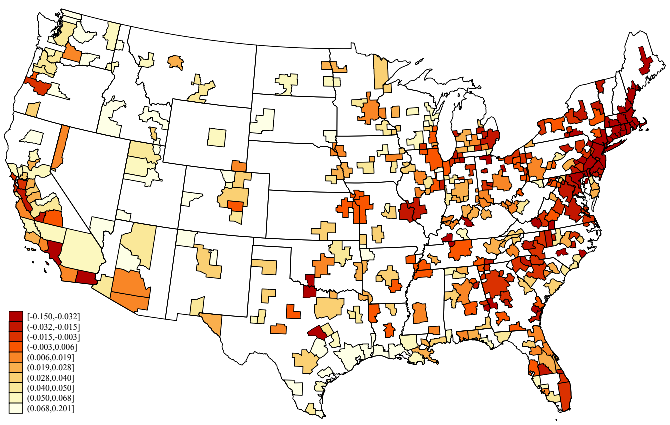
(a) 1973–1975 Recession



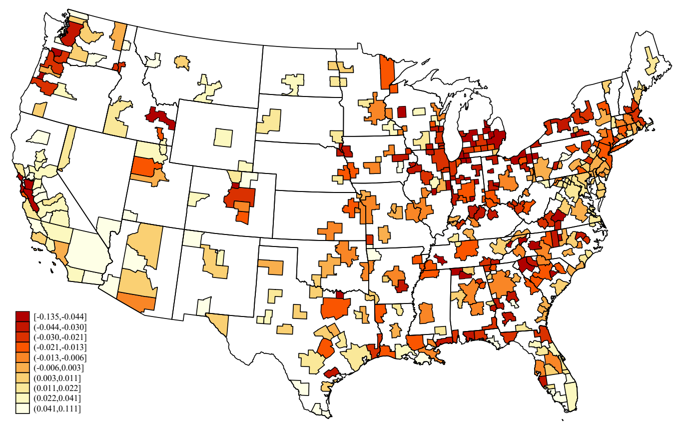
(b) 1980–1982 Recession



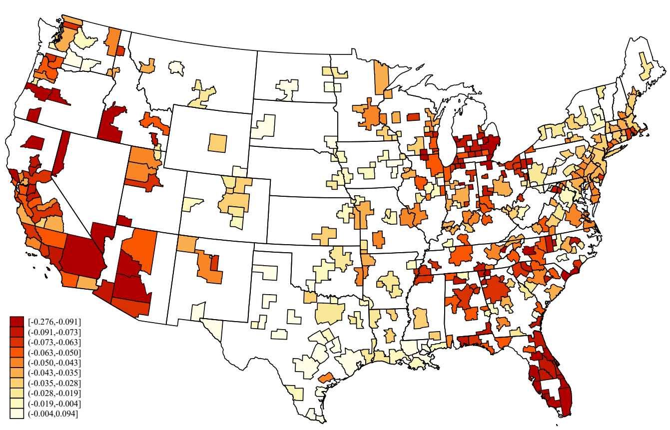
(c) 1990–1991 Recession



(d) 2001 Recession

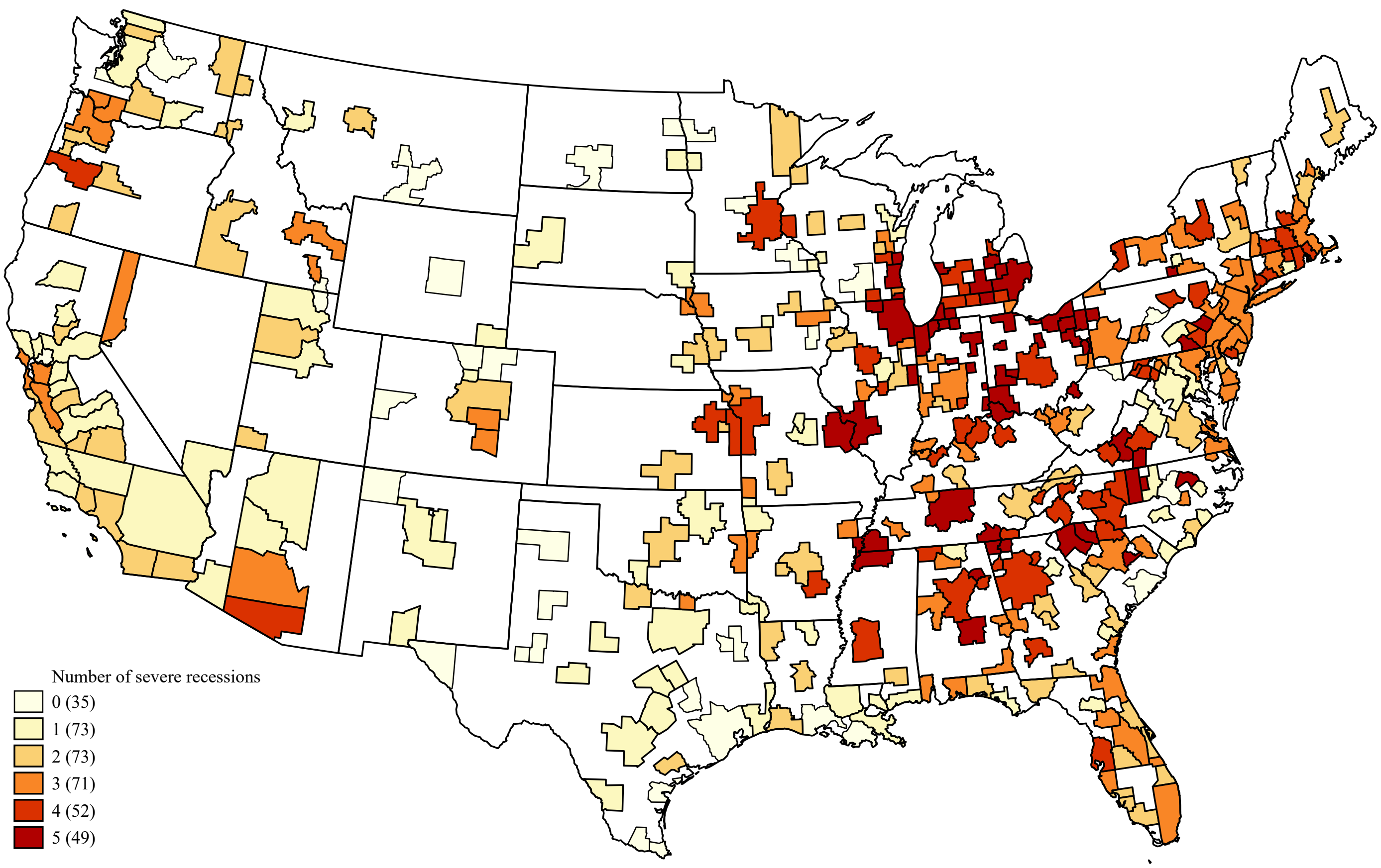


(e) 2007–2009 Recession



NOTE: Each map shows the change in log employment from nationwide recession start to trough for 359 CBSAs (Office of Management and Budget vintage 2003 definitions) as described in the text. Areas in darker colors experienced larger employment losses.
SOURCE: Authors' calculations using BEAR data.

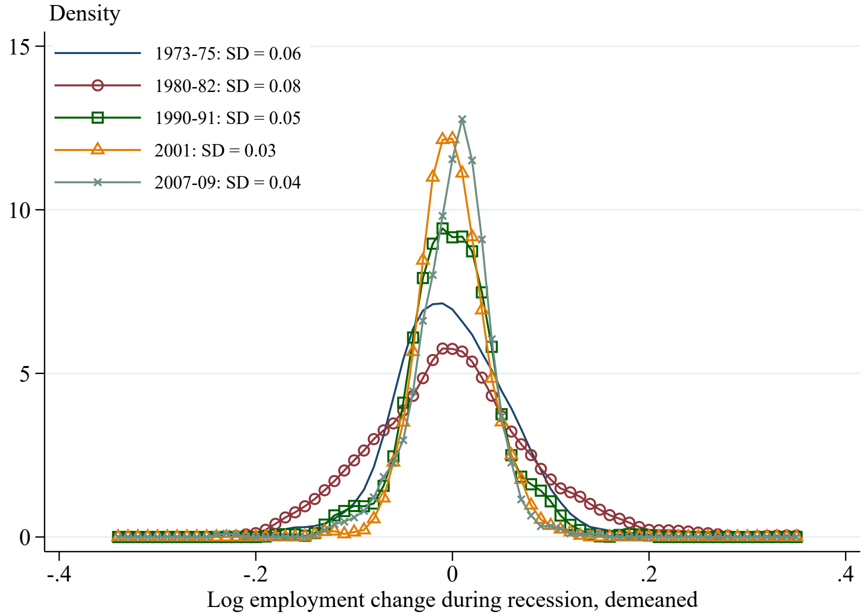
Figure A.2: Frequency of Severe Recessions, by Metropolitan Area, from 1973–2009



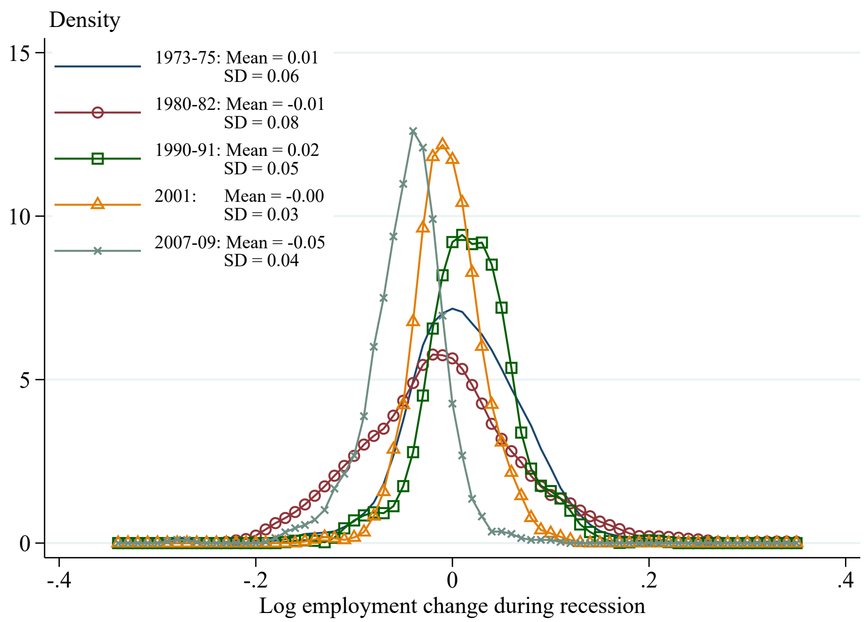
NOTE: We denote an area as suffering a severe recession if its log employment change for a given recession is less than the median across CBSAs for that recession.
SOURCE: Authors' calculations using BEAR data.

Figure A.3: Density of Log Employment Changes during Recessions Across Metros

(a) Log Employment Changes, Demeaned



(b) Log Employment Changes

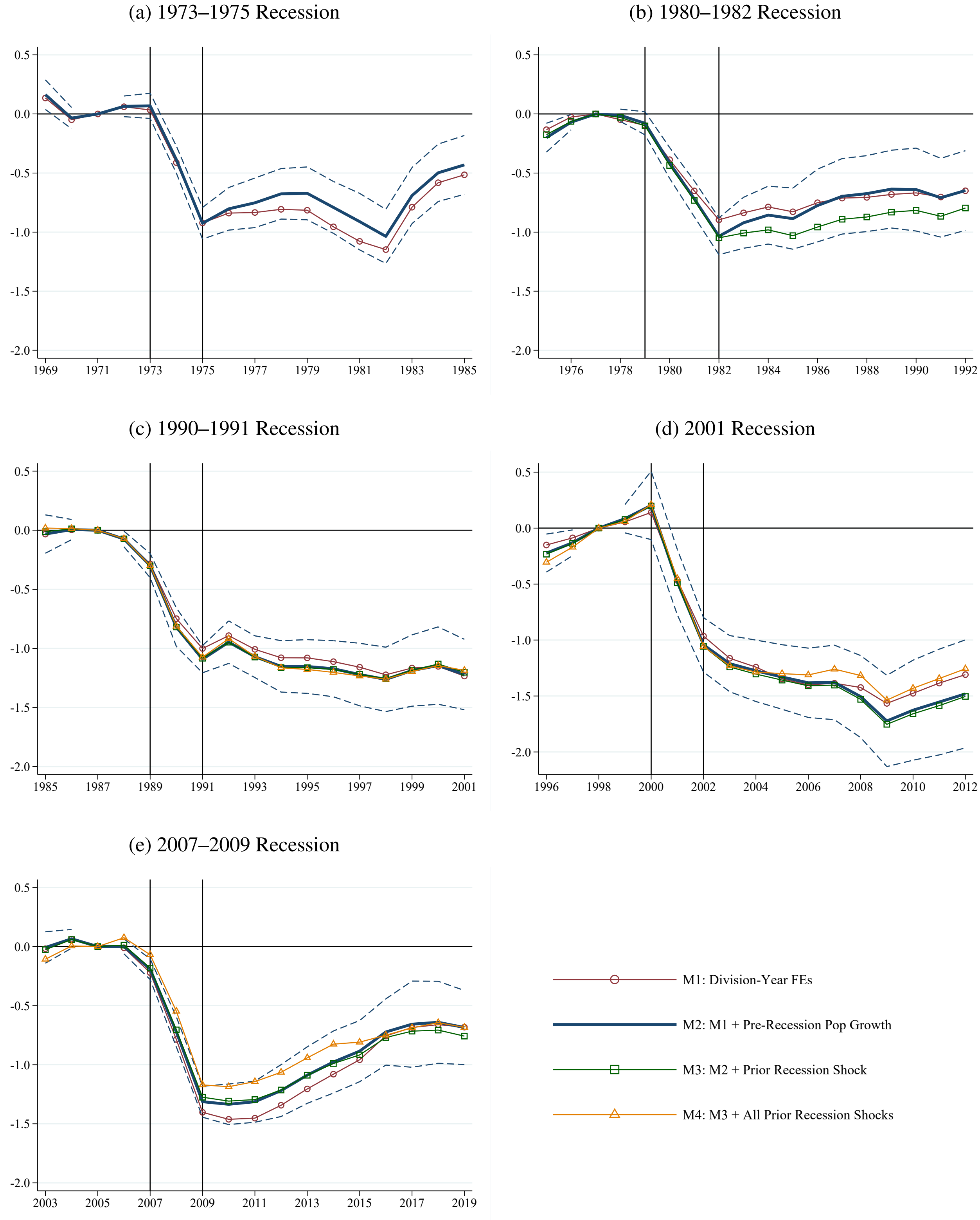


NOTE: The figure shows estimated kernel densities of the log wage and salary employment change for each of the five recessions between 1973 and 2009. In Panel A, log employment changes are demeaned for each recession using the unweighted average across metros.
SOURCE: Authors' calculations using BEAR data.

Figure A.4: Impacts of Log Employment Decreases during Recessions on Metropolitan Area Log Real Earnings per Capita and Implied Changes via Shifts in Age Structure, by Recession

NOTE: Figure reports estimates of Equation (1), separately for each recession, for the dependent variable of log real earnings per capita and predicted effects on earnings due to the recession-induced impacts on the age structure. Standard errors are clustered by metropolitan area and 95 percent confidence intervals are shown. See notes to Figure 2.
SOURCE: Authors' calculations using BEAR and SEER data.

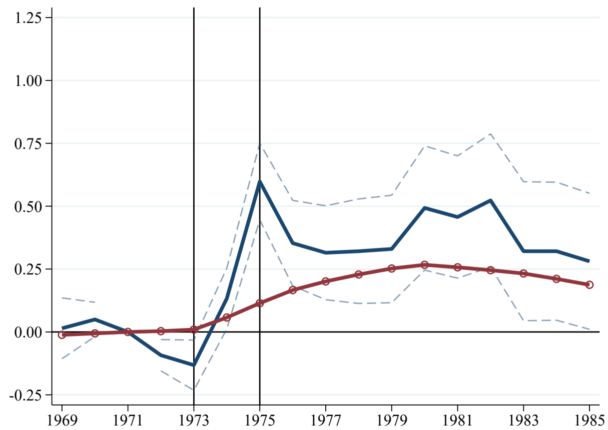
Figure A.5: Impacts of Log Employment Decreases during Recessions on Metropolitan Area Log Real Earnings per Capita, Robustness to Different Specifications



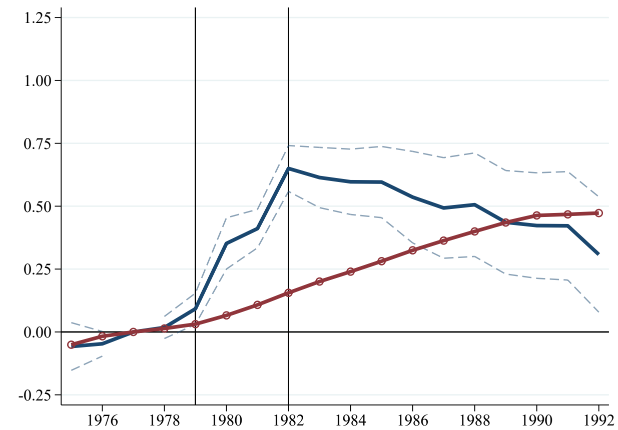
NOTE: Figure reports estimates of variants of Equation (1) for the dependent variable of log real earnings per capita, separately for each recession. Specification M1 contains division-by-year fixed effects in the vector of control variables $x_{i,t}$. Specification M2 is our baseline, which also contains interactions between prerecession population growth and year indicators. Specification M3 adds interactions between the previous recession's log employment change and year indicators. Specification 4 further adds interactions between *all* previous recessions' log employment change and year indicators. See notes to Figure 2.
SOURCE: Authors' calculations using BEAR and SEER data.

Figure A.6: Impacts of Log Employment Decreases during Recessions on Metropolitan Area Log Real Transfers per Capita and Implied Changes via Shifts in Age Structure

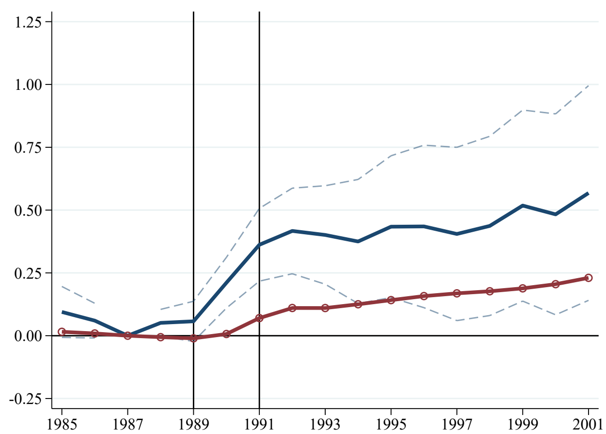
(a) 1973–1975 Recession



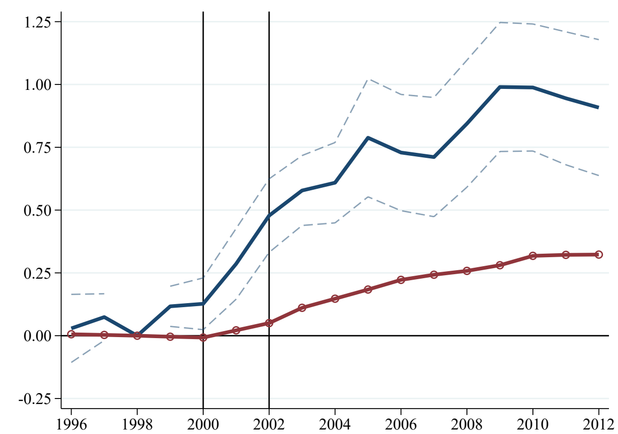
(b) 1980–1982 Recession



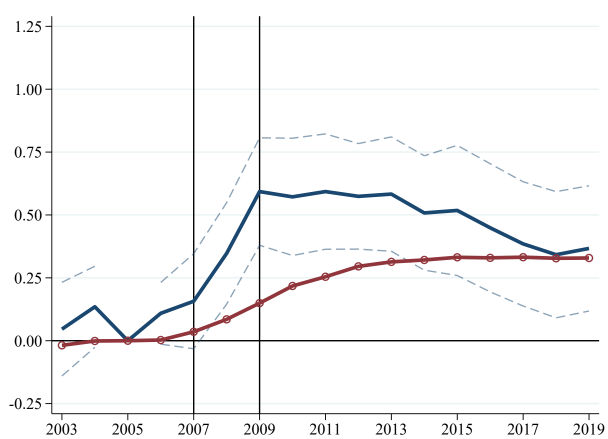
(c) 1990–1991 Recession

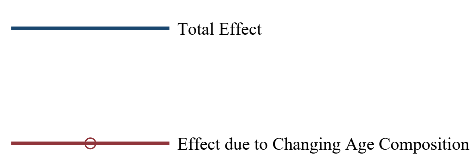


(d) 2001 Recession



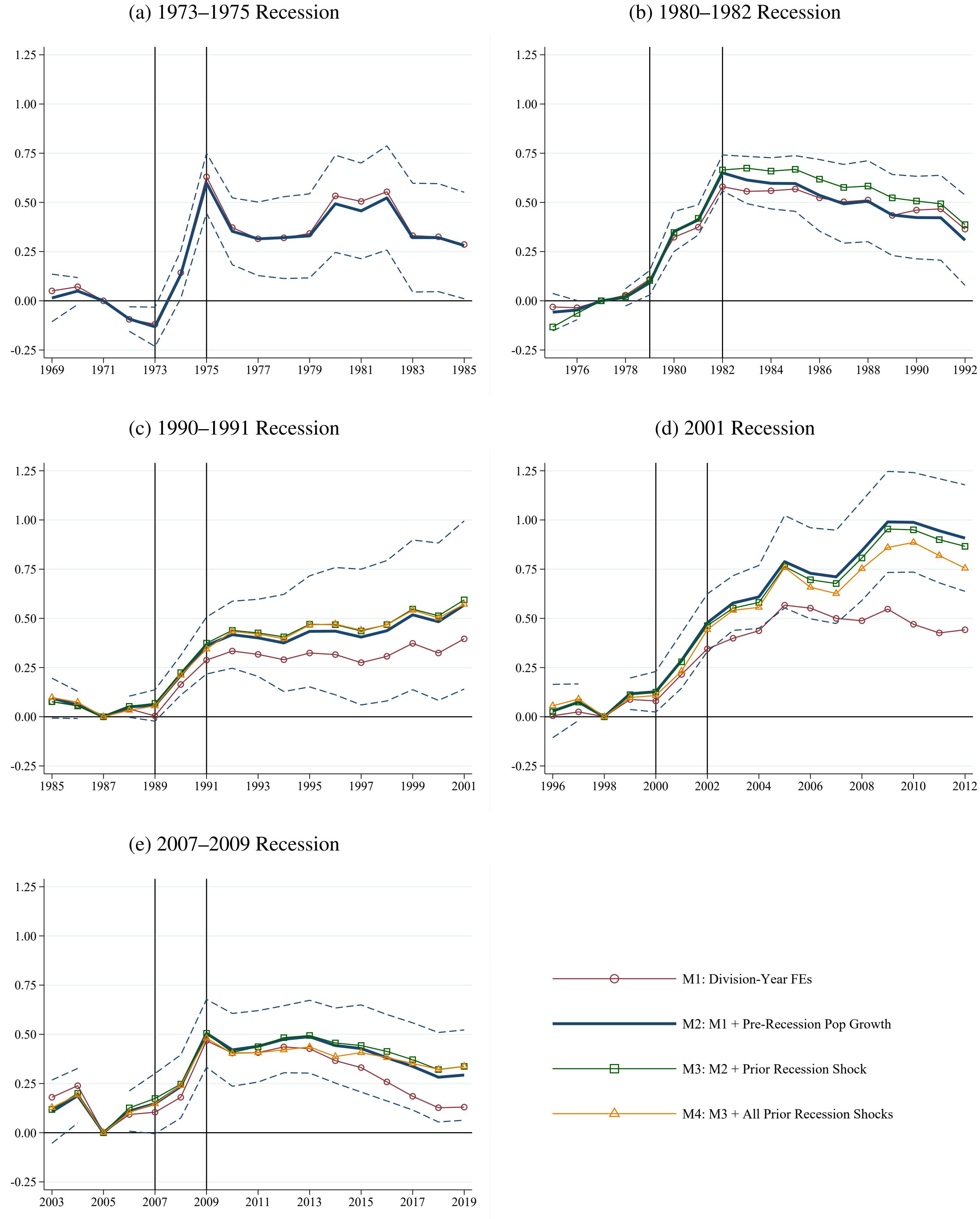
(e) 2007–2009 Recession





NOTE: Figure reports estimates of Equation (1), separately for each recession, for the dependent variable of log real transfers per capita and predicted effects on transfers due to the recession-induced impacts on the age structure. See notes to Appendix Figure A.4.
SOURCE: Authors' calculations using BEAR and SEER data.

Figure A.7: Impacts of Log Employment Decreases during Recessions on Metropolitan Area Log Real Transfers per Capita, Robustness to Different Specifications

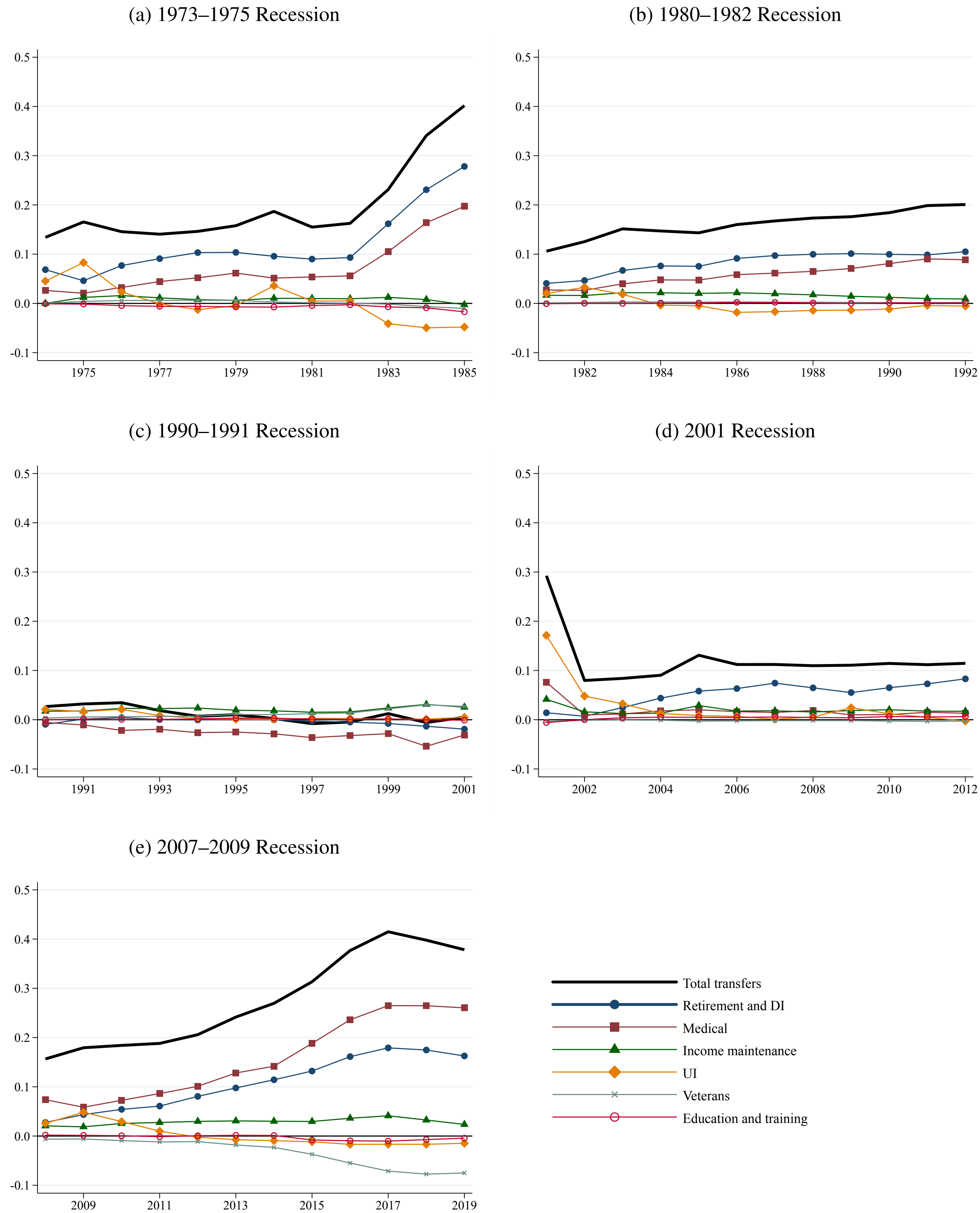


NOTE: Figure reports estimates of variants of Equation (1) for the dependent variable of log real transfers per capita, separately for each recession. See notes to Appendix Figure A.5.
SOURCE: Authors' calculations using BEAR and SEER data.

Figure A.8: Impacts of Log Employment Decreases during Recessions on Metropolitan Area Real Transfers per Capita, by Category and Recession

NOTE: Figure reports estimates of Equation (1), separately for each recession. The dependent variable is log transfers per capita for the indicated category. Standard errors are clustered by metropolitan area and 95 percent confidence intervals are shown. See notes to Figures 2 and 4.
SOURCE: Authors' calculations using BEAR and SEER data.

Figure A.9: Impacts of Log Employment Decreases during Recessions on Metropolitan Area Real Transfers per Capita Relative to Impact on Real Earnings per Capita, by Category and Recession

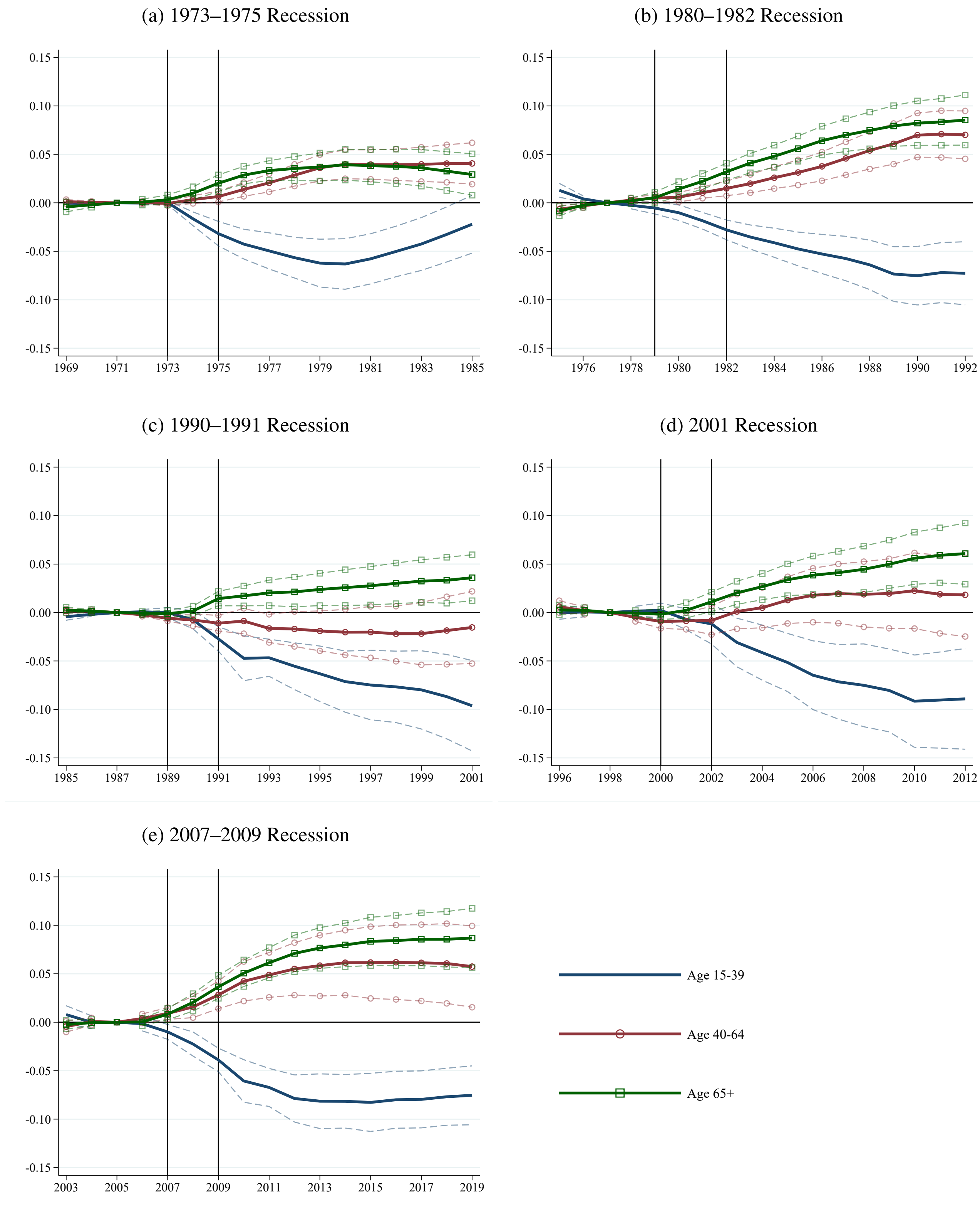


NOTE: Figure reports estimates of Equation (1), separately for each recession. The dependent variable is transfers in the indicated category per capita (in levels). We normalize the impacts by dividing the coefficients for transfers by the coefficients for earnings per capita and multiplying by -100. Standard errors are clustered by metropolitan area and 95 percent confidence intervals are shown. See notes to Figures 2 and 4.
SOURCE: Authors' calculations using BEAR and SEER data.

Figure A.10: Impacts of Log Employment Decreases during Recessions on Metropolitan Area Log Real OAS and DI Transfers per Capita

NOTE: Figure reports estimates of Equation (1), separately for each recession. We display coefficients for log transfers in the indicated category per capita, derived from BEAR and SSA data. See notes to Figure 2.
SOURCE: Authors' calculations using BEAR, SEER, and SSA data.

Figure A.11: Impacts of Log Employment Decreases during Recessions on Metropolitan Area Age Structure



NOTE: Figure reports estimates of Equation (1), separately for each recession. The dependent variables are the shares of the population that are ages 15–39, 40–64, and 65+ (0–14 is omitted). See notes to Figure 2.
SOURCE: Authors' calculations using BEAR and SEER data.

Figure A.12: Impacts of Log Employment Decreases during Recessions on Metropolitan Area Log Retirement and Disability Transfers per Capita and Implied Changes via Shifts in Age Structure

NOTE: Figure reports estimates of Equation (1), separately for each recession, for the dependent variable of log real retirement and disability transfers per capita and predicted effects on transfers due to the recession-induced impacts on the age structure. See notes to Figure 2.
SOURCE: Authors' calculations using BEAR, SEER, and SSA data.