"Choose the Plan That's Right for You": Choice Devolution as Class-Biased Institutional Change in U.S. Employer-Sponsored Health Insurance

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Abstract: This study examines the distributional consequences of U.S. employers' efforts to devolve responsibility for managing their employees' medical insurance risk. The logic of consumer choice has increasingly come to dominate insurance benefit design, requiring that employees learn to be their own actuaries. We ask, to what extent does the individuation of choice (between insurance plans with disparate levels of cost-sharing) alter the social stratification of out-of-pocket (OOP) medical expenditure burdens across socioeconomic status class strata? Our analysis draws on an insurance claims database from a large multi-employer commercial insurer, which includes information on plan offerings and realized OOP expenditure burdens for more than 37 million persons from 2002 to 2012. Consistent with expectations, the results of pooled difference-in-difference event study models reveal that transitions to devolved choice result in modestly greater increases in realized OOP burden among lower socioeconomic status enrollees, compared with the growth among higher-status enrollees. However, the magnitude of the increase in the between-class expenditure burden disparity is small in substantive terms.

Keywords: risk; privatization; health insurance; medical expenditures; stratification; administrative data

TWENTY-FIRST-CENTURY institutional change in the United States and other advanced capitalist societies is characterized by pervasive processes of individuation. Weakening buffers between individuals and market forces have left households exposed to greater economic risks and more frequent dislocations (Hacker 2006; Porter 2012; Western et al. 2012; Morduch and Schneider 2017). At the same time, widespread devolution in both public and private systems of social provision means that individuals are expected to take ever more direct responsibility for *managing risks* and allocation decisions across domains such as retirement planning, health insurance, choosing a school for their children, and investing in higher education (Le Grand 2007; Langley 2008; Zalinsky 2008; O'Rand 2011; Gabe, Harley, and Calnan 2015; Rich and Jennings 2015; Gruber 2017; Young and Chen 2020; Kline and Pais 2021). Increasingly, social benefit provision is accompanied by high-stake demands to "choose the plan that's right for you." Zelinksy (2008) argues that the diffusion of these arrangements has rendered the United States into a "defined-contribution society." In the case of health insurance, this means learning to be one's own actuary by choosing from among plans with varying risk and cost profiles.

The devolution of responsibility onto individuals carries significant but largely unexplored implications for social stratification and inequality. Devolved choice

opens room for greater variation in outcomes. And by requiring that actors *self-select* into particular risk arrangements (e.g., investment portfolios, insurance contracts), it also alters the mechanisms by which risks are distributed. Allocations that had previously been bureaucratically managed—and hence a function of one's inclusion in broad categorical classes (e.g., citizenship, place of residence, occupational class, employment status, age, etc.)—are instead increasingly mediated through individuals' own choices.

Whereas prior theoretical work has often viewed such individuating processes as displacing class-based stratification (Beck and Beck-Gernsheim 2002), we hypothesize instead that individual choice in social welfare institutions exacerbates between-class inequality by generating disproportionately less optimal matching of actors and options within lower socioeconomic strata. Actors in different social positions have uneven resources to draw on when navigating complex decisions such as choosing insurance plans. Because devolved choice foists the burden of responsibility onto individuals, it renders consequential all of the preexisting disparities in their decision-making capacities (Curran 2013). On average, higher-status actors will be better equipped to adapt to such transformations by drawing on routines and social resources that allow them to more closely approximate the calculative behavioral logics that devolved choice demands.

This is not an entirely novel argument. Scholars and critics often contend that the costs and burdens of individuated consumer choice systems will be borne by the most economically vulnerable (e.g., Bloche 2007; Bhargava and Loewenstein 2015; Krugman 2021). Writing in the *New York Times*, the commentator David Brooks (2016) articulates this thesis, noting that

> The explosion of choice places extra burdens on the individual. Poorer Americans have fewer resources to master decision-making techniques, less social support to guide their decision-making and less of a safety net to catch them when they err. [...] In this way the choice explosion has contributed to widening inequality.

Yet we have very little empirical evidence on the distributional consequences of expanded choice in social benefit systems. Assessments have been hampered by a lack of longitudinal data and by the difficulty of disentangling choice devolution from other contemporaneous changes. These features make it difficult to define an operative counterfactual against which to compare observed disparities under an individualized choice regime. For instance, observational studies of portfolio allocation in retirement plans or plan selection in marketplaces established by the Patient Protection and Affordable Care Act (ACA) often find that lower-status actors have more difficulty navigating plan selection compared with higher-status actors. However, because those actors were not typically observed under prior regimes, it is often not clear to what extent the shift to choice-based allocation heightens stratification over and above the status quo ante. This is, of course, a more general issue in post-treatment studies of the distributional effects of organizational allocation practices (e.g., Castilla and Bendard 2010:544).

This article develops and tests a theory of choice devolution as class-biased institutional change by analyzing how the introduction of choice in employer-sponsored health insurance alters the distribution of realized out-of-pocket medical

expenditure burdens among employees. Offering employees the choice of plans with varying risk profiles is touted as a means to reduce costs while also matching consumers to plans that better meet their needs. However, the prospect of lower monthly premiums can lure actors into plans that carry greater financial risks. Our analysis focuses on the period from 2002 to 2012, a time characterized by both widespread diffusion of devolved choice in employer-sponsored benefit design and rapid growth of out-of-pocket (hereafter OOP) spending. From 2004 to 2014, annual deductible billings among the privately insured tripled, and coinsurance billings doubled (Claxton et al. 2016). Meanwhile, every year from 2002 to 2012, approximately two to four percent of firms that had offered traditional low-deductible (lower risk) plans transitioned to offering employees a choice between at least one high-deductible plan (higher risk) and one low-deductible plan (authors' calculation from claims data).[1] We hypothesize that when beneficiaries are confronted with a situation where they must select among plans with varying levels of financial risk, actors with lower socioeconomic status (SES) will end up experiencing greater relative increases in OOP burden compared with higher-SES actors.

Study Site: Plan Choice in Employer-Sponsored Insurance

We focus on the distributional effects of devolved choice in the context of U.S. employer-sponsored insurance (hereafter ESI) for both substantive and methodological reasons. First, the fact that the U.S. health insurance system remains predominantly employer-based means that transformations within ESI carry implications for the financial security of a large portion of the population. Despite retrenchment of employer benefits since the 1990s, between 56 and 66 percent of the under-65 U.S. civilian population was covered by ESI during our study period from 2002 to 2012, including more than 40 percent of adults in the bottom half of the household income distribution circa 2012 (Rae et al. 2020).[2] More recently, ESI coverage has remained relatively stable even in the wake of potentially destabilizing reforms associated with the ACA. Although the ESI-covered population includes few poor Americans,[3] the present study site effectively allows us to gauge the differential effects of choice devolution across the upper two-thirds of the SES distribution.

Second, household medical expenditure burden is an important outcome insofar as OOP healthcare costs represent a key source of financial strain and stratification in the United States (e.g., Collins et al. 2014; Pollitz et al. 2014). Throughout the latter twentieth century, ESI coverage afforded beneficiaries a relatively privileged degree of protection from the financial risks of medical care. Even as employee and employer contributions to premiums rose steadily, OOP expenditure burdens were concentrated primarily among the uninsured. Since the mid-2000s, however, the growth of cost-sharing has led to a sharp rise in OOP expenditures even among the stably employed, continuously insured population (e.g., Herrera et al. 2013; Claxton et al. 2016). Among households covered by ESI plans, the share with *realized* OOP expenses in excess of 10 percent of income (or five percent of income

for those below 200 percent of the federal poverty level) increased from nine percent in 2002 to 16 percent in 2013 (Collins et al. 2014). Prior to the 2014 implementation of the ACA, one third of Americans reported that they "struggle to pay medical bills," of whom 70 percent were insured (Pollitz et al. 2014). A 2014 analysis by the Consumer Financial Protection Bureau found that 43 million Americans had unpaid medical debt on their credit report and that medical debt accounts for 52 percent of all delinquent accounts on credit reports. This context of rising OOP expenditure risks is important for the present study insofar as it heightens the financial stakes of individuals' choices.

Finally, ESI offers an analytically advantageous site to study the relationship between choice devolution and stratification of medical expenditure burdens. Longitudinal insurance claims data allow us to observe how the same individuals in a common employer group fare before and after employers' transitions to choice-based benefits. This pre-post design overcomes the censoring problem that arises when given subjects are observed only in a post-treatment choice-based environment. We can also exploit the large number of employers in order to compare the distributional consequences of transitions to plan choice with the consequences of "full-replacement" transitions to high-deductible plans (wherein the employer moves all employees to high-deductible plans with no choice). This comparison allows us to disentangle whether the devolution of choice affects stratification above and beyond the devolution of risk-bearing in the form of mandated increases in cost-sharing for medical care.

Choice and Risk in Employer-Sponsored Health Insurance

It is important to clarify that our interest in plan choice is focused specifically on choice between plans with varying levels of financial risk to the employee. Employers, particularly larger employers, have long offered multiple health plan options, such as point-of-service indemnity plans, preferred provider organization (PPO) networks, and health maintenance organization (HMO) plans. Until the mid-2000s, these options varied primarily in terms of provider networks, reimbursement arrangements, and specialist referral requirements, but not financial risk (Schone and Cooper 2001). Within an employer, employees' cost-sharing obligations (deductibles and coinsurance) rarely differed across plans.

Since the mid-2000s, the rapid expansion of high-deductible plans and coinsurance has made financial risk an increasingly salient dimension of plan choice (Ericson and Sydnor 2017). Based on the metric we derive from the claims data, during each year from 2002 to 2012, approximately two to four percent of firms that had offered traditional low-deductible plans transitioned to offering employees a choice between at least one high-deductible plan and one low-deductible plan. Figure **??** shows the cumulative growth in the share of ESI enrollees in the sample data set who faced a choice between at least one high-deductible plan and one low-deductible plan. The share grew from virtually zero in the early 2000s to more than 39 percent by 2012.[4] These trends are similar to those in the widely cited Kaiser Family Foundation/Health Research and Educational Trust (HRET) Employer Health Benefits Survey, which shows that by 2013, 43 percent of all covered
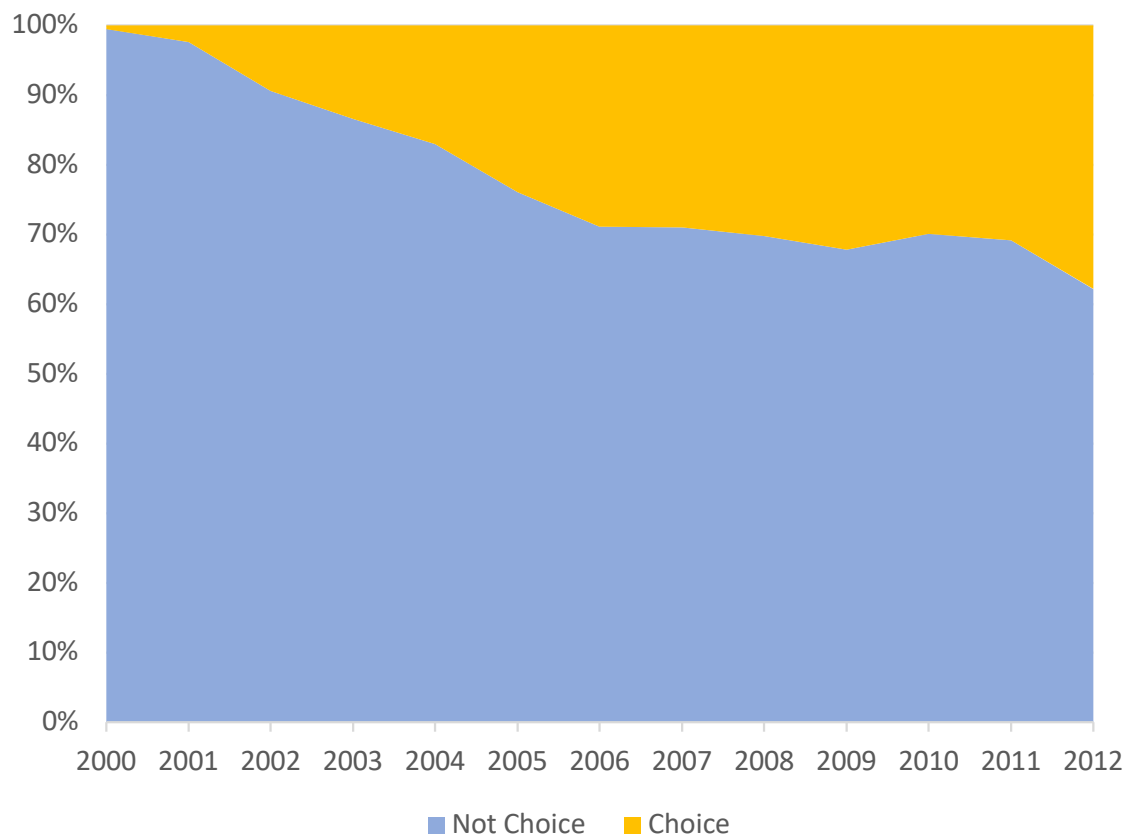
Figure 1: Share of ESI enrollees who face a choice of multiple health insurance plans with uneven levels of financial risk. *Notes:* Data source: commercial claims data set. Choice employers are defined as those who offer at least one low-deductible plan, and one high-deductible plan. Thresholds for low- and high-deductible levels are based on the IRS's cutoffs for health savings account eligibility.

employees were at employers that offered a high-deductible health plan (HDHP), and 77 percent of those (or 33 percent of all ESI-covered workers) were at employers where HDHP were offered as choice alongside other plans (authors' calculation).

The turn toward consumer choice in ESI has been driven by technocratic critiques of the inefficiencies of bureaucratic allocation (Fuller 2015), as well as by broad currents of cultural-institutional demand for policies that afford greater personalization and individual autonomy (e.g., Zelinsky 2008; Bromley and Meyer 2015). Even more importantly, choice devolution was fueled by employers' interest in staunching the persistent growth of employee benefit expenses: incentivizing employees to shift the locus of economizing and risk burden onto themselves ("skin in the game") in return for lower premium payments offered employers a means to contain costs while avoiding much of the backlash that had characterized previous rationing efforts such as the 1990s-era "managed care" model (Gabe et al.).[5] This expansion of consumerism in health insurance is also meant to be complementary with a broader shift to consumerism in healthcare *provision*, as activated patient-

consumers are encouraged not only to manage risks by selecting optimal benefits but also exercise market discipline on providers by researching and "shopping around" for medical services (Young and Chen 2020).

Devolved Choice as Class-Biased Institutional Change

The confluence of increased medical care costs and increased choice from among plans with varying risk profiles has left more employees facing high-stakes choices between plans. We are interested in whether expanded choice differentially affects the realized OOP burdens of persons in different socioeconomic strata. Our basic argument is that the devolution of choice operates as a stratifying mechanism insofar as it foists responsibility onto actors who bring to these complex decisions uneven stocks of resources and constraints.

Before turning to the specific mechanisms, it is worth pointing out that the argument developed here might appear at odds with the some of the prior empirical literature on plan choice behaviors. *On average*, younger, healthier, and wealthier actors are more likely than less healthy and lower-income actors to choose the higher-risk high-deductible plans when offered a choice (McDevitt et al. 2014; Bundorf 2016). Advocates of devolution point to this as evidence that consumer choice is *not* luring the most vulnerable into financially risky positions. From the standpoint of social inequality and stratification, however, the question is not which employees are most likely to choose which plans ex ante, but rather for whom devolution of responsibility results in less optimal matching of persons to plans, which is only observable ex post. In other words, does the individuated matching of persons to plans under a devolved choice system differentially benefit some groups over others, relative to a context with all low-deductible plans, or relative to a context in which employers move everyone to a high-deductible plan?

Cultural Capital and Decision Capabilities

There are several mechanisms by which devolved choice would produce comparatively more efficient allocation among higher-SES actors. One is differences in comprehension and decision capacity associated with SES. This follows from sociological theories of cultural capital, which emphasize the roles of socialization, tacit knowledge, and transposable repertoires in helping actors navigate novel or uncertain economic situations (Bourdieu 2005). In short, higher-status actors will be better equipped to adapt to an institutional context where everyone is expected to be their own actuarial agent, and they will be more disposed to act in accordance with the behavioral logic that these institutions presume (Langley 2008).

Health insurance contracts are exceedingly complex and esoteric (Loewenstein et al. 2013; Sanger-Katz 2020). Choice-based architecture requires that individuals grapple not only with uncertainty and risk but also with arcane cost-sharing concepts such as deductibles, coinsurance, copayments, OOP maximums, preferred versus non-preferred providers, and pharmaceutical formularies. It also demands that actors engage in forms of actuarial calculation that are quite foreign to the situated, pragmatic rationality they typically deploy in their day-to-day economic

lives. Surveys consistently find that between 25 percent and 60 percent of insurance consumers do not understand basic cost-sharing concepts, and an even smaller percentage can accurately estimate the OOP liabilities associated with common hypothetical utilization scenarios under various plan structures (e.g., Loewenstein et al. 2013; Norton, Hamel, and Brodie 2014).

Given this complexity, those whose educational or occupational backgrounds have given them more experience with calculative tasks and managing financial risk will be comparatively better equipped to parse alternative plan options. Higher-status actors are more likely to be able to draw on resources and repertoires gleaned from other domains, allowing them to approach plan choices with a clearer grasp of the tradeoffs. They are also more likely to be able to draw on social ties for experienced guidance (DiMaggio and Garip 2011) and/or more disposed to leverage decision aids such as input from human resources specialists (Greene et al. 2006).

Prior research highlights clear socioeconomic disparities in insurance comprehension, selection processes, and choice outcomes. Loewenstein et al. (2013) find that more highly educated and higher-income respondents accurately answer more questions about basic insurance concepts, irrespective of their prior experience with healthcare providers. Norton et al. (2014) report similar disparities in comprehension across educational attainment categories.[6]

In addition to being more informed, prior work suggests that higher-status actors are also more likely to engage in the sort of prospective cost-estimation calculations that consumerism demands. Johnson et al. (2013) assess respondents' abilities to select the most cost-effective option from among a menu of hypothetical plans. Using a stratified design, they compare a diverse population sample of respondents (65 percent without college degree) with a high-status sample of MBA students with career backgrounds in finance or consulting. The higher-status group selected the most cost-effective plan 74 percent of the time, versus 47 percent for the general sample. Tellingly, the majority of high-status subjects reported using Excel sheets and other calculative aids to assist in their selection, and these subjects tended to perform especially well, selecting correctly 85 percent of the time.

Greene et al. (2006) report similar findings from an interview study comparing the plan choices of hourly and salaried workers at a large industrial firm. Salaried employees who selected an HDHP tended to do so after projecting their liabilities based on their expected utilization. Several reported proactively contacting pharmacies or the insurer to confirm coverage. Although lower-status wage workers were less likely to select the HDHP plan, those who did tended to rely on more heuristic shortcuts. For instance, one respondent reported that he chose the HDHP because the plan's name included the word "Plus," which he supposed was an indication that it was a "better" plan. In each of the above-cited studies, members of the higher SES group (MBA students in the former and salaried employees in the latter) were able to draw on their existing fluency with technological aids such as Excel spreadsheets in order to make more calculated choices.

Beyond disparities in comprehension, difficulties navigating insurance choices are further compounded by the fact that the actual menu of choices offered to employees does not always conform to the idealized, rationalized tradeoff between price and risk. Liu and Sydnor (2017) find that 65 percent of large firms offered some

plans that were suboptimal ("dominated" in the economics vernacular) regardless of employees' risk preferences. Thus, rather than giving employees an actuarily equivalent tradeoff between OOP risk and greater monthly premium cost, choice in such cases presents employees with traps where some plans are characterized by greater expected monthly premium cost *and* greater OOP risk. Such distortions in plan design will tend to exacerbate the disparate financial effects of less efficient selection among lower-SES actors by heightening the economic costs of choosing the "wrong" plan.

Bhargava et al. (2015) exploit data on one such firm in order to examine plan selection behavior in cases where some plans are strictly dominated. Although the majority of employees (61 percent) chose one of the dominated plans, lower-income employees were significantly more likely to choose a dominated plan. Lower-income employees were also *less likely* to switch out of dominated plans during the following year, costing them an excess of four percent of their annual income on average. The authors conclude that "the burden of complex insurance decisions may disproportionately affect the most financially vulnerable."

Overall, prior research suggests that higher SES individuals are more likely to possess resources that allow them to avoid the hazards and exploit the benefits of consumer choice by making concerted selections, whereas lower SES actors are more likely to be left making more haphazard choices. Lower-status actors thereby have a higher probability of ending up in a poorly suited plan, with the result that lower-status actors will end up bearing disproportionately greater increases in cost burdens following employer transitions to devolved choice.

Affordability Constraints

The above discussion focuses on disparities in decision-making resources. A second complementary mechanism hinges on the fact that, even in the absence of socioeconomic differences in choice capacity, actors are unevenly constrained in their ability to act on a preferred choice (Rich and Jennings 2015; Mulligan 2017). Premium affordability constraints may compel some lower-income employees to select HDHPs over plans with higher monthly premiums, even when they might ideally prefer a less risky plan. In general, lower SES respondents tend to avow a *less* positive disposition toward financial risk-taking (Fligstein and Goldstein 2015). Nonetheless, lower monthly premiums in HDHPs may be especially tempting for low-wage employees who are already burdened with high monthly expenses. Studies of take-up show that lower-income households are highly sensitive to monthly premiums (e.g., Abraham et al. 2006). When faced with hundreds of dollars in premium savings, some may feel that they have no choice but to take their chances with the higher-deductible option. Affordability constraints will thereby disproportionately distort lower-SES actors' plan selections.

Prior research provides some indirect evidence that this mechanism is operative in ESI. On average, those who select an HDHP tend to be younger, healthier, and with higher income (Bundorf 2016). However, the few studies that examine social class heterogeneity tell a more complex story: using wage versus salaried status to proxy social class, Greene et al. (2006) find differences in predictors of

HDHP enrollment across groups: among the salaried classes, younger, healthier, higher-income, and more educated employees were more likely to choose the high-deductible plan. Among non-salaried workers, however, the age and income associations reverse: lower-income and older workers (who are typically poor candidates for HDHPs) were more likely to select the high-deductible plan.

Socioeconomic Differences in Health Status

Finally, a third mechanism follows from the simple fact that carving up an insurance pool into risk-stratified groups tends to reward the healthier members (Rosenthal and Daniels 2006). Individuals' need for health services is not randomly distributed with respect to SES. Ceteris paribus, higher-SES persons tend to have fewer chronic conditions or morbidities. One attraction of HDHPs is that they allow healthier people to save on monthly premiums, with a lower comparative risk of experiencing high OOP costs (because they are less likely to end up needing extensive medical care). The ability to exploit this cross-subsidization from the less healthy to the more healthy will disproportionately benefit high-SES employees in a choice-based context. However, effects of this third mechanism will be most clearly reflected in total expenditures (including both OOP costs and employee contributions to premiums).

Data and Methods

Our analysis draws on panel data from a deidentified multi-employer insurance claims database spanning the period from 2001 to 2012 (Wharam et al. 2017, 2019, 2020). The database covers all persons enrolled in employer-sponsored health plans through a single, large U.S. insurer.[7] The full database includes 8 to 11 million person records per year from 50,000 to 55,000 employers per year, including small employers and larger self-insured employers. It thus provides a large, closely representative sample of the commercially insured U.S. population.

The analytic sample for our main analysis includes 1,192,721 enrollees and adult dependents at 8,456 employers that underwent a transition from traditional "low"-deductible plans to devolved choice of plans at some time from 2002 to 2012. Individuals are observed on average for 5.2 years (N person-year observations = 6,146,143). The duration of observation is limited to the period in which the person was enrolled in the employer's health insurance plan and is further limited by censoring of the data sample. We exclude partial year patient-ID observations with fewer than 12 months of data for the plan year. We also exclude persons below age 24 and above age 64. For the purposes of the main analyses, we treat each adult (enrollees and dependent spouses) as a separate individual unit. Substantively identical results were obtained using per capitated families (including child dependents) as units of analysis.

Measuring Expenditure Burdens

Our outcome of interest is total realized annual OOP expenditure burden. To calculate OOP expenditure for each enrollee, we summed their total billed OOP medical and pharmacy amounts across the full plan year. This includes payments credited to deductibles, coinsurance, or copayments. Annual figures reflect the final *billed OOP liability* after any adjustments. OOP figures are deflated to year 2000 constant dollars using the deflator based on the Consumer Price Index for All Urban Consumers.

Our main analyses adhere to the standard definition of OOP burden by *not* including employee contributions to premiums. Of course greater OOP liabilities among those who select high-deductible plans are expected to be offset by lower premium payments in the aggregate. Unfortunately we lack precise data on employee contributions to premiums. In secondary analyses we adjust OOP estimates to account for estimated premium cost saving using imputed employee premium contributions. Imputations are based on data from the Kaiser Family Foundation/HRET Employer Health Benefits Survey, which breaks down mean employee contributions to premiums for both HDHP and traditional PPO/HMO plans by year, single versus family coverage, firm size, and region cells. Based on these variables, we generate a predicted level of premium savings for high-deductible enrollees relative to traditional PPO/HMO plan enrollees at each choice employer. We then subtract these savings from the reported OOP burden for those enrolled in an HDHP.

Measuring Choice Devolution

The primary employer-level variable of interest is a time-varying annual derived indicator for whether the firm offers traditional "low"-deductible plans exclusively, high-deductible (HDHP) plans exclusively, or a choice of plans that include low and high-deductible options (Wharam et al. 2017, 2019, 2020). For the purposes of this analysis, an "employer" is defined by a group of enrollees who share a common group ID and/or common set of insurance benefit offerings in a given year, that is, a common choice set. We are not interested in the sheer number of specific plan choices. Rather, the operative indicator is whether or not employees face a *choice between plans with uneven levels of financial risk* (at least one high-deductible option and one low-deductible option). For instance, firms that offer multiple low-deductible plan options are *not* treated as choice firms for the purposes of this analysis.

We define high deductibles based on the *minimum* deductible threshold that would qualify as a health savings account–eligible plan under IRS rules. At the beginning of our study period this was $1,000. We defined high-deductible firms as those where all offered deductible levels exceeded this threshold. Low-deductible firms are defined as those where all deductibles are below $500. Choice employers were defined as those with multiple deductible levels, at least one of which is above the threshold and one below. Our main analysis is confined to enrollees at firms that undergo a transition from *low* to *choice*. The incidence of employer choice transitions in the sample is shown in Figure **??** below.
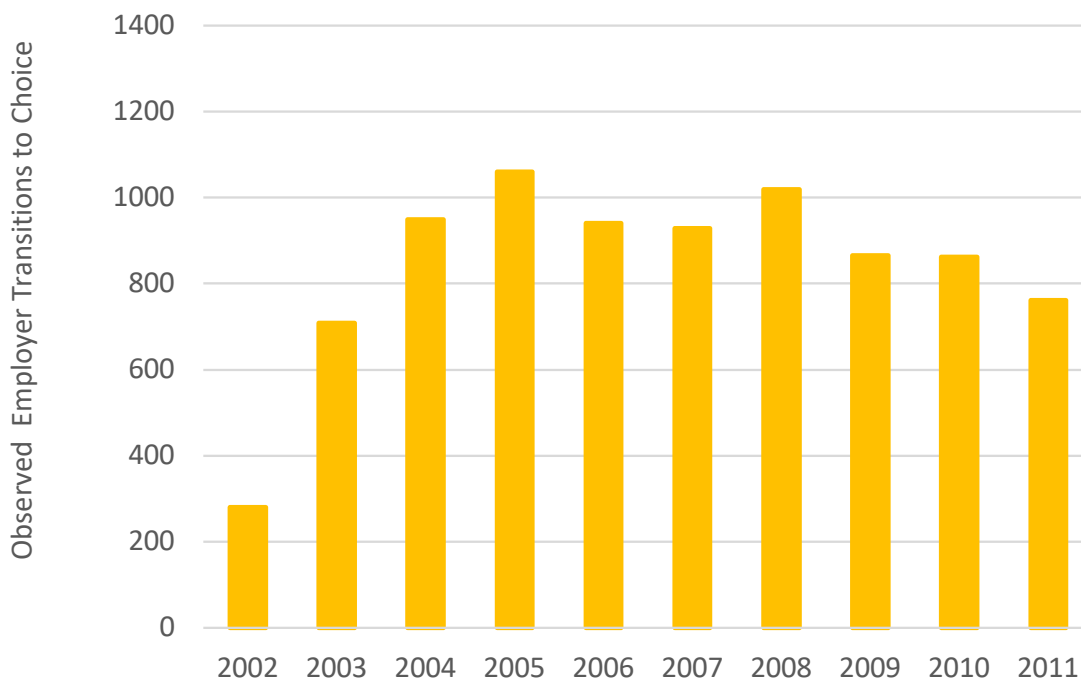
Figure 2: Annual incidence of employer transitions to devolved plan choice in analytic sample, 2002 to 2011. *Notes:* Data source: commercial claims data set.

Construction of the time-varying deductible type measure is complicated by the fact that detailed administrative information on employer plan offerings is only available for a subset of employers. For small employers (fewer than 100 employees) and some midsized employer groups (100 to 1,000 employees), we were able to code the availability of choice directly from administrative linkages. For larger employers we relied on observed clustering patterns of in-network and out-of-network deductible charges in the claims data to impute deductible cutoffs within each employer group. This procedure was developed by the second author's research group (Wharam et al. 2017, 2019). The logic is that when a sufficient number of enrollees within an employer group exhibit identical annual deductible charges at one or more "round numbers" such as $500.00, $1,000.00, $2,500.00, et cetera, this amount can credibly be deemed to represent an actual plan deductible level for the entire employer group. Specifically, a predictive multinomial logit model is used to impute employer-level deductible levels by incorporating information on the share of enrollees with billed OOP deductible payments at one or more round-number clusters, the proportions of those round-number billings above or below high-deductible thresholds, the proportion of enrollees with health savings accounts (which are only available to those with high deductibles), and proportion of enrollees with reported claims but no payments toward deductibles. Validation analyses using a subset of midsized employers with full benefit details

show that the imputation procedure has a *very high* overall reliability of 98.4 percent (for details on the validation, see the Appendix).[8]

Measuring Socioeconomic Class Status

Like other administrative health records, insurance claims data lack direct measures of enrollees' socioeconomic class status. Researchers have long dealt with this gap by using census tract or block group median of the subject's residential location to proxy individual SES (e.g., Krieger et al. 2005). However, such ecological proxies are subject to substantial measurement error, with reliability in the 0.5-to-0.7 range when classification is based on broad categories such as quintiles (Geronimus and Bound 1998; Diez-Roux et al. 2001; Moss, Johnson, and Yu 2021).

Our analysis instead draws on enrollee household income and education measures supplied by an affiliated consumer data vendor. Compared with census-based ecological proxies, marketing databases also draw on additional individual-specific information contained in public records and credit reports, such as residential property values, occupational licensing databases, presence of student loan debts, credit scores, and total credit limits (Liu et al. 2018). Substituting or augmenting census-based measures with even a single additional household-level or address-level proxy, such as residential property value, can increase household income imputation reliability closer to 80 percent (Nkosi et al. 2011). Past validation studies of proprietary consumer SES estimation models similar to that used here report income bucket classification reliability above 80 percent over the majority of the distribution (Liu et al. 2018). Although not perfect, such measurement reliability is not considerably worse than standard government surveys such as the Current Population Survey or Survey of Income and Program Participation (Meyer, Mok, and Sullivan 2015). We discuss the potential impact of attenuation bias due to measurement error on our estimates in the discussion section below.

Using the vendor-supplied data, we calculated a socioeconomic class index as an equal-weighted average of a four-category educational attainment indicator (high school or less, some college, bachelor's degree, greater than bachelor's degree) and six-category household annual income (less than $40,000, $40,000 to $49,999, $50,000 to $59,999, $60,000 to $74,999, $75,000 to $99,999 and greater than or equal to $100,000, in circa 2012 dollars). For analytic purposes we divided the sample into three groups: high-SES, mid-SES, and low-SES. These correspond to the top 25 percent, the middle 50 percent, and the bottom 25 percent of the sample, respectively. Those in the top quartile "high-SES" category have a college degree and income greater than $100,000, or a post-graduate degree and income greater than $75,000. Those in the bottom quartile "low-SES" category have a high school diploma or less and household income below $59,999, or some college and income below $49,999.

We also experimented with an alternative nonproprietary measure, in which the SES index was constructed from the medians of the census tract where the enrollee's primary address was located, using 2000 Decennial Census data (Krieger et al. 2005). The neighborhood-based approach suffers from less missingness but draws on less individual-specific data.[9] Analyses using the census tract–based measure yielded

substantively similar but smaller effect size estimates, which presumably reflects attenuation bias due to larger measurement error.

Although the data sample is closely representative of the ESI-covered population, it is important to bear in mind that the ESI-covered population is disproportionately tilted toward the top half of the national household distribution of SES (see, e.g., Rae et al. 2020). Thus, the present case study can be seen as analyzing the distributional effects of choice within a constrained portion of the overall population-level stratification structure.

Other Covariates

Other individual-level measures used as conditioning variables in some analyses below include age, state dummy variables, ACG score as a measure of baseline health status prior to choice devolution, and total standardized cost utilization as a measure of the amount of healthcare consumed by an individual. The ACG score is a well-validated measure of individual health risk developed by the Johns Hopkins School of Public Health. It draws on diagnostic, pharmacy, and lab data to quantify predicted future healthcare utilization.

Model Estimation

We estimate the effect of choice devolution on between-SES disparities in OOP burden using an event study design (Jacobson, LaLonde, and Sullivan 1993). This approach captures the extent to which within-person changes in annual OOP burden pre- and post-devolution differ across SES groups. It can be viewed as analogous to a pooled series of difference-in-differences, where time is normalized relative to the treatment event to account for the fact that employers undergo the treatment in different years. The model includes person-fixed effects to account for unobserved heterogeneity (achieved by demeaning each person's annual OOP burden from the pre-devolution baseline index observation) and calendar year-fixed effects to account for secular trends in OOP burden.[10] Specifically, we specify a linear regression model of the following form:

$$y_{it} = a_i + \gamma_t + \sum_{k \geq -m} D_{it}^k \delta_k + \sum_{k \geq -m} (D_{it}^k * Z_i)\lambda_k + \varepsilon_{it},$$

where y is annual real OOP expenditure measured relative to each individual's pre-devolution baseline OOP burden, D is a series of dummy variables indicating time relative to the choice transition event for each subject i, and Z is an indicator for socioeconomic strata, which is interacted with the time to or from event dummies. The interactions between the years before- and after-event dummies and enrollee SES strata indicate how the mean within-person change in OOP burden relative to baseline differs across SES strata. Subject to the identifying assumption that trends in OOP burden for each SES strata would have moved in parallel absent the employer shift to choice, the interactions can be interpreted as the differential effects of choice devolution on changes in SES groups' OOP burden during a given post-treatment year.[11] Given high levels of inertia in individuals' plan selections

(e.g., Gruber 2017), we expect that any stratifying effects of choice devolution would appear over several years rather than instantaneously, as actors slowly sort themselves.

The model described above is estimated only on the subsample who experience the choice transition. In additional analyses, described in greater detail below, we expand the sample to include enrollees at firms that transition from low-deductibles to all-high-deductibles model, and we then add a three-way interaction to the model to compare distributional effects across alternative types of risk privatization (see Figure **??** below).

Given the very large analytic sample sizes ($N = 6.15$ million person-year observations), even substantively insignificant estimates will be statistically distinguishable from zero (Xie and Wu 2005). We thus focus our reporting and interpretation of results below on the substantive significance of the estimated differential changes in OOP burden following employer transitions to deductible choice.

Results

Devolution and Expenditure Burdens across the Socioeconomic Distribution

We begin by assessing our main hypothesis that transitions to devolved choice will result in greater increases in realized medical expenditure burden among lower-SES enrollees compared with higher-SES enrollees. Consistent with expectations, the model results in Figure **??** indicate that when firms switch from offering a low-deductible plan to offering a choice between plans, lower-SES employees experience more rapid growth in OOP burden relative to baseline pre-treatment OOP burden. Within four years, low-SES members' mean annual OOP burden increases $22 more from the person-centered baseline compared with the increase among high-SES members. Given that the mean baseline pre-devolution OOP burden was approximately $340 per person during this period (in year 2000 dollars), another way to interpret the results is that high-SES employees' post-devolution OOP burden increases by approximately 13 percent above the pre-treatment grand mean on average, whereas low-SES enrollees' post-devolution OOP burden increases by approximately 19 percent above the pre-treatment grand mean annually by year four. Although the estimated difference-in-differences between SES groups are substantively small in magnitude, the fact that the disparate impact compounds over time in the aftermath of devolution is consistent with a dynamic of stratified adaptation: OOP burden increases initially for all three SES groups, but it continues growing more for low-SES actors.

Analyzing OOP burden alone might present a downwardly biased picture of devolution's effect on total expenditure burden inequality because OOP burden does not include employee contributions to premiums. When given a choice, higher-SES actors are, on average, more likely to choose HDHPs (Bundorf 2016), which yields them savings in monthly premiums. Thus, an arguably more relevant outcome metric is total medical expenditures (including OOP costs plus employee contributions to premiums). Figure **??** shows the results with OOP levels adjusted
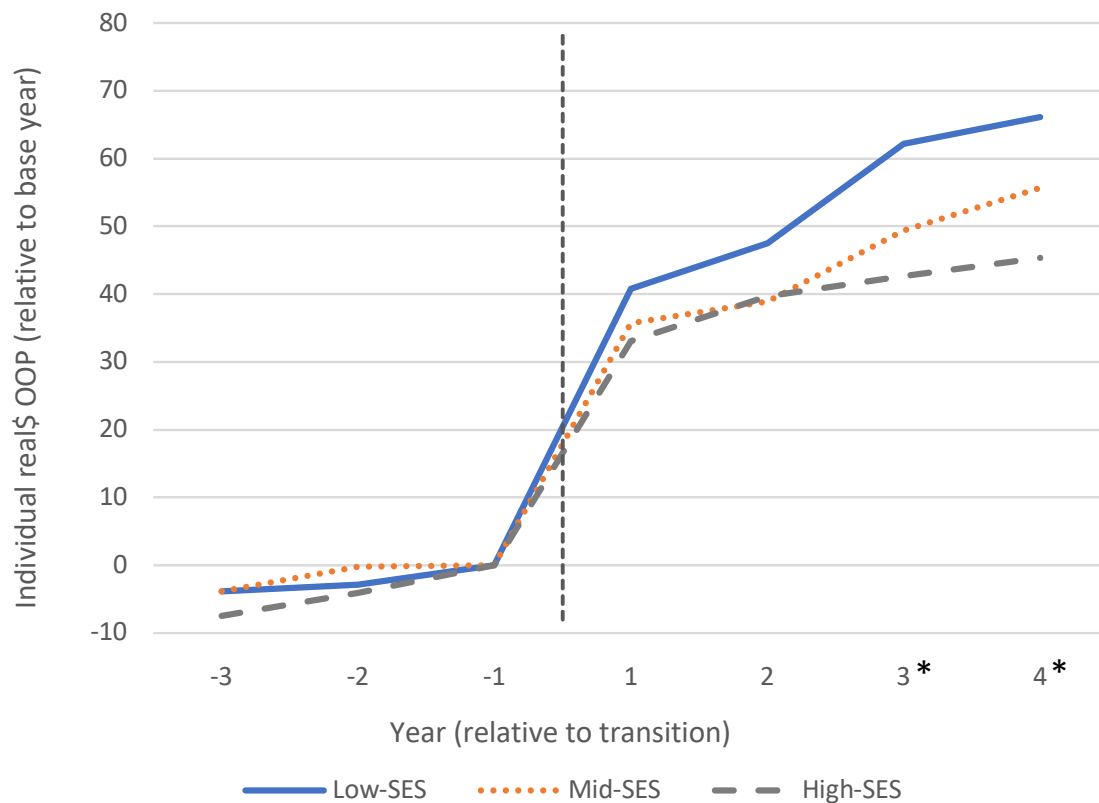
Figure 3: Estimated effects of choice devolution on mean annual OOP medical expenditure burdens by enrollee SES. *Notes:* This figure shows pooled difference-in-difference estimates of changes in OOP medical expenditures among enrollees at firms that transition to devolved choice of insurance deductible level. SES categories correspond to the bottom 25 percent, middle 50 percent, and top 25 percent of the sample distribution. The model is estimated with year-fixed effects and with person-fixed effects centered at the pre-devolution level. $*$ indicates a statistically significant difference between the high- and low-SES groups at $p < 0.01$.

to account for differential premium contributions in low- versus high-deductible plans. These results should be interpreted cautiously given the assumptions of our employee premium contribution imputation technique. Nonetheless, the pattern is markedly similar. Again, we see small increases in between-SES dispersion over the four years following the transition to choice. The trajectory for high-SES employees flattens entirely within a few years, suggesting that actors with more resources learned to manage cost–risk tradeoffs by sorting in a relatively more optimized manner.

We conducted several further extensions. First, because the distribution of expenditure burdens is highly skewed, the full scale of social disparities may be masked in models of the conditional mean. The differential effects of devolved choice may be more pronounced at the tail of the spending distribution. To check this we replicated the event study analysis using a panel quantile regression model
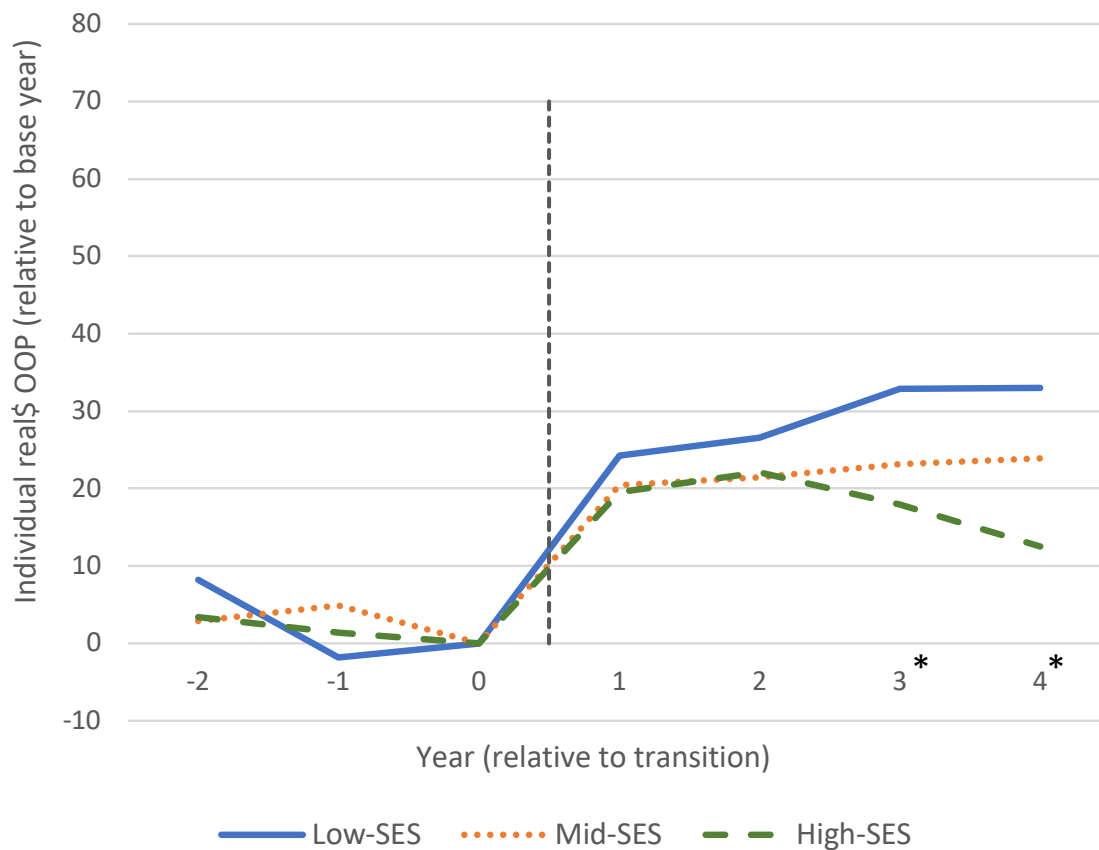
Figure 4: Estimated effects of choice devolution on annual OOP medical expenditure burdens, with premium contribution adjustment. *Notes:* This figure shows pooled difference-in-difference estimates of changes in OOP medical expenditures among enrollees at firms that transition to devolved choice, with an adjustment to account for differential employee contributions to premiums in high- versus low-deductible plans. SES categories correspond to the bottom 25 percent, middle 50 percent, and top 25 percent of the sample distribution. The model is estimated with year-fixed effects and with person-fixed effects centered at the pre-devolution level. ∗ indicates a statistically significant difference between the high- and low-SES groups at $p < 0.01$.

estimated at the 95th percentile of the OOP distribution (Baker 2016; Powell 2022). In a similar vein, we also fit the standard model to a restricted subsample of those in the top quartile of the ACG risk score distribution (measured at baseline). These are the least-healthy persons who are at greatest risk for high healthcare utilization. The results of these two analyses appear in Figures **??** and **??**, respectively. In both cases, the absolute increases in estimated OOP burden are significantly greater than in Figure **??** above, but the direction and relative growth of between-SES dispersion are similar. In other words, devolved choice has a comparably disparate impact across the OOP and health risk distributions.
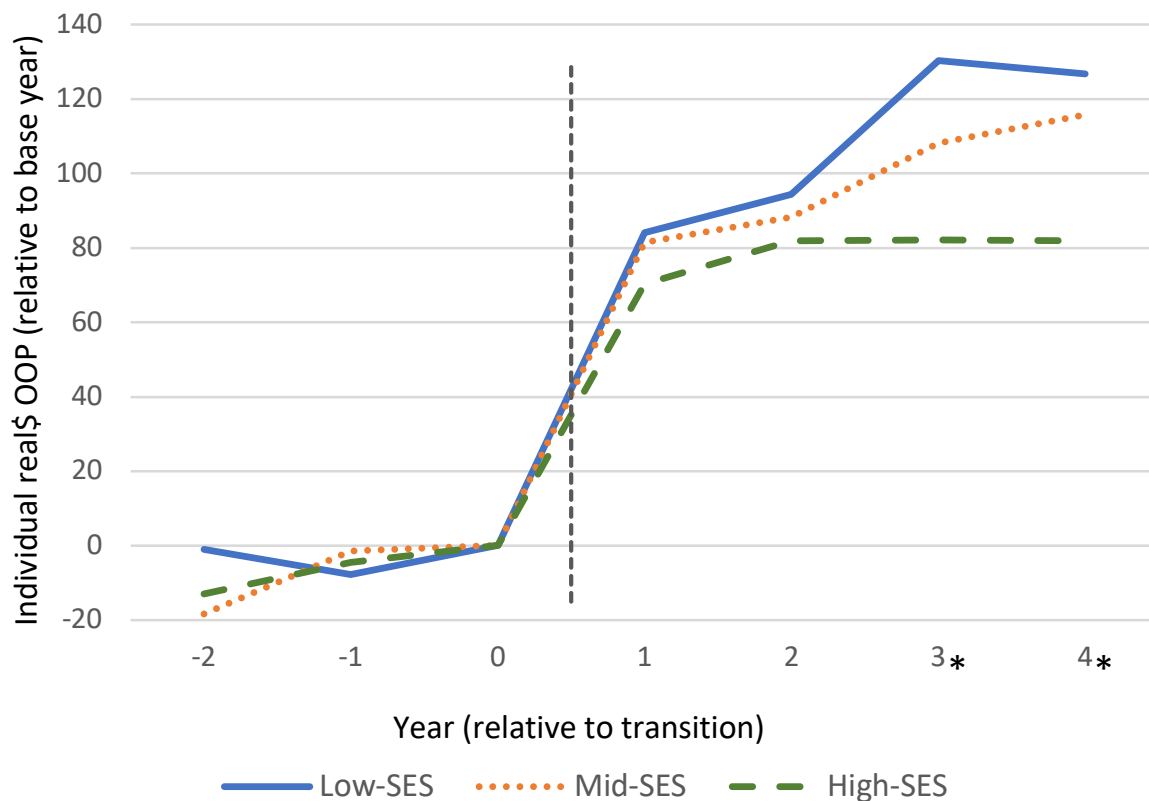
Figure 5: Estimated effects of choice devolution on mean annual OOP medical expenditure burdens among the least healthy (top ACG score quartile). *Notes:* This figure shows pooled difference-in-difference estimates of changes in OOP medical expenditures among enrollees at firms that transition to devolved choice of deductible level, with the sample restricted to persons in the top 25 percent of the ACG health risk score distribution at the pre-devolution baseline. SES categories correspond to the bottom 25 percent, middle 50 percent, and top 25 percent of the sample distribution. The model is estimated with year-fixed effects and with person-fixed effects centered at the pre-devolution level. ∗ indicates a statistically significant difference between the high- and low-SES groups at $p < 0.01$.

Mechanisms and Behavioral Responses: Through What Intervening Processes Does Devolved Choice Stratify Expenditure Burdens?

The results above are generally consistent with the hypothesized process whereby devolution produces less efficient matching of persons and plans among lower-SES actors compared with higher-SES actors. A particular mechanism that might contribute to such patterns is if a subset of low-SES actors who are poorly suited to HDHP plans (e.g., because of chronic conditions, high care utilization, lack of financial cushion, etc.) are being lured into these high-risk plans by the lower monthly premium costs.

One implication is that the post-devolution growth in between-class disparity would be especially acute among the subpopulation that selects into the high-
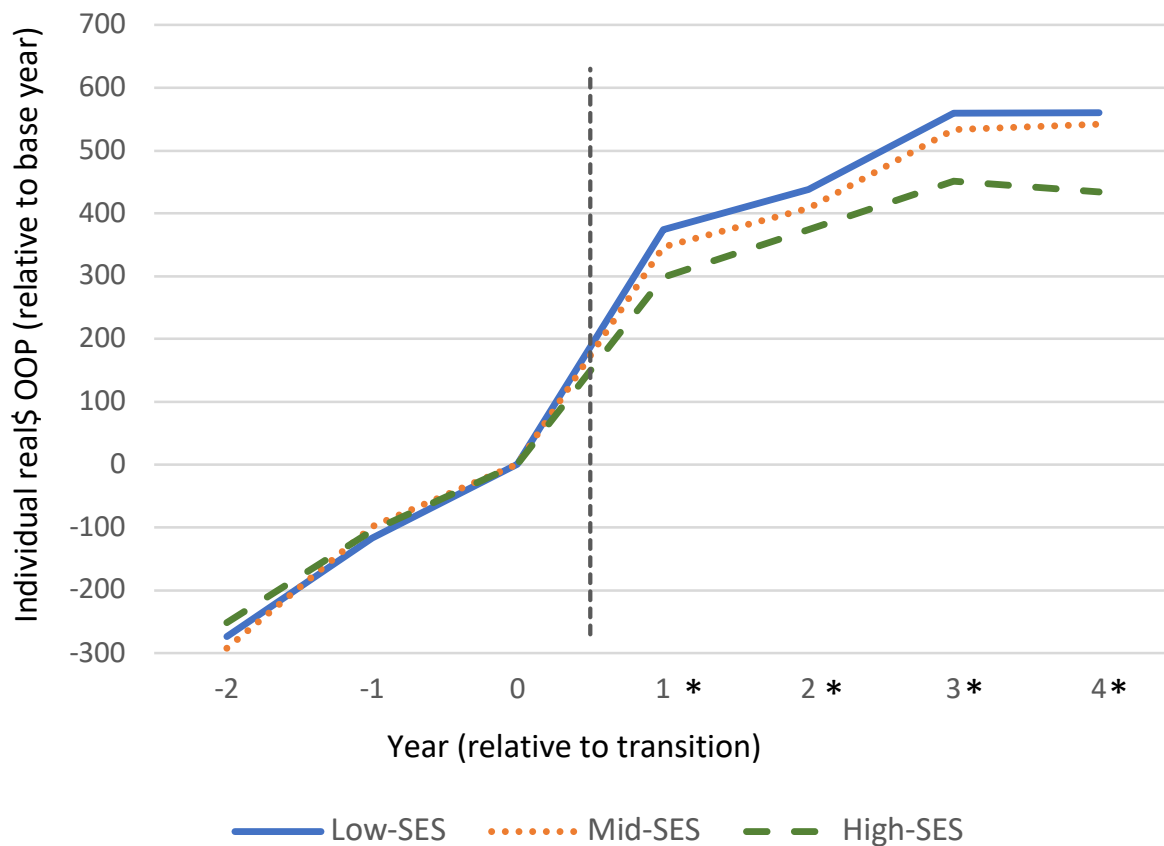
Figure 6: Conditional quantile regression estimates of effect of choice devolution among high-cost enrollees at the 95th percentile of the OOP distribution. *Notes:* This figure shows conditional fixed effects quantile regression estimates of differential changes in OOP medical expenditures at the 95th OOP percentile at firms that transition to devolved choice. SES categories correspond to the bottom 25 percent, middle 50 percent, and top 25 percent of the sample distribution. The model is estimated with year-fixed effects and with person-fixed effects centered at the pre-devolution level. ∗ indicates a statistically significant difference between the high- and low-SES groups at $p < 0.01$.

deductible plans. Figure **??** shows this result. Conditional on having to make a choice *and* opting into the high-risk plan, costs go up significantly more for low-SES enrollees than for higher-SES enrollees. This is consistent with a dynamic of systematically less optimal selection into high-risk plans among lower-SES employees: although higher-SES enrollees are more likely to choose HDHP plans relative to lower-SES enrollees (Bundorf 2016), those low-SES enrollees who select into the high-risk plan experience significantly greater increases in realized expenditure burden.

A second post-treatment factor is changes in actors' healthcare utilization. Exposure to greater cost-sharing leads HDHP enrollees to modestly reduce their healthcare usage, and lower-SES actors may be especially prone to forego care in the
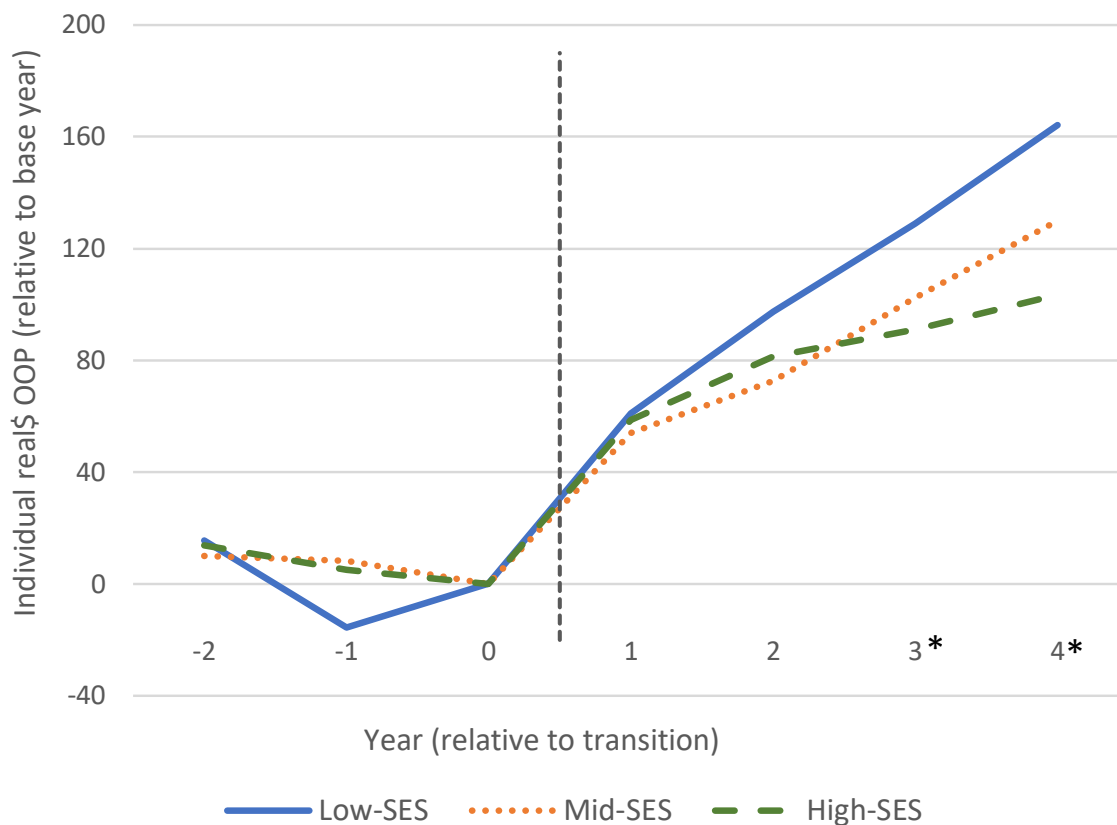
Figure 7: Estimated effects of choice devolution on mean annual OOP medical expenditure burdens among enrollees who select into high-deductible plans following choice devolution. *Notes:* This figure shows pooled difference-in-difference estimates of changes in OOP medical expenditures among enrollees at firms that transition to devolved choice of insurance deductible level, with the sample restricted to persons who select to enroll in an HDHP following the transition to choice. SES categories correspond to the bottom 25 percent, middle 50 percent, and top 25 percent of the sample distribution. The model is estimated with year-fixed effects and with person-fixed effects centered at the pre-devolution level. ∗ indicates a statistically significant difference between the high- and low-SES groups at $p < 0.01$.

face of potential OOP burdens (Wharam et al. 2013). Thus, one potential reason for the surprisingly small magnitude of the effects of devolution on between-SES OOP growth observed above is compensating reductions in overall healthcare utilization. Self-rationing among low-SES actors might blunt what would otherwise be larger socioeconomic differences in expenditures.

To examine this possibility, we added a time-varying control for overall utilization (as measured by standardized cost for services received) and then calculated the predicted changes in OOP burden under the counterfactual scenario where each member's utilization was held constant at the baseline level. These results (not reported) show that controlling for healthcare utilization has very little effect on the estimated difference-in-difference. Between-class gaps remain almost exactly the

same for both the primary OOP outcome and the premium-adjusted OOP outcome. This constancy likely reflects the fact that the HDHP enrollment typically has only small effects on relative change in total spending (between three and seven percent).

Distinguishing the Effects of Devolved Choice from Mandated Risk-Bearing

All of the analyses presented thus far assess the effects of choice by comparing individuals' OOP burdens against their pre-choice levels within the firms that transition from all-low deductible to choice of deductible. As a final analysis, we compare the distributional effects of transitions to choice against the counterfactual treatment condition in which employers move all of their employees to high-deductible plans in a mandated fashion. Full-replacement transitions to high-deductible plans shunt greater risk on employees, but they do so in a uniform manner. Comparing the distributional effects of these two alternative policies allows us to gauge the extent to which individuated selection per se contributes to social inequality in the burden of OOP costs, over and above the effects of employer-mandated increases in cost-sharing.

To compare these two conditions, we extend the event study model above by including a three-way interaction term between type of transition (choice vs. full replacement), SES, and time relative to the transition. This can be thought of as analogous to a triple difference-in-difference model insofar as the estimated quantity of interest is the difference across alternative treatments in the difference between SES groups in the within-person difference in OOP burden before and after the treatment.

One potential concern with comparing outcomes between choice and all-HDHP firms is endogenous selection: firms that switch to choice may differ from those that switch to all-HDHP on dimensions that are related to employees' utilization trajectories and resulting OOP burdens. For instance, one study found that employees' average health status (as measured by baseline risk scores) was 10 percent worse at firms that transitioned to all-HDHP than at firms that transitioned to choice during the 2006-to-2007 period (authors' calculations from Lo Sasso, Helmchen, and Kaestner 2010:Table 2).

We address the selection issue using inverse probability weighting. Among all firms that ever make either transition, we estimated a cross-sectional probit model in which we regressed the type of transition (choice vs. full replacement) on the firm's size (number of covered employees), mean ACG risk score of employees, mean age of employees, and mean SES level of employees during the first year the firm appears in the data. We then use the inverse of the predicted probability from the probit model as a weight in the triple difference-in-difference event study model.

The results of this analysis are shown in Figure **??**. The left panel shows estimates for the full-replacement HDHP group, and the right panel is equivalent to that shown in Figure **??**, except for the inverse propensity weighting. Several patterns stand out. First, OOP burdens increase by a far greater amount in absolute terms within the full-replacement employers compared with choice employers
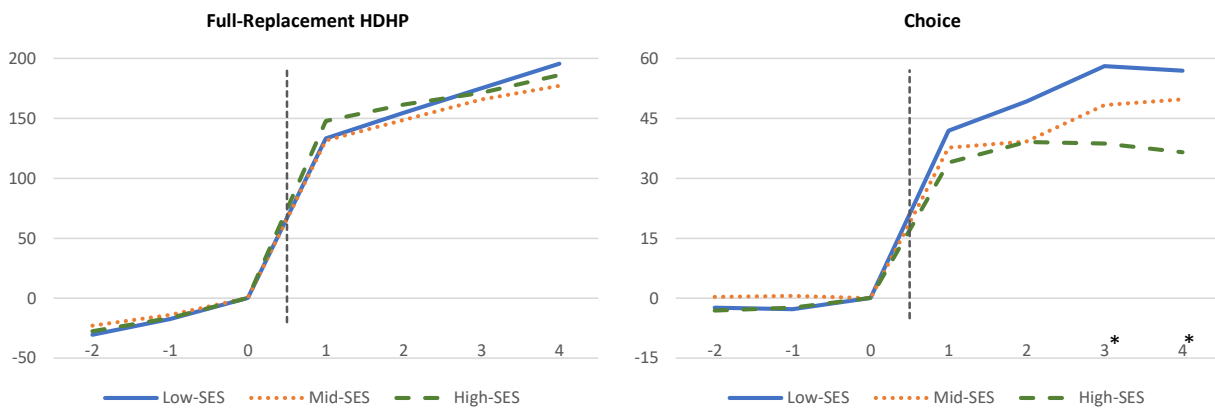
Figure 8: Triple-difference estimates comparing effects of choice devolution and full-replacement transition to high-deductible plans on differential changes in OOP burden by SES, with inverse probability weighting adjustment. *Notes:* This figure shows estimates from triple difference models of the effects of alternative transitions on OOP expenditures. The sample includes enrollees at all firms that *either* undergo a mandated transition to all high-deductible plans *or* transition to devolved choice of insurance deductible level at some time during the study period. SES categories correspond to the bottom 25 percent, middle 50 percent, and top 25 percent of the sample distribution. The model is estimated with year-fixed effects and with person-fixed effects centered at the pre-devolution level. Because firms' decisions to elect full replacement versus choice may depend in part on the health risk profiles of their employees, we applied inverse probability weighting using weights derived from a firm-level probit model of transition type on demographic and health risk characteristics of their enrollee pool. ∗ indicates a statistically significant difference between the high- and low-SES groups at $p < 0.01$.

(note the differing y axis scales in the two panels). This is not surprising. More important, however, are the differential changes in the relative disparities between SES categories across the two panels. As shown in the left panel, OOP burden increases by a comparable amount across SES categories in the aftermath of full replacement. By the fourth post-transition year, the relative OOP growth from baseline among low-SES enrollees is only five percent greater than the relative growth among high-SES enrollees. In contrast, there is a significantly greater socioeconomic dispersion in the aftermath of employer transitions to plan choice (right panel). The pattern of growing disparity here is similar to that seen in Figure **??** above. By the fourth post-transition year, low-SES members' OOP burden has increased 56 percent more than high-SES enrollees on average, relative to each group's respective baseline.

Overall, the triple-difference results in Figure **??** suggest a nuanced conclusion: full-replacement transitions to high-deductible plans result in greater average increases in expenditure burden for everyone compared with choice transitions, but their redistributive effect across the SES spectrum is smaller in relative terms compared with choice transitions. In other words, the mandated privatization of risk via full-replacement conversion to high-deductible plans shifts risks and costs *from* employers to employees but has little effect on stratification of expenditure burdens *among* employees.

Discussion and Conclusion

Efforts to rationalize the allocation of benefits and risks through devolved choice are emblematic of a broader trend toward individuation in American social institutions. This shift has been especially pronounced in healthcare, where activated beneficiary-patient-consumers are increasingly required to take on the roles of calculating actuary and informed, cost-conscious shopper for medical services (Gruber 2017; Young and Chen 2020). Even as a growing number of studies cast doubt on the capacities of consumers to act in accordance with the behavioral logics that these policies presume (Loewenstein et at. 2013; Bhargava, Loewenstein, and Sydnor 2015; Young and Chen 2020), there has been less research on the potentially stratifying effects of consumerism.

This study developed a theory of choice devolution as class-biased institutional change, which we tested by analyzing the effects of employer transitions to health insurance plan choice on between-strata inequality in realized OOP medical expenditure burdens among employees. The results of event study models show modestly greater increases in OOP expenditure burdens for low-SES enrollees relative to high-SES enrollees following transitions to devolved choice of employee insurance plans. This suggests that devolution of risk management (plan choice) to employees heightens social stratification of medical expenditure burdens. However, the average between-group difference-in-difference in expenditure burdens is economically very small: approximately $30 per year on average, or approximately $100 per year at the 95th percentile of the OOP distribution based on a conditional quantile regression model. These disparities in the financial effects of devolution are not driven by socioeconomic differences in health risks, as indicated by the fact that the estimated difference-in-differences remain substantively identical when conditioning on baseline ACG scores. To the extent that choice redistributes expenditure burdens among beneficiaries in a class-biased manner, it does so by activating latent differences in actors' capacities to adapt to a self-actuarial model, rather than through class disparities in underlying health risk.

To further disentangle the effects of devolution of choice from devolution of risk, we also compared the distributional effects of transitions to plan choice with transitions to all-high-deductible plans, using a triple difference-in-difference. In contrast to choice devolution, switching all employees to high-deductible plans results in a significantly larger average increase in OOP burden for all SES groups but less relative growth in the dispersion between SES groups. Together, the results suggest that devolving *the management of risks* onto individuals through consumer choice represents a distinct mechanism of class-biased institutional change in contemporary social insurance systems, albeit one whose effects on between-class dispersion is modest in magnitude.

Before discussing broader theoretical implications, it is important to note a few limitations and interpretive caveats, some of which may help account for the smaller than expected effects of devolution. First, although ESI offers a useful strategic site to study the linkage between devolved risk and socioeconomic inequality in the United States, a limitation of the ESI setting is that it effectively constrains our analysis to inequality *within* the upper two-thirds of the SES distribution (which is the

population primarily covered by ESI).[12] Analyzing the impact of choice devolution in an institutional context that included the full population SES distribution would presumably yield larger estimates of its stratifying effects.

Second, the use of coarse measures of socioeconomic class status—along with possible measurement error—will tend to attenuate estimates of devolution's overall effects on between-class OOP expenditure inequality. Specifically, we expect that downward attenuation bias in the reported choice ∗ class strata coefficient could be as high as 22 percent. This figure is based on validated reliability of the deductible offering indicator of 0.98, an informed assumption that the reliability of the SES indicator is at least 0.8, and near-zero correlation between SES strata and exposure to choice.[13] Because the reported difference-in-differences are small, recognizing that the true effect of devolution on increases in between-strata expenditure burden might be 22 percent greater does *not* substantively alter our interpretation that choice devolution has an economically modest effect on between-class stratification. Nonetheless, the results reported above should be seen as lower-bound estimates.[14]

Third, as noted above, differential changes in OOP expenditure burden do not fully capture the scope of class biases in the effects of individuated insurance plan choice on household finances. In addition to differential employee contributions to monthly premiums in low- and high-deductible plans (for which we adjust above), enrollees in high-deductible plans can also realize additional tax savings via contributions to tax-advantaged health savings accounts.[15] These tax savings accrue disproportionately to higher-income employees because of their higher marginal tax rates, their greater likelihood of choosing an HDHP, and their greater discretionary contributions to health savings accounts. The fact that the turn to consumer choice has been complemented by tax incentives means that the total upward distributive effects are certainly greater than an accounting of OOP burdens alone suggests.

Finally, there are historical scope conditions insofar as the present data cover a period preceding the implementation of the ACA legislation in 2014, which significantly structured the rules of the U.S. health insurance system. On the one hand, the ACA accelerated and entrenched the turn toward greater plan choice and consumer-driven healthcare systems. At the same time, it also placed maximum annual limits on families' OOP expenditures, thereby constraining the right tail of the OOP distribution. Future research should examine the net effects of these policy changes on the social stratification of medical expenditure burdens.

Theoretical Implications

Our study makes several broader contributions to sociological research on institutions, risk, and inequality. First, we advance research on the privatization of risk (Hacker 2006; Western et al. 2012) by distinguishing increased individual *exposure* to risk and increased devolution of responsibility for *managing* risk. These can be seen as analytically distinct mechanisms. Our analyses comparing choice devolution with across-the-board transitions to high deductibles suggest that the devolution of *choice* has distinctive effects on social stratification.

Second, the study contributes to the literature on organizational inequality by identifying a set of indirect mechanisms by which organizational practices shape

stratification among their members (Tomaskovic-Devey and Avent-Holt 2019). Even as firms have responded to shareholder value pressures and the increasing costs of employee benefits by shunting a greater share of costs and risks onto their workers (Cobb 2015; Kristal, Cohen, and Navot 2020), these shifts can also have the inadvertent effect of heightening inequality *among* employees.

Third, the analysis contributes to a growing literature on administrative burdens as a stratification mechanism (e.g., Bertrand, Mullainathan, and Shafir 2004; Herd and Moynihan 2019). There is growing interest in understanding how the learning and hassle costs required to navigate complex social policy designs may exacerbate inequality by amplifying the effects of actors' preexisting resource disparities. This article represents one of the few attempts to isolate the class-differentiated effects of increased choice burden on economic outcomes.

Fourth, the article advances often abstract debates about "institutionalized individualism" (Beck and Beck-Gernsheim 2002) by locating this trend in concrete institutional changes. Whereas the present study examined the short-term effects of choice devolution on expenditure burdens, future research might study the longer-term effects on other outcomes and behaviors. For instance, has the widespread diffusion of insurance choice compelled Americans to absorb and perform more calculative economistic logics of actuarial decision-making in the same way that the pension privatization has spurred them to adopt the frames and calculative practices of financial investors (Langley 2008; Fligstein and Goldstein 2015)?

Finally, the conceptual framework laid out above opens future pathways for explaining broader patterns of changing inequality. One of the most significant but poorly understood aspects of contemporary stratification regimes is the pervasive growth of within-group (e.g., gender, race, education, occupation) inequalities alongside parallel but typically less pronounced growth in between-group disparities (e.g., Kim and Sakamoto 2008; Mishel et al. 2012; Breen and Chung 2015:Table 4; Ghilarducci, Radpour, and Webb 2020). Previous theoretical work often treats these as empirical manifestations of competing explanatory mechanisms, whereby within-group inequality is seen to be indicative of individualized risks and positions displacing the explanatory relevance of traditional class categories (e.g., Pakulski and Waters 1996; Beck and Beck-Gernsheim 2002). In contrast, the framework developed here raises the prospect that individuation processes might simultaneously fuel both within- and between-group disparities. The idea is that less standardized allocational systems open greater room for idiosyncratic variation, resulting in greater within-group variance in outcomes. At the same time, they also increase between-group inequality by amplifying the effects of existing inter-group disparities in resources as actors are forced to navigate high-uncertainty environments on their own. Although the current study focuses on the latter mechanism, future studies might extend this approach by decomposing the effects of individuating institutional changes on between- and within-group inequality explicitly (Ghilarducci et al. 2020). Such questions deserve greater attention from sociologists as the privatization of public provision makes individual risks and choices more and more determinative of life chances in the twenty-first century.

Table A: Validation analysis of employer plan offering deductible type imputation

| | Firm size strata (validation subsample) | | |
	100–400 enrollees	401–701 enrollees	701–1,000 enrollees
N validation test sample	3,810,668	208,878	29,614
N correctly imputed	3,747,711	206,376	29,614
Reliability factor	0.983	0.988	1.000

Appendix

This section provides additional details on validation of the employer deductible type imputation procedure, as described in Wharam et al. (2019).

The imputed deductible types for midsized and large employer groups were validated by leveraging the availability of gold-standard administrative benefit details for a subset of midsized employers in the claims data. Although direct benefit information was primarily available for small-group (fewer than 100 enrollees) firms, it was also reported for a significant portion of midsized employers (more than 100, fewer than 1,000 enrollees), covering approximately 8.1 million person-year observations. One half of this midsized sample was used to refine, and another half was used to validate the deductible type imputation procedure. Table **??** shows the results of this test, broken out by firm-size strata.

The validation shows very high reliability overall, with 98.4 percent correctly assigned in the validation sample. Reliability is slightly greater for larger employee groups. This is not surprising because a larger group of enrollees will furnish clearer clusters of annual deductible charges. Although it impossible to assess the out-of-sample reliability of the imputation for large employers with more than 1,000 enrollees, the fact that reliability increases across the size distribution of midsized employers offers reassurance that the imputation is likely to perform well for large employers as well.

Notes

1 Here and throughout the article we define high-deductible plans as greater than or equal to $1,000. This matches the IRS's eligibility threshold for tax-advantaged health savings accounts in the Medicare Modernization Act of 2003, which was just after our study start date in 2002. Prior to this point the IRS used higher deductible eligibility thresholds for the less common and subsequently discontinued Archer Medical Savings Accounts plans.

2 Aggregate coverage figures come from Kaiser Family Foundation analysis of the National Health Interview Study. Quantile statistic is based on calculation from the March supplement of the Current Population Survey.

3 Only 11.8 percent of non-elderly persons in households below 100 percent of the federal poverty level had employer insurance in 2012 (Rae et al. 2020).

4 The expansion of choice (between low- and high-deductible plans) was slightly more pronounced in the commercial claims data than in the Kaiser Family Foundation/HRET Employer Health Benefits Survey, although the trends are similar. This discrepancy likely

results from the fact that the Kaiser survey includes a significant share of public sector governmental employers, whereas the commercial claims data do not.

5 The growth of consumer choice in ESI occurred alongside parallel marketization in public insurance. The state-operated exchanges created by the ACA are built explicitly on a consumerist architecture (Mulligan 2017). Consumer choice markets have also been incorporated into government insurance programs through Medicare Part D and Medicaid Managed Care (e.g., Coughlin et al. 2008; Gruber 2017). Since 2010, the number of enrollees in *private* Medicare plans has exceeded the number in public plans (Gruber 2017).

6 Selecting insurance plans is not *easy* even for experts. Sanger-Katz (2020) quotes several prominent health economists reflecting on the challenges they faced in attempting to understand their own workplace plans.

7 Data use agreements prevent us from identifying the insurer by name. It is among the largest commercial insurers in the United States.

8 One further caveat is that because our data cover only one insurer, the analysis of choice is confined to cases where employers offer choice of plans *within* a single carrier, rather than choice of plans across multiple carriers. This is not a significant concern, given that very few employers offered multicarrier plans during the 2000s because of insurers' efforts to discourage firms from "slicing" the employee pool across multiple carriers (Enthoven and Fuchs 2006) and firms' desire to reduce administrative expense (Maxwell, Temin, and Watts 2001).

9 There is a tradeoff between error and missingness due to the fact that the vendor-reported measures depend on additional individual-level administrative linkages to credit reports and public records, which are not available for some records. Use of vendor-supplied measure decreases the effective sample size by 29 percent.

10 The inclusion of year-fixed effects controls for the most plausible source of time-varying selection bias, which is if employers with greater shares of lower-SES employees tended to transition to choice at later times during the study period, when OOP levels were higher overall.

11 This also subsumes the assumption that post-treatment attrition is unconfounded with SES.

12 The hybrid public-private structure of health insurance in the United States means that population-level distributions of medical expenditure burdens are necessarily beyond the scope of the article. This caveat is particularly noteworthy given the shrinking share of low-SES households that were covered by ESI at all during this period. The share of the non-elderly population in households between 100 percent and 250 percent of the federal poverty level that were covered by ESI decreased from 55 percent in 1998 to 37 percent in 2013 (Rae et al. 2020).

13 The attenuation bias factor for the interaction term can be expressed as one minus the product of the reliabilities of each respective component, scaled by the covariance between them: $attenuation = 1 - rel(xz) = 1 - ((relx * relz) + cov(xz))/(1 + cov(xz))$.

14 Measurement errors can *upwardly* bias estimates of moderation effects under some circumstances when the errors are heteroskedastic. For instance, mismeasurement of income may be larger at the ends of the income distribution than at the middle. However, this is less likely in the present case because the SES strata indicators are based on wide ordinal buckets rather than continuous values.

15 Health savings accounts are structured like tax-advantaged individual retirement accounts, but funds are earmarked for healthcare expenses.

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