Can an unconditional cash transfer decrease poverty without decreasing labor supply for SSI and SSDI recipients? Evidence from the Alaska Permanent Fund Dividend, 1988-2019

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ABSTRACT: The United States' two chief disability programs, Social Security Disability Insurance (SSDI) and Supplemental Security Income (SSI), have been subject to two widespread sets of policy concerns: the potential effect of these programs in suppressing recipients' labor supply and the insufficiency of these programs in providing economic stability and dignity. The Alaska Permanent Fund Dividend (PFD) – an unconditional cash transfer program paid to all Alaska residents – may provide a model for increasing economic security for working aged (18 to 62 year old) SSI and SSDI recipients without imposing distortionary labor supply effects. By leveraging the stochastic fluctuations in the size of the PFD, this paper utilizes a plausible source of exogenous variation in the PFD transfer income to estimate the effect of this unconditional cash transfer on employment among adult SSI and SSDI recipients. This paper estimates the effect of this program through the construction of a synthetic control variable and the application of a difference-in-difference estimator to the American Community Survey (ACS). After establishing that the Alaska PFD has a small and statistically insignificant effect on employment, this paper asks what effect this program may have on poverty if it were implemented nationwide. Via a microsimulation approach, this paper estimates that if a transfer comparable to the Alaska PFD had been scaled nationally for adult SSI and SSDI recipients poverty rates would have been reduced by as much as 10 percentage points and would have offset the entirety of the rise in poverty among adult SSI and SSDI recipients since 2000.

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1 Introduction

Policy makers and researchers have raised two broad sets of concerns related to Social Security Disability Insurance (SSDI) and Supplemental Security Income (SSI). First, the structure of these cash transfers programs – e.g. high implicit marginal taxes and benefits cliffs – impose penalties on recipients who garner earned income such that they disincentivize labor supply (e.g. Autor and Duggan 2003; Deshpande 2016; Gelber et al. 2017). Secondly, the benefits provided by these programs have been deemed insufficient to provide a dignified standard of living (Burkhauser and Daly 2012; Hoynes and Rothstein 2019). A key piece of evidence for this second concern is the rising rate of poverty among adult SSI and SSDI recipients nationally (ACS). The experience of SSI and SSDI recipients in the state of Alaska provides unparalleled insight into the ability to address these two concerns through an unconditional cash transfer.

This paper test two hypotheses:

1. *Hypothesis 1:* Controlling for all relevant macroeconomic phenomena, an increase in the annual size of the Alaska PFD (within the range of annual fluctuations over the 2001 to 2018 period) does not lead to a decrease in the rate of employment among working-aged SSI and SSDI recipients.

2. *Hypothesis 2:* Had the Alaska PFD been a national and universal supplemental income transfer program over the 2001 to 2018 period, poverty rates among working-aged SSI and SSDI recipients would have been sizably less than the rates observed.

In service of hypothesis 1, the experience of Alaska provides incomparable insight into the employment effects of supplementing the incomes of SSI and SSDI recipients with an unconditional cash transfer. The stochastic and frequently large changes in the real dollar value of the PFD from year to year provides an ideal source of variation to estimate the employment effects of providing SSI and SSDI recipients with an unconditional cash transfer. Since the creation of the Alaska Permanent Fund Dividend (PFD) in 1982, all Alaska residents have been provided with an annual cash transfer payment that is unconditional on employment, income, and transfer program recipiency. Between 2001 and 2018, the size of the Alaska PFD has ranged from $1000 to greater than $2000 in terms of 2019 USD; this annual transfer has been given to all Alaska residents, including children and SSI/SSDI recipients.

Given that changes in the dollar value of this unconditional transfer payment does not increase the effective marginal taxes faced by SSI and SSDI recipients and may actually decrease the effective tax rate on employment participation, the PFD holds the promise of providing supplemental income without distortionary employment effects.[1] Additionally, variation in the size of the Alaska PFD does not correlate with other economic phenomena related to employment;

[1] The PFD is unique relative to other state and local cash transfer programs which may apply to SSI recipients. While the SSA counts PFD as unearned income, the Alaska government repays the SSA any and all overpayment due to the PFD. Consequently, the PFD imposes no effective tax on SSI and SSDI beneficiaries.

the size of the Alaska PFD is based on the five-year average performance of state oil revenues, meaning that its size is orthogonal to booms and bust in the oil economy and, thus, broader macroeconomic movements,

Despite the fact that the grant size of the PFD is constructed in such a way that it is quite clearly orthogonal to economic forces related to fluctuations in employment, concerns may be raised that the annual size of the PFD is not fully orthogonal to macroeconomic fluctuations relevant to employment. To answer this concern, I leverage the American Community Survey (ACS) to construct a synthetic control variable that allows for the estimation of a difference-in-difference estimator that is capable of fully isolating the employment effects of the Alaska PFD. Otherwise stated, through the stochastic variation in the real dollar value of the PFD and through differencing out fluctuations in employment in the same year among similar populations to Alaska SSI and SSDI recipients, this paper is able to estimate the effect of this transfer on employment among adult SSI/SSDI recipients.

After establishing the employment effects of this program (which are estimated to be near zero and statistically insignificant), I apply a microsimulation model to the ACS in order to counterfactually estimate the effect a national version of this program would have had on poverty rates among adult SSI/SSDI. This second component of the paper test hypothesis 2 which was outlined above. The estimates provided suggest that this non-employment distortionary income supplement may have substantially reduced poverty among SSI and SSDI recipients from 2001 to 2018 – e.g., poverty rates may have been reduced among adult SSI/SSDI recipients by between roughly 4 and 10 percentage points

2 Policy Context and Background

2.1 Labor market effects of the PFD for SSDI and SSI recipients

Many economists have come to characterize SSI and SSDI as two of the leading income maintenance programs in the United States. Since 2001, SSI and SSDI recipients of working age (18-64) have increased from 8.7 million to nearly 13 million in 2018 (SSA). Over this period, the number of adult SSI/SSDI recipients has increased from less than 5 percent to over 6 percent of the total adult population (*see* Figure 1). Furthermore, Mueller, Rothstein, and von Wachterraise (2016) argue "that the share of the working-age population receiving SSDI has more than doubled since 1990. . . [prompting] concerns about SSDI's fiscal sustainability." A chief concern surrounding the increasing numbers of Americans collecting SSI and SSDI who are of working age is the potential effect the structure of these programs may have on the labor market earnings of recipients and economic security among these recipients as well as gross economic output. Maestas et al.'s (2013) show that as the "caseload has grown, the employment of disabled workers has steadily declined. . . This occurred despite the facts that the Americans with Disabilities Act (ADA) created new employment protections for disabled workers, jobs became less physically demanding."

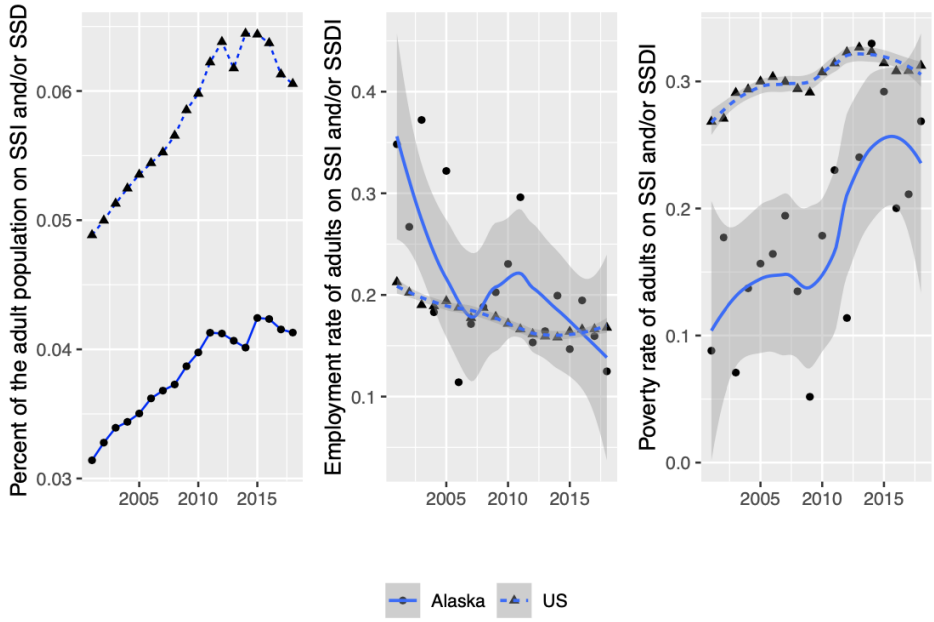

Figure 1: SSI and SSDI adult recipients as percent of the adult population and employment rate

Since the 1970s, the employment rate of people with disabilities have dropped as expenditures on SSI and SSDI have risen. SSDI spending has increased by over five-fold since 1970 and spending on SSI has increased by over a factor of three (Amorim 2019). Amorim (2019) writes, "Research has found that these increases in expenditures are driven by a growing fraction of people with disabilities out of the labor force. From 1980 to 2010, the percent of the population with work-related disabilities has remained virtually constant at about 8 percent, but the fraction of this population that is employed has decreased (from 35 percent to 22 percent) and the fraction that receives SSI or SSDI benefits has increased (from 33 percent to 51 percent)."

Chief amongst the factors that depress the labor supply of SSDI and SSI are the weighty effective tax rates on earned income that these programs impose. For SSI recipients, each dollar received as earned income reduces SSI benefits by 50 cents. For SSDI recipients, earning income over a relatively low threshold ($1,260 for non-blind SSDI recipients in 2019) in a month leads to the loss of all SSDI benefits for that month and threatens the ability to continue to receive benefits.

2.2 Alaska Permanent Fund Dividend

In 1980 the state of Alaska enacted the PFD program to distribute a portion of its oil revenues to state residents (Feinberg and Kuehn 2018). Since 1982, a share of the state's oil revenues has been distributed annually to all non-institutionalized Alaska residents as an unconditional cash transfer. The size of this dividend, though, has varied dramatically. From 2001 to 2018 the PFD allocations have varied between less than $1000 and to greater than $2000 (*see* Figure

2). Over this period, the median nominal size of PFD payments was $1,107, the mean payment was $1,272, and the mode payment was $1,600.

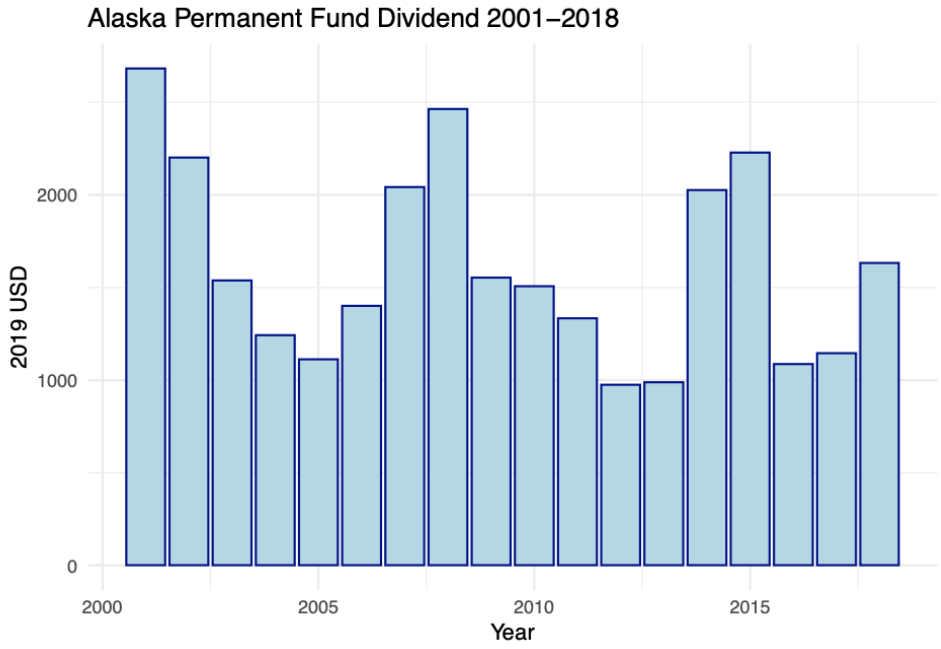

Figure 2: Alaska Permanent Fund Dividend 2001-2018

Year-to-year changes in the nominal size of the PFD have frequently been quite dramatic due to stochastic changes in the price of oil, the Permanent Fund's investment portfolio, and political consideration (e.g. the governor of Alaska has veto power of the dividend's nominal value). Figure 3 plots the distribution of year-on-year percent changes in the PFD from 2000 to 2018. Year-on-year changes over this period have varied between negative 61 percent and positive 100 percent. As Figure 2 makes clear, large changes in the size of the dividend are quite frequent – providing ample random variation to estimate the effect of this unconditional cash transfer on employment.

The Alaska Permanent Fund Dividend was worth nearly $61 billion as of August, 2017.[2] This fund is a sovereign wealth fund generated from Alaska oil royalties. Since 1982, nearly all Alaskan residents of all ages are eligible to receive dividend payments. Eligibility is established after residing in Alaska for one year. The Alaska Constitution outlines the requirement for the PFD.[3]

Each year, the dividend is calculated using a formula set in state law. The exact size of the PFD

[2] https://apfc.org/

[3] "At least twenty-five percent of all mineral lease rentals, royalties, royalty sale proceeds, federal mineral revenue sharing payments and bonuses received by the State shall be placed in a permanent fund, the principal of which shall be used only for those income-producing investments specifically designated by law as eligible for permanent fund investments. All income from the permanent fund shall be deposited in the general fund unless otherwise provided by law."(Amendment to Alaska Constitution, Article IX, Section 15)

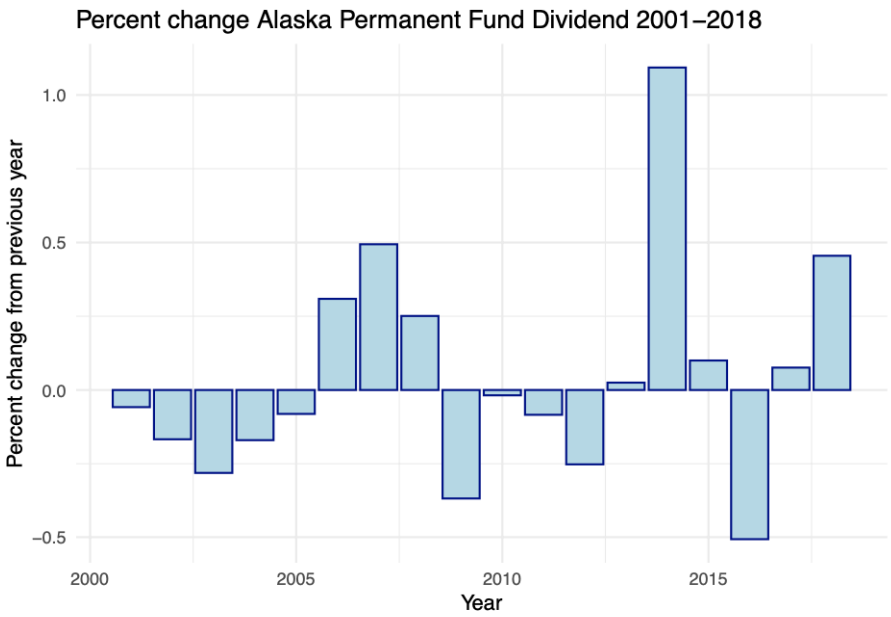

Figure 3: Percent change Alaska Permanent Fund Dividend 2001-2018

is the product of a board appointed by the governor of Alaska.[4] The payment is essentially universal with few exceptions, such as those with felony convictions. Dividend payments are provided to all Alaskan adults and children, typically around October. The formula is based on an average of the Permanent Fund income over five years.[5] It is calculated using 5 year returns in order to produce a relatively stable dividend size.[6] Roughly, the PFD is 10 percent of the mean returns from the previous 5 years divided by current eligible PFD recipients. The nominal value of the dividend has varied between $331 in 1984 and peaked at $2,072.8 in 2015. In order to qualify for a payment, a resident must have lived in Alaska for at least 12 months.[7] The way in which the PFD is calculated means that the size of the dividend is orthogonal to the business cycle (i.e. it is neither pro nor counter-cyclical).

While it is undoubtedly the case that the price of oil covaries with macroeconomic trends and, therefore, the price of oil is not completely orthogonal to labor market decisions and labor market earnings, it is not the case that the PFD covaries with macroeconomic economic conditions. Rather, by calculating the PFD as the average returns of the last 5 years, the PFD is quite definitionally orthogonal to macroeconomic conditions. The size of the PFD is more orthogonal

[4] https://web.archive.org/web/20160118182159/http://www.apfc.org/home/Content/aboutAPFC/board.cfm

[5] The formula is the following: "1) Add Fund Statutory Net Income from the current plus the previous four fiscal years. 2) Multiply by 21 percent. 3) Divide by 2. 4) Subtract prior year obligations, expenses and PFD program operations. 5) Divide by the number of eligible applicants. Once the dividend amount has been calculated, the next step is to determine if enough income is available in the earnings reserve account to pay the dividend. While the full amount of the earnings reserve account is available for appropriation, the principal is not. It is possible that, in a given year, the calculation may produce a dividend although the funds may not be available to pay it."

[6] https://web.archive.org/web/20130117184423/http://www.apfc.org/home/Content/dividend/dividend.cfm

[7] https://pfd.alaska.gov/Eligibility/Requirements

to macroeconomic conditions than typical US state government spending; given that US states' budgets, which are subject to prohibitions on debt financing, have highly pro-cyclical revenue collections, and have spending patterns that are often pro-cyclical.[8]

2.3 Interaction between PFD and SSDI/SSI

For both SSDI and SSI, recipients of the PFD do not see their SSI or SSDI benefits reduced. As part of a formal arrangement with the SSA, the PFD does not count towards the SGA for SSDI recipients and does not count as income (neither earned nor unearned) for SSI recipients. While the SSA would typically reduce benefit income dollar-for-dollar by the amount of some cash transfer payment in, at least, the month in which the payment would be received, this does not hold true for the Alaska PFD. This is because "Under an agreement between SSA and the state of Alaska, the state will repay an individual's overpayment resulting from the receipt or retention of the PFD payment for a period of up to four months" (SSA).

2.4 Labor market outcomes and labor supply effects of cash transfers, SSDI, and SSI

The experience of SSI/SSDI recipients in the state of Alaska provides a rare opportunity to study employment effects of an unconditional cash transfer on SSI and SSDI recipients. Studies concerned with the labor supply effects of cash transfer programs are typically not able to clearly elucidate how an increase in SSI or SSDI benefits would affect the labor supply and labor market behavior of SSI and SSDI recipients because such cash transfer benefits interact with SSI and SSDI benefit formulae. Given that a change in the size of the PFD does not reduce SSI and SSDI income, the PFD is an effective increase in transfer income, albeit transfer income that does not impose an effective tax.

Both theory and empirical evidence suggest that programs with implicit taxes on earnings reduce labor supply. The 1970's Negative Income Tax experiments provide some of the most straightforward evidence for this (Robins 1985; Price and Song 2016). In terms of labor supply, these experiments show what has been confirmed elsewhere: substitution effects (i.e. the effect of marginal taxes) are greater than income effects (i.e. the effect of increasing income on labor supply).[9] In one of the most convincing studies on income effects as they relate to labor

[8] It should be noted, however, that from the 1980's until 2016, the Alaska PFD was determined by this formula with one exception in 2008. In response to the "high cost of energy", Governor Sarah Palin and the Alaska legislature passed a one-time special dividend payment atop ordinary dividend payments equal to $1,200 (2008 nominal USD) Additionally, in 2016, Governor Bill Walker vetoed the PFD as calculated by the formula discussed above on grounds that the formula would gradually reduce the size of the Alaska permanent fund and, therefore, threatened its fiscal sustainability. Therefore, for the years 2016 - 2018, the size of the PFD has been roughly half of what the dividend formula sets the PFD to be. In 2016, for instance, the PFD was $1,022, rather than $2,052, as the formula would call for.

[9] The meaning of these terms is covered in the neoclassical labor supply sections

supply, Imbens et al. (2001) uses lottery winnings to show that an exogenous 10 percent increase in income reduces earned income on average by about 1 percent – a change considerably less than estimated substitution effects.

Despite theoretical priors and empirical evidence on the income effects, the empirical evidence on the labor supply behavior of SSI and SSDI recipients with respect to changes in size of the cash transfer faces some ambiguities. Deshpande (2016) estimates the effects of SSI on labor supply and finds that SSI does decrease labor supply. Gelber et al. (2017) used administrative data on all new SSDI recipients between 2001 to 2007 to estimate that the "increase in DI payments of $1 causes an average decrease in beneficiaries' earnings of $0.20 and that annual employment rates decrease by 1.3 percentage points per $1,000 of DI payments." A 2017 representative survey of Alaskans suggests that it is generally ambiguous whether there are noteworthy income effects (Jones and Marinescu 2018). In 2017, a representative survey of Alaskans were asked how the PFD influences their work behavior; a majority (55 percent) reported no effect, 21 percent said it increased their labor supply, and 16 percent said it decreased their labor supply.

Lastly, given that the PFD is provided to all Alaskans, rather than just SSI and SSDI recipients, Alaska provides a unique opportunity to study the general equilibrium (GE) consequences of a universal unconditional cash transfer. In contrast to the bulk of research on the employment effects of SSI and SSDI, the Alaska PFD provides a context where the income transfer program of interest has general equilibrium (GE) effects. Typical neoclassical labor supply models (e.g. Mirrlees 1971) do not account for such GE effects. GE effects encompass the indirect impact of a policy due to the reaction of prices to the said policy. In this case, the PFD may 1) have a marginal negative effect on labor supply thereby pushing up the price of labor (i.e. increasing wages) and 2) it may increase aggregate demand. It is rare for quantitative work on cash transfers to be able to account for GE effects. Egger et al. (2019) working with the charity organization "Give Directly" was able to study the GE and labor supply effects of an unconditional cash transfer equal to roughly a fifth of the local economy in rural Kenya. Via these GE effects, there was no decrease in employment as a result of this unconditional cash transfer.

3 Data

This paper uses the ACS to conduct its analysis. The ACS is the largest nationally representative annual survey conducted by the Census. During years of the decennial census, the ACS data is a 1 percent random selection of the census. During non-decennial census years, the ACS is still quite large. This repeated cross-section annually surveyed between 0.5 and 2 million households between 2000 and 2018.[10]

[10] According to the Census Bureau the "ACS surveys approximately 250,000 households each month by mail, or 3 million households per year. The questionnaire contains 48 questions about each individual in the household and 21 questions on housing...The overall weighted response rate to the ACS is very high at 97-98 percent...[and] data are obtained for approximately 2 million households per year."

3.1 Identification of adult SSI and SSDI in ACS

Altman et al. (2017) evaluate the quality of the ACS in terms of its ability to identify SSI, SSDI, and disabled individuals. They conclude that the ACS can identify such populations in a representative manner that does not show evidence of systematic bias. While the ACS does pose an explicit question for whether a survey respondent collects SSI income, the ACS does not pose an explicit question for whether one collects SSDI income. However, the ACS does collect information on whether one collects social security income. Therefore, by subsetting the analytic sample to include only individuals of pre-retirement age (i.e. 18 to 62), it is highly reasonable to assume it is the case that all individuals reporting SSI and/or social security income are either recipients of SSI and/or SSDI.

3.2 Calculation of the poverty rate with the PFD

A key component of this paper is the identification of poverty among adult SSI/SSDI recipients. The ACS provides a measure of each respondent's poverty status by expressing their relevant family income as a percent of the poverty line. This variable (POVERTY) takes on values between 0 and 501, where 0 is code for N/A (therefore, these observations are excluded) and 501 is a top-code. As defined by the Census Bureau, a family's poverty status is a function of all income before taxes (including SSI and SSDI income), but not capital gains and non-cash government benefits (e.g. public housing, Medicaid, and food stamps).

The federal poverty line (FPL) increases with family size. The FPL is the same for all states in the contiguous United States, but is higher in Alaska and Hawaii. The threshold used have their origins in the early 1960s and have subsequently been adjusted for inflation. In 2019 the FPL for the contiguous U.S. was $12,409 for a family of one and $4,420 more for each additional family member. For Alaska the comparable figures were $15,600 and $5,530, respectively.

A robust literature exists that has debated and evaluated the quality of this measure (e.g., Nolan 2017). While the limitation to this measure and questions related to the robustness of the FPL have been quite clearly established elsewhere, it is not the purpose of this paper to argue for the quality of this measure. Rather, this paper accepts the FPL as a widely used, standard measure of poverty; therefore, the FPL can reasonably serve as a useful proxy of economic insecurity and material deprivation that can be widely compared across literatures and policy debates.

In order to establish the effect of scaling the Alaska PFD nationally, it is imperative to use the precise measure of family income used to establish poverty among survey respondents. The ACS does indeed include a measure of family income for each respondent. Therefore, this paper reconstructs the measure of family income used by the ACS by multiply the percent of the FPL by the FPL conditional on the state and family size (FAMSIZE in the ACS) of each survey respondent.[11] The addition of the real annual value of the PFD to this measure of family

[11] The correlation between the measure of poverty derived from the ACS and the measure constructed from this procedure are identical – i..e., these two poverty dummies provide the exact same estimate for the fraction of

income is later used to establish the post-transfer poverty rate of a hypothetical national level PFD program.

For the purposes of the synthetic control, the ACS poverty variable is used. However, there is a highly relevant question posed by Berman (2018) of whether the Alaska PFD is included in the family income used to establish poverty status. While the income definition used for the FPL would clearly include the Alaska PFD, the disbursement of this transfer occurs after ACS respondents are surveyed, raising doubts that many Alaska residents adequately report this transfer income. While over 90 percent of Alaska residents receive the PFD, less than 50 percent of Alaska ACS respondents reported any "other income" – the most reasonable category under which the Alaska PFD should be reported – and only 30 percent reported receiving any "unearned income" – another category the PFD could reasonably be reported under. Lastly, the income reported for these categories was almost always less than the value of the PFD for the respondent's family size.

To address this, Berman (2018) implements a fairly complicated imputation scheme. I take a different approach from Berman. Given a paucity of information available from the ACS to properly ascertain whether a respondent is reporting the PFD, I impute the following range of values to estimate the Alaska poverty rate for adult SSI/SSDI recipients:

1. At one extreme, I assume that no respondent reports the Alaska PFD. Under this approach, the PFD is added to each respondent's total family income, where the PFD is the annual transfer times each respondent's family size.

2. Secondly, I take a more moderate approach. I determine the PFD for each respondent based on their family size and I add half the value of the PFD to each respondent's total family income.

3. Lastly, I treat the measure of total family income derived from the ACS's poverty measure as accounting for the PFD. This last approach will certainly underestimate the contribution of the PFD to familial finances.

The results of these three approaches to the measure of Alaska poverty are provided in table 5.

4 Methods

A central risk to properly identifying the employment effects of variation in the size of the PFD would be if the variation in the size of the PFD were not orthogonal to macroeconomic factors that may be highly relevant to employment conditions (e.g., the price of oil and the business cycle). Fortunately, the design of the Alaska PFD makes it highly unlikely that there is a

the population in each year in poverty. This means that the family size I assigned is identical to the size used by the Census and that the measure of total family income constructed from the ACS's POVERTY variable corresponds precisely to the measure used by the Census.

systematic relationship between macroeconomic factors and the size of the PFD. First and foremost, the Alaska PFD is calculated as the average return over the last five years on the Alaska Permanent Fund divided by the eligible population. By averaging the returns, the threat to identification related to this point is largely eliminated. Given the PFD formula, macroeconomic cycles and the size of the PFD should not covary.

To further guard against threats to identification and, particularly, threats to the strict exogeneity assumption, I develop a synthetic control. This synthetic control closely mirrors a synthetic control developed by the economists Damon Jones and Ioana Marinescu for their 2019 paper on the Alaska PFD.[12] Jones and Marinescu (2018) use the Current Population Survey as a repeated cross-sections in order to conduct their analysis and construct their synthetic control. The methods used by Jones and Marinescu (2018) builds from Abadie, Diamond, and Hainmueller (2010; 2015) and Abadie and Gardeazabal (2003). In order to construct a synthetic control, a weighted average of control states most similar to Alaska in terms of a set of independent variables are used. This analysis was conducted in R and used Abadie, Diamond, and Hainmueller's synth package.

From this synthetic control, I am able to estimate a difference-in-difference model. A difference-in-difference model relies on a far less strict assumption that in the absence of treatment (i.e., the PFD) the unobserved differences between treatment and control groups would be the same over time (i.e., a strict exchangeability assumption). Rather, a difference-in-difference model allows such unobserved differences to be explicitly netted out.

In the absence of a clear control group as would arise in randomized control trials (RCT), I develop a synthetic control. This synthetic control is created to best match Alaska by minimizing the difference with Alaska along several metrics: 1) share of the overall working age population employed in the oil industry, in addition to the following metrics for the adult SSI/SSDI population: 2) their poverty rate, 3) share female, 4) share with a high school education as their highest degree, and 5) their employment rate. A unique synthetic control is created for each year. Constructing a unique annual synthetic control overcomes the bulk of the concerns that may violate the parallel trends assumption.

4.1 First-difference

I first estimate a first-difference model. This estimator does not include a synthetic control. Rather this model is an OLS model, where the dependent variable ω is the percentage point change in the employment rate of Alaska adult SSI/SSDI recipients and the independent variable is the change in the real value of the Alaska PFD.

$$\hat{\omega} = [(\bar{y}_{AK,t} - \bar{y}_{AK,t-1})]$$

[12] I am very grateful to Damon Jones and Ioana Marinescu for sharing their STATA code with me that constructs their synthetic code.

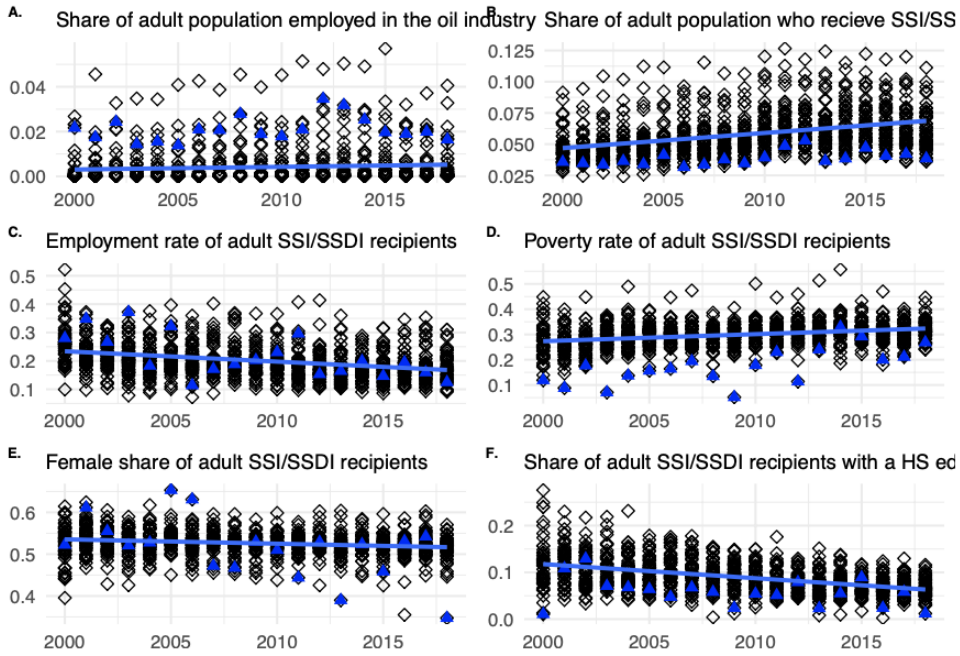

Figure 4: State variation in independent variables and dependent variables, 2000 to 2018

$$\hat{\omega} = \beta_0 + \beta_1 [\frac{PFD_t - PFD_{t-1}}{PFD_{t-1}}]$$

4.2 Difference-in-Difference with Synthetic control

Subsequently, I estimate the difference-in-difference model with the synthetic control. For this model, the dependent variable of interest, δ, is the percentage point year-on-year change in the employment rate of adult SSI/SSDI recipients minus the percentage point year-on-year change in the employment rate of adult SSI/SSDI recipients in the synthetic control. Subsequently, the year-on-year percent change in the real value of the Alaska PFD is regressed on $\hat{\delta}$ (see figure 5 for the distribution of difference-in-difference estimate by year).

The difference-in-differences model for the effect of the PFD on employment of adult SSI/SSDI recipients can be written as follows:

$$\hat{\delta} = [(\bar{y}_{AK,t} - \bar{y}_{AK,t-1}) - (\bar{y}_{Syn.Cont.,\,t} - \bar{y}_{Syn.Cont.,\,t-1})]$$

$$\hat{\delta}_1 = \beta_0 + \beta_1 [\frac{PFD_t - PFD_{t-1}}{PFD_{t-1}}]$$

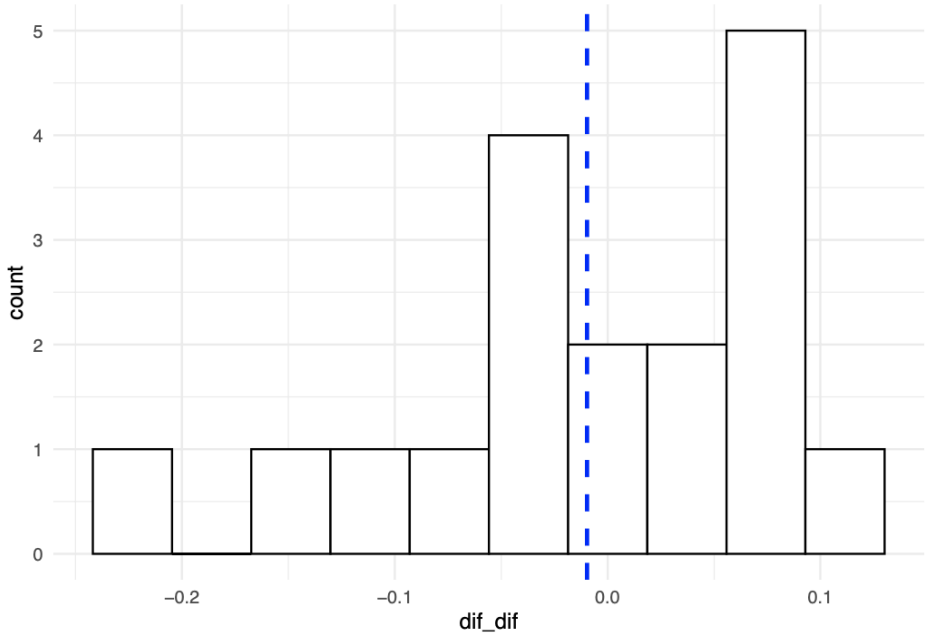

Figure 5: Distribution of difference-in-difference estimates by year

5 Results

In this section I walk through the result of the first-difference estimator and the difference-in-difference estimator. After establishing the estimated effect on employment to be near zero and statistically insignificant. I provide a simulation of the potential effect of scaling the Alaska PFD nationally on poverty among adult SSI/SSDI recipients.

5.1 First-difference estimates

Figure 6 graphs the independent and dependent variable from the first model. A line of best fit (i.e., OLS regression line) is also presented with a 95 percent confidence interval. As is clear, the relationship between an increase in the real value of the Alaska PFD (x-axis) and percent change in the employment rate of Alaska adult SSI/SSDI recipients (y-axis) is near zero.

Table 1 presents the estimated regression coefficient. The effect of a one-percent increase in the real value of the PFD on employment is negative 0.004. This effect is statistically insignificant. Additionally, the extremely small estimated R-squared and adjusted R-squared show that variation in the size of the PFD explains almost none of the variation in employment among adult SSI/SSDI recipients in Alaska from 2000 to 2018.

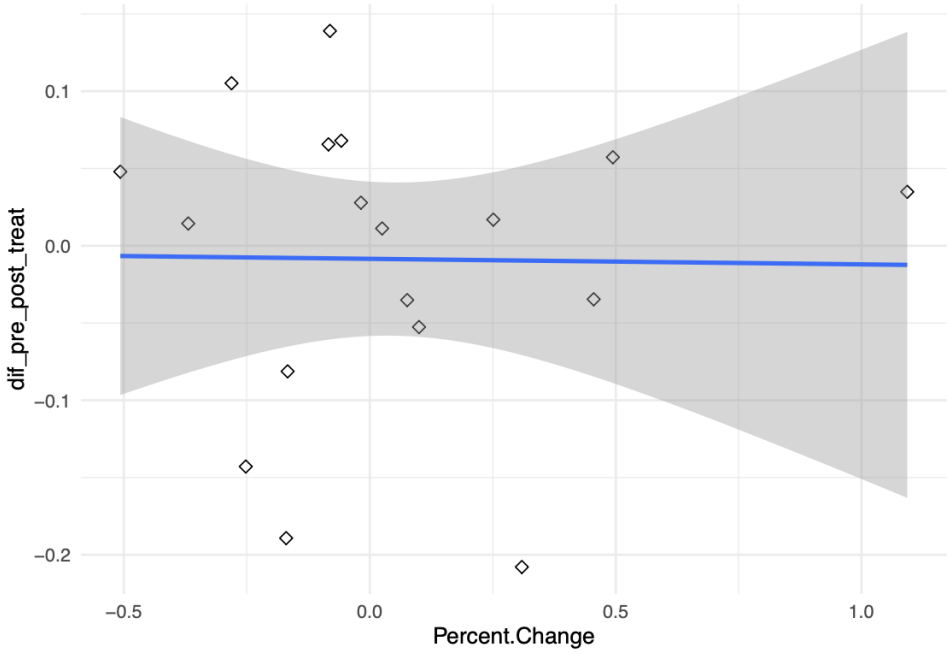

Figure 6: First-difference for Alaska against percent change in PFD

	Dependent variable:
	dif_pre_post_treat
Percent.Change	−0.004
	(0.064)
Constant	−0.008
	(0.024)
Observations	18
R^2	0.0002
Adjusted R^2	−0.062
Residual Std. Error	0.099 (df = 16)
F Statistic	0.003 (df = 1; 16)
Note:	*p<0.1; **p<0.05; ***p<0.01

Table 1: First-difference employment

5.2 Difference-in-difference estimates

Table 2 and figure 7 present the estimated results from the difference-in-difference model. The dependent variable in this model is the percentage point change in the Alaska employment rate for adult SSI/SSDI recipients from the previous year minus the analogous difference from the synthetic control. Like the first-difference estimates, the regression coefficient is slightly negative, but near zero, and the effect is statistically insignificant. Additionally, the estimated R-squared and adjusted R-squared strongly suggest that the variation in the real value of the PFD explains very little of the overall variation in the employment rate of SSI/SSDI recipients from 2000 to 2018.

	Dependent variable:
	dif_dif
Percent.Change	−0.028
	(0.059)
Constant	−0.008
	(0.022)
Observations	18
R^2	0.014
Adjusted R^2	−0.048
Residual Std. Error	0.091 (df = 16)
F Statistic	0.227 (df = 1; 16)
Note:	*p<0.1; **p<0.05; ***p<0.01

Table 2: Difference-in-difference - employment

Both the first-difference and the difference-in-difference models estimate a one percent increase in the size of the Alaska PFD has a near zero and a statistically insignificant effect on employment. Assuming that these results can be generalized to how employment dynamics would have played out had the PFD been a national program, it can be reasonably argued and hypothesized that scaling the Alaska PFD nationally would have negligible employment effect. Therefore, this program – both its structure as a universal program with no effective tax and its dollar value – holds the promise of raising net incomes of adult SSI/SSDI recipients without decreasing employment among this population.

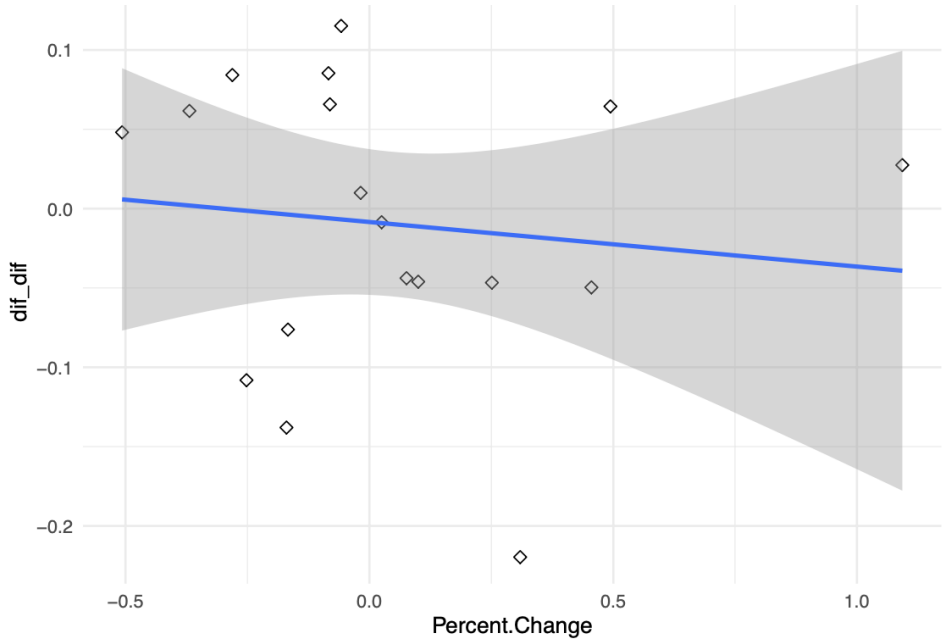

Figure 7: Difference-in-Difference: relationship between percent change in PFD and employment rate

5.3 Simulation of the Alaska PFD as a national program

Table 3 presents the results of a counterfactual historical simulation of the effects on poverty among adult SSI/SSDI recipients had a national level Alaska PFD policy been in place in every year from 2000 to 2018. The first three poverty rates are those for Alaska residents who are adult SSI/SSDI recipients. The first column presents the poverty rate as observed from the POVERTY variable provided by the ACS. The latter two columns provide the estimated poverty rate under the alternative approaches outlined in the data section in which the full PFD and half the size of the PFD are added to family income in order to calculate poverty, mindful of the possibility that a significant number of households did not report the PFD to the ACS. The subsequent three columns present the observed poverty rate for adult SSI/SSDI recipients in states other than Alaska, the estimated poverty rate if the PFD were a national program, and the percentage point reduction in the poverty rate if this program were national. The last column shows the approximate mean value of the PFD payment for each SSI/SSDI family if the program were national.

The effect of this hypothetical national transfer program would have been substantial. Poverty rates would have been reduced by as much as 10 percentage points, however for most years the percentage point reduction is roughly half of this. Importantly, if this program had been made national, the 3 percentage point increase in the poverty rate from 2000 to 2018 for this population would have been entirely eliminated.

Lastly, table 4 provides an estimate of the total national cost of this program. For any year, the set of estimates range by as much as $10 billion. These wide ranges are primarily due to the in-

Year	Alaska poverty rate - observed	Alaska poverty rate - addition of the full PFD	Alaska poverty rate - addition of half of the PFD	Poverty rate, excluding Alaska- observed	Poverty rate, excluding Alaska - addition of the full PFD	Percentage point decile in national poverty rate, excluding Alaska	Approximate mean dividend payment
2000	11.9	1.1	11.9	28	4.3	-23.4	4651
2001	8.8	2.4	5.1	27	5.9	-20.9	4163
2002	17.7	10.4	14.1	27	9.2	-17.9	3397
2003	7.1	3.1	6.6	29	17.8	-11.4	2378
2004	13.7	6.2	10.0	29	20.4	-9.0	1926
2005	15.7	11.3	14.6	30	22.1	-8.0	1715
2006	16.4	11.4	13.5	30	19.8	-10.5	2052
2007	19.4	5.9	7.6	30	11.5	-18.5	3017
2008	13.5	5.7	10.8	29	8.3	-21.2	3609
2009	5.2	4.1	4.7	29	16.3	-12.8	2282
2010	17.9	9.8	14.4	31	18.0	-12.8	2282
2011	23.0	7.5	16.4	31	20.6	-10.8	2014
2012	11.4	8.2	10.0	32	24.5	-7.9	1461
2013	24.0	15.0	19.2	33	25.0	-7.7	1476
2014	33.0	13.0	24.2	32	11.2	-21.2	3015
2015	29.2	11.3	19.1	31	9.7	-21.7	3310
2016	20.0	13.1	15.4	31	22.6	-8.2	1603
2017	21.1	18.0	19.8	31	22.5	-8.4	1681
2018	26.9	17.5	22.1	31	18.4	-12.8	2377

Table 3: Pre and post-PFD poverty rates for adult SSI and SSDI recipients

clusion of estimates of the total cost of this program if it did not provide a transfer to children as well as adults. The first two columns provide estimates using ACS data exclusively. The latter two columns use administrative data on the number of adult SSI and SSDI recipients nationally, including Alaska. The third column displays the product of the annual dividend amount and the adult SSI/SSDI population – meaning that children are not included in this calculation. The fourth column includes children by multiplying the total adult SSI/SSDI population by the mean family PFD transfer.

Year	Approximate total cost of the national program without children in 2019 USD billions, excluding Alaska	Approximate total cost of the national program with children in 2019 USD billions, excluding Alaska	Total adult SSI/SSDI recipients (from admin data) times the dividend amount, including Alaska	Total adult SSI/SSDI recipients (from admin data) times mean dividend amount, including Alaska
2000	21.87	34.68	25.69	41
2001	20.12	31.23	23.50	36
2002	16.93	26.12	19.98	31
2003	12.50	19.32	14.49	22
2004	10.22	15.84	12.12	19
2005	9.65	14.86	11.19	17
2006	13.38	19.60	14.48	21
2007	19.76	29.19	21.65	32
2008	22.83	33.46	26.98	40
2009	15.37	22.57	17.76	26
2010	17.18	26.02	17.75	27
2011	15.76	23.79	16.48	25
2012	11.65	17.44	12.40	19
2013	11.91	17.77	12.80	19
2014	24.60	36.60	26.27	39
2015	26.99	40.10	28.82	43
2016	12.98	19.13	13.93	21
2017	13.26	19.45	14.42	21
2018	18.38	26.76	20.36	30

Table 4: Aggregate cost of a hypothetical national PFD program in billions of 2019 USD

In 2018, the cost of SSI and SSDI for (non-retired) adults was roughly $200 billion annually for SSI and SSDI (CBO). Therefore, the cost of scaling the PFD nationally would cost roughly 1/10th the annual cost of these federal programs.

6 Conclusion

SSI and SSDI have been criticized for their potentially distortionary labor supply effects and for their inadequacy in terms of establishing income security. This later consideration is evidenced by rising rates of poverty among adult SSI/SSDI recipients. This paper shows that the Alaska PFD holds promise of serving as a viable income transfer program that does not affect employment, while holding enormous promise in terms of reducing poverty rates among adult SSI/SSDI recipients. There are, of course, limitations to the research described here. The simulated effects on poverty and the total cost estimates provided have wide ranges, given the assumptions these simulations rely on. Additionally, the sample size of the adult SSI/SSDI recipients is too small to pick up small effects. However, the general direction of the results provided staunchly point in favor of the two hypotheses outlined at the beginning of the paper. Overall, this paper provides strong evidence that SSI and SSDI payments may increase, particularly in the context of a national universal cash transfer program (e.g., universal basic income), without distortionary labor market effects and with the positive consequence of lowering rates of poverty among adults with disabilities.

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