Online Appendix for *Examining the Effects of a Universal Cash Transfer on Fertility*

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Data and Measures

Birth Counts: Natality Data

The fertility analyses use restricted natality data provided by the National Vital Statistics System for 1984 to 2010. These data contain the complete population of U.S. births and include a wealth of information on people who give birth, including their demographic characteristics. [1] For most of our analyses, we use only births to people residing in Alaska. Characteristics of people included in our analyses are age, racial identity, marital status, education and parity. Following convention, we group age into five-year age groups and restrict to ages 15 to 44. Given the racial composition of Alaska, we group racial identity into White, Alaska Native and other. Marital status is dichotomized as married and unmarried. We group educational attainment into less than high school, high school, some college and college degree or greater. Parity is coded as first birth, second, birth, third birth, and fourth or above birth.

[1]People of all gender identities give birth to children. We do not know the gender identity of people who give birth from the birth certificate data (our numerators). We construct denominators that are counts of people who report their sex as female on the Census or American Community Survey, which also does not ask about gender identity, to capture people at risk of giving birth. Recognizing this, we use gender-neutral language as much as possible. As Darwin and Greenfield (2019) note, "We have not yet developed shared language in research or practice to adequately describe reproductive histories outside of a cis birth mother's." For clarity, at times we use the term "women," though inaccurate, to refer to people at risk of giving birth to clarify that the group to which we refer does not include cisgender males.

Missing Data

In total, 4 percent of births had missing values on one or more covariate, though this ranged from 0.93 percent of births in 1996 to 15.3 percent of births in 2003. Multiple imputation was not feasible because the natality data do not contain enough parental characteristics to accurately predict missing values. To address missing data, we employed a threshold deletion strategy. Specifically, we chose a threshold of 7.5 percent and excluded from our analysis any year in which more than 7.5 percent of births had missing values on one or more covariates. Based on this threshold, we excluded 2001, 2003, and 2008 from our analyses. For all other years, we dropped all cases with missing values on covariates and then randomly dropped more observations until the percentage dropped reached 7.5 percent. That is, for all included years, exactly 7.5 percent of cases were dropped. We use this approach to ensure that the total number of births per year is not impacted by different rates of missing data across years. Because the rate model assesses changes in the number of births per year relative to the total number of women at risk of giving birth, we must be attentive to any data manipulations that alter the birth counts in some years and not others, as such changes could induce an artificial effect on birth rates. The threshold-deletion strategy ensures that birth counts for each year are artificially reduced by the same proportional amount. As a sensitivity analysis, we also tested alternative thresholds – 6 percent and 9 percent – and our results were not substantively altered.

Population Counts

In order to assess birth rates, we require population count denominators by Demographic Grouping. We obtained these in two steps. First, proportions of the population by Demographic Grouping were linearly interpolated from 1980, 1990, and 2000 Census five-percent samples and the 2008-2012 American Community Survey (ACS) sample. Second, these proportions were multiplied by intercensal population counts for women ages 15-44 by five-year age groups provided by the Alaska Department of Labor and Workforce Development (Alaska Department of Labor, 2014a,b). These population counts incorporate information from the applications to the annual Permanent Fund

Dividend, making them more accurate than those typically used in rate analyses that rely merely on intercensal interpolation. They have been used in other scholarly work, including one article on the PFD (Kozminski and Baek, 2017).

For our South Dakota placebo test, we also calculate birth rate denominators by Demographic Grouping for South Dakota. These counts are obtained from linear interpolation of Demographic-Grouping-specific counts of women from the 1980-2000 Censuses and 2008-2012 ACS.

Finally, we calculate the annual U.S.-level birth rate as a control. This is obtained by using annual counts of all births in the United States from the natality data as the numerator and linearly interpolated counts of women age 15-44 derived from the 1980-2000 Censuses and 2008-2012 ACS as the denominator. In the place of a U.S.-level control we also tested controls for demographically-similar states such as Utah and South Dakota, and the results were substantively similar but produced worse model fit (see Appendix Table **??**).

CDC Abortion Rates

Reliable abortion data are only available at the state-year level. We use abortion rates for Alaska and the country as a whole by year from the Centers for Disease Control for 1984-2010. Given the data are at the state level, we cannot assess group-specific effects.

Assessing Acclimation to PFD Payments

When a cash transfer occurs every year, it is possible that after an initial period of adjustment, individuals come to expect the dividend and anticipate it each year, removing its effect as an income "shock." The Alaskan dividend's variation over time allows us to assess whether such a normalization occurs by measuring jumps or dips in the dividend that can be thought of as unanticipated.

We performed a series of analyses assessing whether birth rates are more responsive to changes in the dividend amount than the absolute magnitude of the dividend itself. These analyses used two types of measures. First, we measured a given year's dividend amount as a deviation from prior years' average payment amounts. We created measures using multiple lags: one, three, and five years. Second, we regressed dividend payments on year for the previous three and five years and used the model results to predict the dividend amount in a given year. We then calculated the residual by subtracting the observed payment from the predicted payment.

We replicated our birth-rate analysis using the measures described above – deviations from averages and residuals from predictions – with one- and two-year lags to predict birth rates instead of the lagged dividend amounts used in the main analyses. Overall, these measures did not statistically significantly predict the birth rate, suggesting that the actual magnitude of the dividend payment matters more than the portion of the payment that might be unanticipated. This provides evidence against the normalization hypothesis. Exceptions were models using a measure of deviation from the average of the prior three years and the residual of a model predicting payments for the prior five years: These measures showed positive and statistically significant effects on birth rates, but their coefficients were smaller in magnitude than the coefficient of the actual dividend amount. The lack of evidence for adjustment or smoothing comports with the contemporary assessment of consumption responses to income changes (Jappelli and Pistaferri, 2010).

Table A1: Birth Rate Analysis with Macro-Economic Controls Added: Log-Rate Model Results

	AK Unemp. Rate Included	AK Income Included	Oil Price Included (Included in Main Text)
	IRR / 95% C.I.	IRR / 95% C.I.	IRR / 95% C.I.
DIV_{t-1}	1.018**	1.015**	1.016***
	(1.008 , 1.029)	(1.006 , 1.025)	(1.006 , 1.026)
DIV_{t-2}	1.019***	1.019***	1.019***
	(1.009 , 1.030)	(1.009 , 1.030)	(1.009 , 1.029)

Notes:

(1) Coefficients are incidence rate ratios. 95% C.I. in parentheses.

(2) Birth count source: U.S. Natality Detail File, 1984-2010.

(3) Population count sources: 1980-2000 Decennial Censuses and 2008-2012 American Community Survey.

(4) Total N = 11,696 Demographic Groupings; 240,285 births.

(5) *p<.05; ** p<.01; *** p<.001

(6) Controls are: Year (aligned to APF dividend disbursement), race, marital status, age, maternal education, parity, and U.S. birth rate.

(7) *DIV* refers to household dividend payments in 2010 constant dollars and adjusted for household size. It is measured in n $1,000 units.

(8) Macro-economic measures are Alaska unemployment rate, Alaska income per capita, and the crude price of oil. All measures are lagged two years.

Table A2: Effects of Alaskan PFD Payments on Anchorage Birth Rates: Log-Rate Model Results, 1984-2010

	Household Payment				Individual Payment	
	Model 1: Rate		Model 2: Rate w/ Decade F.E.		Model 3: Rate	
	IRR	95% C.I.	IRR	95% C.I.	IRR	95% C.I.
DIV_{t-1}	1.014*	(1.001 , 1.027)	1.009	(.995 , 1.023)	1.019	(.978 , 1.061)
DIV_{t-2}	1.023**	(1.009 , 1.037)	1.027***	(1.013 , 1.041)	1.056*	(1.012 , 1.102)

Notes:

(1) Birth count source: U.S. Natality Detail File, 1984-2010.

(2) Population count sources: 1980-2000 Decennial Censuses and 2008-2012 American Community Survey.

(3) Anchorage N = 9,168 Demographic Groupings; 93,231 births.

(4) IRR = Incidence Rate Ratios.

(5) * p<.05; ** p<.01; *** p<.001

(6) DIV refers to household dividend payments in 2010 constant dollars. It is measured in $1,000 units.

(7) Unit of analysis is Demographic Groupings - demographic groups of women determined by age, race, marital status, educational attainment, and parity.

(8) Controls are by age, race, marital status, educational attainment, parity, year, the U.S. birth rate, and the average crude price of oil lagged two years.

Table A3: Comparison of Alaska and South Dakota Demographics: 1980 and 2010

	1980		2010	
Measure	Alaska	South Dakota	Alaska	South Dakota
Educational attainment (%)[a]				
High School or higher	82.5	67.9	88.4	89.3
College Degree or higher	21.1	14.0	25.4	25.3
Median Age (years)[a]	26.0	28.9	33.8	36.9
Hispanic (%)[a]	2.4	0.1	5.5	2.7
Race (%)[a,b]				
White	77.1	92.6	66.7	85.9
Black	3.4	0.3	3.3	1.3
American Indian or Alaska Native	15.9	6.6	14.8	8.8
Asian or Pacific Islander	1.9	0.3	6.4	0.9
Other Race or Multiracial	1.6	0.2	8.9	0.9
Median Household Income (dollars)[c]	25,414	13,156	57,848	45,352
Poverty (%)[c,d]	10.7	16.9	9.9	14.4
Urban (%)[a,e]	64.4	46.4	66.0	55.3
Foreign-Born (%)[a,d]	4.0	1.4	7.0	2.7
Children Living with a Single Parent (%)[c]	19.3	13.6	21.7	27.6
Female (%)[a]	47.0	50.7	47.9	49.5
Fertility Rate[f,g,h]	90.5	88.3	80.1	77.3
Abortion Rate (%)[f,g]	22.1	9.0	14.7	5.5

Notes:

[a] Source: 1980 and 2010 U.S. Census.

[b] In the 1980 Census, individuals could report only one race. This changed from the 2000 Census onward, where individuals could report more than one race.

[c] Source: 1980 and 2010 Current Population Survey.

[d] Source: 2010 American Community Survey.

[e] The census definition of “urban” changed in 2000, from places of 2,500 or more to a density measure.

[f] Source: National Center for Health Statistics.

[g] Source: South Dakota Department of Health.

[h] Fertility rate is calculated as the number of births per 1,000 women aged 15-44.

Table A4: Effects of Alaskan PFD Payments on Birth Rates: Full Log-Rate Model Results, 1984-2010

Covariate	Coefficient	S.E.	IRR	95% C.I.
DIV_{t-1} (Thous.)	.016**	.005	1.016**	(1.006 , 1.026)
DIV_{t-2} (Thous.)	.019***	.005	1.019***	(1.009 , 1.029)
Year	.010***	.001	1.011***	(1.008 , 1.013)
Married	.533***	.018	1.704***	(1.644 , 1.765)
Parity				
Parity 2	.382***	.022	1.466***	(1.404 , 1.531)
Parity 3	.040	.028	1.041	(.985 , 1.099)
Parity 4+	.212***	.035	1.237***	(1.155 , 1.324)
Race				
Alaska Native	.484***	.018	1.622***	(1.565 , 1.682)
Other Race	-.011	.019	.989	(.953 , 1.026)
Education				
High School	-.114***	.021	.892***	(.857 , .929)
Some College	-.324***	.022	.724***	(.693 , .755)
Bachelor's or more	-.085**	.026	.919**	(.873 , .966)
Age				
20-24	.145***	.031	1.156***	(1.089 , 1.228)
25-29	-.106**	.031	.900**	(.847 , .956)
30-34	-.594***	.242***	.552***	(.519 , .587)
35-39	-1.419***	.033	.242***	(.227 , .258)
40-44	-2.946***	.037	.053***	(.049 , .0565)
US. Birth Rate	.037***	.004	1.038***	(1.029 , 1.046)
Crude Oil Price$_{t-2}$	-.000	.000	1.000	(.999 , 1.000)
Constant	-25.840***	2.891	.000***	(.000 , .000)

Notes:
(1) Birth count source: U.S. Natality Detail File, 1984-2010.
(2) Population count sources: 1980-2000 Decennial Censuses and 2008-2012 American Community Survey.
(3) Total N = 11,696 category IDs; 240,285 births.
(4) *p<.05; ** p<.01; *** p<.001
(5) Reference groups are: Parity 1, Non-Hispanic White, Less than High School, and Age 15-19.
(6) DIV refers to household dividend payments in 2010 constant dollars and adjusted for household size. It is measured in $1,000 units.
(7) IRR = Incidence Rate Ratios.

Table A5: Birth Rate Analysis with Varying Dividend Time Lags: Log-Rate Model Results

Covariate	IRR	95% C.I.
Lags 0, 1, 2; N = 11,696 Demographic Groupings		
DIV_t	1.005	(.988 , 1.0238)
DIV_{t-1}	1.013+	(.999 , 1.027)
DIV_{t-2}	1.019***	(1.009 , 1.030)
Lags 1, 2; N = 11,696 Demographic Groupings		
DIV_{t-1}	1.016**	(1.006 , 1.026)
DIV_{t-2}	1.019***	(1.009 , 1.029)
Lags 1, 2, 3; N = 11,208 Demographic Groupings		
DIV_{t-1}	1.012**	(1.001 , 1.022)
DIV_{t-2}	1.025***	(1.012 , 1.038)
DIV_{t-3}	.995	(.981 , 1.009)

Notes:

(1) Birth count source: U.S. Natality Detail File, 1984-2010.

(2) Population count sources: 1980-2000 Decennial Censuses and 2008-2012 American Community Survey.

(3) Total N = 11,696 Demographic Groupings; 240,285 births.

(4) + p<.10; *p<.05; ** p<.01; *** p<.001

(5) Controls are: Year (aligned to APF dividend disbursement), race, marital status, age, maternal education, parity, average price of crude oil lagged two years, and U.S. birth rate.

(6) DIV refers to household dividend payments in 2010 constant dollars and adjusted for household size. It is measured in \$1,000 units.

(7) If a dividend payment was not given during pregnancy, DIV_t is set to 0.

(8) IRR = Incidence Rate Ratios.

Table A6: Birth Rate Analysis with Various State Birth Rates as Control: Log-Rate Model Results

	Control Rate:				
	U.S.	South Dakota	New Mexico	Oklahoma	Utah
	IRR/(S.E.)				
DIV_{t-1}	1.016**	1.047***	1.048***	1.013*	1.012*
	(3.24)	(6.00)	(7.36)	(2.11)	(2.28)
DIV_{t-2}	1.019***	0.999	1.016**	1.009	1.009
	(3.65)	(-0.11)	(3.23)	(1.80)	(1.71)
Year	1.011***	1.018***	1.034***	1.008***	1.008***
	(7.31)	(8.17)	(9.83)	(5.18)	(4.56)
Married	1.704***	1.675***	1.631***	1.734***	1.737***
	(29.31)	(26.95)	(24.98)	(29.95)	(29.99)
Parity					
Parity 2	1.466***	1.443***	1.405***	1.492***	1.495***
	(17.33)	(16.06)	(14.63)	(18.03)	(18.08)
Parity 3	1.041	1.010	0.957	1.080**	1.083**
	(1.42)	(0.34)	(-1.41)	(2.73)	(2.82)
Parity 4+	1.237***	1.183***	1.088*	1.310***	1.316***
	(6.08)	(4.29)	(2.05)	(7.61)	(7.70)
Race					
Alaska Native	1.622***	1.622***	1.622***	1.623***	1.623***
	(26.20)	(26.12)	(26.19)	(26.13)	(26.13)
Other Race	0.989	0.991	0.990	0.991	0.991
	(-0.60)	(-0.50)	(-0.56)	(-0.50)	(-0.50)
Education					
High School	0.892***	0.892***	0.892***	0.893***	0.893***
	(-5.52)	(-5.50)	(-5.51)	(-5.45)	(-5.45)
Some College	0.724***	0.721***	0.722***	0.722***	0.722***
	(-14.73)	(-14.87)	(-14.81)	(-14.81)	(-14.80)
Bachelor's or More	0.919***	0.917***	0.918***	0.916***	0.916***
	(-3.31)	(-3.37)	(-3.31)	(-3.42)	(-3.42)
Age					
20-24	1.156***	1.156***	1.156***	1.156***	1.156***
	(4.72)	(4.71)	(4.71)	(4.70)	(4.71)
25-29	0.900***	0.900***	0.900***	0.901***	0.901***
	(-3.43)	(-3.41)	(-3.43)	(-3.37)	(-3.37)
30-34	0.552***	0.552***	0.552***	0.553***	0.553***
	(-18.83)	(-18.78)	(-18.81)	(-18.75)	(-18.75)
35-30	0.242***	0.242***	0.242***	0.242***	0.242***
	(-43.45)	(-43.35)	(-43.41)	(-43.29)	(-43.29)
40-44	0.0525***	0.0526***	0.0526***	0.0525***	0.0525***
	(-79.29)	(-79.14)	(-79.24)	(-79.09)	(-79.09)
Crude Oil Price$_{t-2}$	1.000	0.997***	0.997***	1.001	1.001
	(-0.46)	(-4.25)	(-5.95)	(1.32)	(1.66)
U.S. Birth Rate	1.038***				
	(8.84)				
SD Birth Rate		1.021***			
		(5.31)			
NM Birth Rate			1.044***		
			(7.89)		
OK Birth Rate				0.997	
				(-0.78)	
UT Birth Rate					0.997
					(-1.24)
N	11696	11696	11696	11696	11696
AIC	70440.7	70491.2	70457.4	70518.6	70517.7
BIC	70595.4	70645.9	70612.1	70673.3	70672.4

Notes:
(1) Birth count source: U.S. Natality Detail File, 1984-2010.
(2) Population count sources: 1980-2000 Decennial Censuses and 2008-2012 American Community Survey.
(3) Total N = 11,696 Demographic Groupings; 240,285 births.
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(6) *DIV* refers to household dividend payments in 2010 constant dollars and adjusted for household size. It is measured in $1,000 units.
(7) IRR = Incidence Rate Ratios.

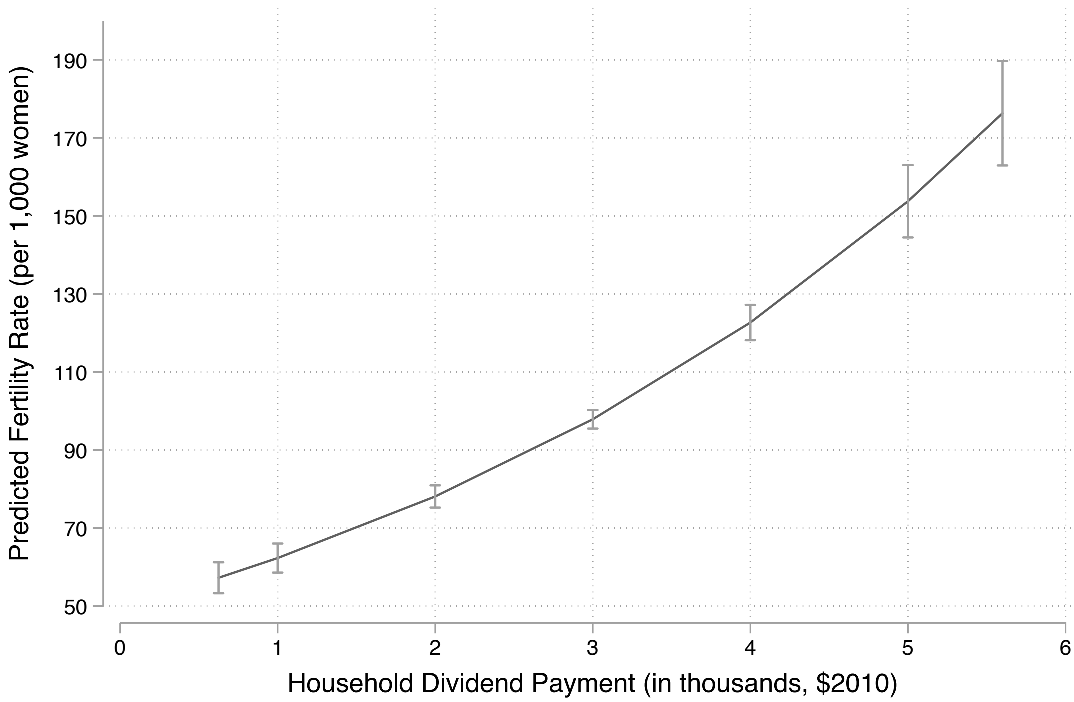

Figure A1: Predicted Fertility Rate for Quadratic Model. Predictions generated from a model that includes dividend payments at *t-1* and *t-2* as well as squared terms for each payment. All other covariates set to mean.

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