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Child Benefit Payments and Household Wealth Accumulation

Melvin Stephens Jr.

University of Michigan and NBER

Takashi Unayama

Policy Research Institute, Ministry of Finance, Japan

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Research Department Policy Research Institute, MOF

3-1-1 Kasumigaseki, Chiyoda-ku, Tokyo 100-8940, Japan

TEL 03-3581-4111

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Melvin Stephens Jr.† Takashi Unayama‡

Abstract

Using the life-cycle/permanent income hypothesis, we theoretically and empirically assess the impact of child benefit payments on household wealth accumulation. Consistent with the predictions of the model, we find that higher cumulative benefits received increase current assets, higher future benefit payments lower asset holding, and that these effects systematically vary over the life-cycle. We find different wealth responses to child benefit payments for liquidity constrained and unconstrained households as predicted by the model.

Keywords Household Consumption; Life Cycle Permanent Income Hypothesis

JEL Classifications D12; E21

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†University of Michigan and NBER

‡Policy Research Institute Ministry of Finance

1 Introduction

Child benefits, or cash transfers to families based solely on the number and/or age of their co-residing children, are prevalent in a number of industrialized countries. The exact policy goals that governments aim to achieve by providing these benefits vary which is reflected in the differences in the structure of these benefits across countries. Means tested benefits lead to relative improvements in household resources for low income families while higher benefit amounts for higher parity children offer a path to achieve pro-natalist aims.[1]

In Japan, the child benefit system (or "jidou teate" in Japanese) was introduced in 1972 as an important piece of social security programs.[2] The Child Benefit Act states that its goal is to contribute toward "stable family life" and "healthy upbringing of children" by making benefit payments to the parents and guardians of children.[3] Thus, policymakers likely had in mind that these benefits would immediately increase consumption upon receipt although the aforementioned quotes certainly do not rule out saving the benefits to offset adverse events or to provide for their children's future expenses.

In this paper, we examine the impact of the Japanese child benefit system on household wealth accumulation. Within the context of the standard life-cycle/permanent income model, regardless of the exact policy aims of the benefits, the contemporaneous impact of these benefits on household consumption and savings is unclear. On the one hand, these benefits may primarily be saved since the duration of benefit payments is limited and so they are treated as transitory income.[4] In fact, a recent survey by Japan's Cabinet Office finds that nearly 50% of Japanese households explicitly save the benefit for the child's future (Japan Times, 2010). On the other hand, however, liquidity constrained households may find it advantageous to use these benefits to increase current consumption and therefore save little or none of the benefit.

Using a basic life-cycle/permanent income hypothesis framework, we derive a number of predictions for the impact of child benefits on household wealth accumulation. Since most of the benefit will be saved, household wealth increases with the total amount of benefits that have already been received. In addition, since expected future benefits increase current consumption, household wealth is a decreasing function of expected future benefits. The model also yields a testable restriction on the parameters of the wealth equation on benefits received to date and expected future benefits which reflect the marginal propensities to save and spend out of benefit payments.

To test these theoretical predictions, we exploit a number of changes in child benefit eligibility

[1] Van Lancker, Ghysels, and Cantillon (2012) provide an overview of child benefits in a number of European countries.
[2] Jidou Teate is sometimes translated to child allowance, but hereafter we use child benefit for consistency.
[3] Article 1 of Child Benefit Act. See http://law.e-gov.go.jp/htmldata/S46/S46HO073.html (in Japanese).
[4] Moreover, families may believe, in a Ricardian equivalence sense, that the future tax liabilities necessary to finance current benefits requires them to save most of the benefit to offset future tax increases including increased bequests to heirs (Barro 1974).

and benefit amounts. Benefits were initially only available for families with three or more children, before opening up to families with at least two children in 1986 and finally to single child families in 1992. In addition, benefits were initially paid until the child reached age fifteen although the benefit payment period was drastically reduced until age three in 1992 before gradually being increased back to age fifteen by 2010. Furthermore, benefit levels were substantially increased beginning in the mid-1990s. The resulting combinations of reforms generate substantial variation in the benefits received by households, as well as the expected future benefits, and allow us to estimate the impact of child benefits on household wealth accumulation.

Using data on household wealth collected as part of the Japanese Family Income and Expenditure Survey, we estimate the impact of child benefits received on household wealth. Consistent with the model predictions, we find that cumulative benefits received to date increase household assets, while increases in future benefits reduce the stock of wealth. We cannot reject the restriction that the sum of the coefficients on benefits paid to date and expected future benefits in the household wealth equation should be one, which is implied by the model. We also find evidence consistent with another prediction of the model that those coefficients change systematically over the life-cycle although alternative specifications yield mixed evidence. In addition, we present results separately by asset class and find that most of the increase occurs in illiquid assets such as life insurance, stocks ("equity"), and "time deposits."

Finally, the predictions from the basic life-cycle model are strongly aligned with our findings for a subsample of households that likely do not face liquidity constraints in that the benefits are mostly saved. Our results for constrained households are strikingly different from those of the unconstrained households although our findings for the constrained subsample are only partially consistent with the predictions for these households based on the life-cycle model.

Our examination of household wealth is a departure from most of the prior literature that has examined the effects of child benefits. Previous papers have examined the impact of child benefits on fertility decisions (Milligan 2005; Cohen, Dehejia, and Romanov 2013; González 2013) and child well-being (Milligan and Stabile 2009, 2011). González's paper is the most closely related to ours in that she examines the impact on consumption and labor supply albeit in response to a one-time fertility payment for new births in Spain that began in July 2007. Using a regression discontinuity design, she finds that Spanish households did not change their total expenditure at the time when births became eligible for payments. However, she finds a reduction in the work effort of mothers for the first year after child birth and a corresponding decline in day care expenditures. Taken together, her results suggest that families "spent" the benefit on increased non-market time of the wife although the effect on savings is not investigated.

Our study also contributes to the vast literature which tests the life-cycle/permanent income hypothesis. Studies examining how households respond to transitory income shocks typically use the Euler equation framework to test whether consumption changes respond to income changes (e.g., see the studies cited in the survey by Jappelli and Pistaferri, 2010). Campbell's (1987) insightful approach uses the model to yield predictions for how annual savings flows respond to changes in expected future income. We do not have information annual savings flows but rather extensive details on the stock of household wealth. To take advantage of this data, we derive implications for how transitory income payments, both past and future, affect the stock of wealth within the life-cycle/permanent income framework. As such, our approach is complementary to the prior literature.

The paper is set out as follows. The next section discusses the history of Japan's child benefit system including the variation in benefit eligibility and payment amounts that we will exploit in our empirical analysis. The following section examines the theoretical implications of child benefit payments on wealth, the data that we use in our analysis, and our empirical specification. We then turn to our empirical results before concluding in the final section.

2 Japan's Child Benefit Program

The child benefit system was introduced in 1972 as an important component of Japan's social security programs. The Child Benefit Act states that its goal is to contribute toward "stable family life" and "healthy upbringing of children" by making means-tested benefit payments to the parents and guardians of children although the effective objective has been changed over time. In the 1970s, the benefit was a pro-natalist policy focusing on households with many (three and more) children. In the mid-1980s, it worked as a device for redistribution between generations to compensate for the public pension premium required under the pay-as-you-go pension system which was introduced in 1985. After the 2000 revision, the act again became one of the countermeasures to the falling birth rate. Reflecting these changes in the policy purpose, benefit eligibility and amounts have varied over time based on the number and ages of children.

As shown in Table 1, in which a brief history of the Child Benefit Act, the scope of the act has been expanded twice with regards to the child parity at which the household becomes eligible for benefits. Households with at least three children have been beneficiaries of child benefits since the program's inception. In 1986, families with two or children became eligible to receive benefits. Families with one child became eligible to receive benefits in 1992. Not surprisingly, these changes increased the incidence of benefit receipt among younger parents.

The child ages at which benefits are distributed have also changed over time. While the age threshold for benefits was fifteen when the system was introduced, the eligibility age was reduced to three when the first child became eligible in 1986.[5] However, after policymakers decided to use child benefit payments to encourage higher fertility, the age limit has been raised repeatedly. The age cutoff increased to six in 2000, to nine in 2004, to twelve in 2006, and to fifteen in 2010.

Child benefit payments have undergone long periods during which the benefit amounts remained fixed in nominal terms as the benefits have never been indexed to prices. In the 1970s and early 1980s, the benefit levels were gradually increased but effectively remained stable in real terms. Beginning in 1992, benefits were set at five thousand yen per month for first and second child and at ten thousand yen for each additional child. In 2006, the monthly benefit amount was set at ten thousand yen regardless of parity but only until age three. Benefits were significantly increased between 2010 and 2012, when the Democratic Party of Japan (DPJ) was in power and the system was called "kodomo teate" in Japanese. Benefit levels were subsequently decreased after this period, but still higher than in the pre-DPJ period, and the Japanese name of the act was changed back to jidou teate.

These frequent changes generate large differences in the lifetime benefits received among close birth cohorts as is shown in Figure 1. For example, a family's first child who was born in 1986 was never eligible for benefits while the cumulative benefits for a first child born in 1990 totaled 120 thousand yen (roughly, one thousand dollars). A first child born in 1997, not too many years later, is eligible for fifteen years of benefit payments totalling more than one million yen (about 10 thousand dollar).

To provide an alternative view on how benefit levels evolve over time, Figure 2 shows, by the birth year of the oldest child, the ratio of annual household child benefits to yearly income averaged across all JFIES families with children.[6] For families in which the oldest child was born in the 1970s, benefits represent less than one percent of annual family income. For oldest children born in the 2000s, benefits are over three percent of annual income. Prior work by Browning and Crossley (2001) suggests that it is not costly in terms of lifetime utility to deviate from the life-cycle model when payments induce small fluctuations to annual income. Based on their insights, it would not be surprising to find evidence rejecting the life-cycle model with respect to child benefit payments.

[5] The effective eligible age was 5 in 1972 and 10 in 1973 as a transition.

[6] Due to low levels of reporting of child benefits in the JFIES, we construct annual benefit amounts rather than using reported benefit payments. These values account for the means-testing feature of the program. We provide more details on the computation of these benefits in the next section.

3 The Impact of Child Benefit Payments on Wealth

3.1 Theoretical Framework

To understand the impact of child benefit payments on wealth, we examine a finite-lived household's maximization problem. Assuming that utility is intertemporally separable, δ is rate of time preference, and r is a constant interest rate, households choose consumption, C_t, in each period $t = 1, 2, ..., T$ to maximize utility over of the remainder of their lifetime

$$E_t \sum_{j=0}^{T-t} \left(\frac{1}{1+\delta} \right)^j U(C_{t+j}) \tag{1}$$

subject to the equation for the evolution of assets (after receiving income but before choosing consumption), A_t,

$$A_{t+1} = (1+r)(A_t - C_t) + Y_{t+1} \tag{2}$$

where Y_t is income in period t and T is fixed. As shown in Zeldes (1989b) and Carroll (1997), under the assumptions that the period-specific utility function exhibits constant relative risk aversion, $r = \delta$, and future income is known, the solution for consumption in each period is

$$C_t = k_t[A_t + H_t] \tag{3}$$

where

$$k_t = \left(\frac{r}{1+r} \right) \left[\frac{1}{1 - (1/1+r)^{T-t+1}} \right] \tag{4}$$

and

$$H_t = \sum_{j=1}^{T-t} \left(\frac{1}{1+r} \right)^j Y_{t+j} \tag{5}$$

Optimal consumption in each period is a proportion, k_t, of current period assets, A_t, and future income, H_t. Thus, k_t is the annuity value of lifetime wealth which further simplifies to spending a constant share in each period of $k_t = 1/(T - t + 1)$ when $r = 0$.

The effect of child benefit payments on consumption in each period follows directly from (3). Suppose that households receive an annual child benefit payment of P for a total of $C < T$ years, beginning at $t = 1$, such that lifetime child benefits received are $LCB = C \cdot P$.[7] Assuming $r = 0$, the child benefit increases consumption by a constant amount $LCB/T = CP/T$ in each period.

[7] This formulation of the problem ignores the possibility of future benefits changing due to having more children, children aging out of the program, and anticipated programmatic changes. It also assumes that benefit payments begin in the first period. We restrict $C < T$ since when $C = T$ child benefits are simply a permanent increase in income and spending will increase by P every period and, thus, the impact on saving will be zero. However, this simple approach highlights the main insights that we test in our empirical investigation below while keeping the notation as simple as possible.

As shown in Figure 2, child benefit payments, P, range from one to three percent of annual income. If these benefits were received every year for the rest of the household's lifetime (i.e., if $C = T$), then the model would predict a permanent increase in consumption of the same magnitude. However, given that benefits are only received from three to fifteen years, the predicted increase in consumption, which is proportional to C/T, is far smaller. Such small changes in consumption are likely difficult to find in monthly consumption data especially given the reporting errors found in survey data.[8]

By the same token, the model implies that payments should be mostly saved, especially if the benefits are only paid for short period of time. During the years that families are receiving benefit payments, household wealth increases as households continue to primarily save their benefit payments. Thus, while benefit payments may have little effect on consumption, if households are behaving in a manner consistent with the model then the impact on the stock of wealth is potentially quite sizable.

We can determine the impact of child benefits on the accumulated assets in period t, CBA_t, which is the difference between total child benefits paid to date, PB_t, and the total spending increase to date due to the child benefit, TS_t. Given our assumption that benefit payments begin in period 1, total benefits paid to date are $PB_t = \min(tP, LCB)$ which accounts for the cap in lifetime benefits of LCB. Total spending to date, assuming $r = 0$, is the sum of the constant spending amount over the first t periods, $TS_t = t \cdot (CP/T) = (t/T) \cdot LCB$. Thus, the amount of the child benefit received to date that should be saved for future spending is

$$CBA_t = PB_t - (t/T) \cdot LCB. \tag{6}$$

Notice that we can further simplify this last expression by noting that the lifetime child benefits, LCB, are the sum of child benefits paid to date, PB_t and expected future child benefit payments, FB_t, or, $LCB = PB_t + FB_t$. Inserting this definition into (6) yields

$$\begin{aligned} CBA_t &= PB_t - (t/T) \cdot LCB \\ &= PB_t - (t/T) \cdot (PB_t + FB_t) \\ &= (1 - (t/T))\, PB_t - (t/T) FB_t \end{aligned} \tag{7}$$

This expression for the amount of child benefits saved for subsequent spending yields a number of implications, all of which we test in our analysis below.[9] First, assets are increasing in benefits paid

[8]Stephens and Unayama (2014) finds that only one quarter of eligible households correctly report receiving the child benefits.

[9]Implicit in equation (7) is that past and future benefit amounts are appropriately discounted to year t. In our empirical work, we make these adjustments as we discuss below.

to date, PB_t, since $1 - (t/T) > 0$, and are decreasing in the amount of expected future benefits to be paid, FB_t. This result is a standard implication of the basic life-cycle model in which households spread lifetime benefits equally across all periods. Increases in past benefits lead to more saving due to the desire to increase both current and future spending. Similarly, increases in future expected benefits, holding constant past benefits received, yield higher spending to date and thus reduces accumulated assets.

Second, these effects systematically vary by the age of the household. Since households spend a constant fraction of lifetime benefits in each period, the share of child benefits received to date that remain unspent, $1-(t/T)$, is decreasing with age. The positive effect of benefits received to date falls as t increases while the negative effect of future benefits increases in magnitude (i.e., becoming more negative) as t grows.

Third, the difference between the parameters multiplying PB_t and FB_t is $(1-(t/T))-[-(t/T)] = 1$. This equality is due to the fact that in the basic life-cycle model, households spend a constant proportion, $1/T$, out of lifetime child benefits, LCB, in each period. Whether or not these benefits have yet to be paid, i.e., whether in PB_t or FB_t, is irrelevant to the household's decision in the model and thus yields the relationship between the coefficients on these two measures of benefit payments. Alternatively, since the coefficients on PB_t and FB_t are the propensity to save out of paid benefits and (the negative of) the propensity to spend out of future benefits, respectively, and since households treat past and future benefits equally in their decisions, these two propensities should sum to one.

Finally, the responses we have described above assume that households do not face credit market constraints. The behavior of households facing liquidity constraints no longer follows the standard Euler equation. Instead, the inability to smooth consumption by borrowing from future income raises the marginal utility of current consumption (Zeldes 1989b). Constrained households will consume most, if not all, of income depending on the magnitude of the payment. As such, we would expect increases in PB_t to have no impact on the current stock of wealth among constrained households. However, a large enough increase in PB_t could alleviate the constraints on some households in which case PB_t may have an effect on wealth. Similarly, while increases in FB_t cannot increase current consumption of constrained households, it is possible that large enough increases in FB_t make previously unconstrained households face become constrained.[10] Thus, we expect that the wealth response to PB_t and FB_t to be zero for constrained households except for those households caused to change from constrained to unconstrained, or vice versa, due to changes in benefit payments.[11]

[10] E.g., upon learning of a future bequest, net savers may want to become net borrowers but may be constrained from doing so.

[11] While the benefit increases were not large enough to such that they likely caused many households to change constrained status, we raise these possibilities primarily to note that the model predictions are not as straightforward for constrained households as they are for unconstrained households.

Our approach to testing the life-cycle/permanent income hypothesis is most closely related to that of Campbell (1987). Based on the infinitely-lived consumer version of (3) and noting that in each year income equals consumption plus saving, Campbell derives an equation for the annual savings flow as a function of changes in expected future income. Building upon Campbell's insight, we derive predictions for how child benefit payments, both past and future, affect the current stock of wealth. Alternatively, we could examine the impact of child benefit payments on consumption. However, each additional yen in benefits, whether past or future, increases current consumption by $1/T$ annually (or $1/(12 \cdot T)$ monthly) meaning that there is no difference in the response between PB_t and FB_t. While this result yields a testable restriction, it is also the case that the predicted increase in consumption is quite small, especially at the monthly frequency for which we have consumption data in the JFIES. As such, the power to test whether or not household behavior is consistent with the model is quite limited when exploiting differences in benefit amounts across cohorts. Instead, we utilize the predictions for the impact on wealth to test the life-cycle/permanent income hypothesis.

Before proceeding, we should note that a more standard approach to testing the life-cycle/permanent income hypothesis would be to test whether monthly consumption changes are affected by the timing of child benefit payments. Exploiting the fact that these benefits are paid only three times a year, Stephens and Unayama (2014) find a small but significant response of monthly consumption at the time child benefits are received. The findings in that paper indicate that 5-6% of child benefit payments are consumed in the month that they are received. However, this approach does not test whether consumption is increased across *all* months due to increases in child benefits as is predicted by the model. By examining wealth accumulation, we can examine longer-run responses to benefit payments which implicitly answers the question of whether these benefits lead to a permanent consumption increase.

3.2 Data

We use data from the Japanese Family Income and Expenditure Survey (JFIES) for 1981-2010.[12] The JFIES is a household survey in which respondents are asked to record all income and expenditure in a daily diary for six months. Prior to 2002, the JFIES only collected information on financial assets and liabilities in January for the sub-sample of households whose first month of participation in the JFIES was in the preceding August, September, or October. This wealth survey is called the Family Saving Survey (FSS). Beginning in 2001, the FSS format was abolished. Instead, the JFIES now collects financial information from all households during their third month of participation in the survey.

[12] More information about JFIES can be found in Stephens and Unayama (2011).

For our analysis, we limit the sample to "nuclear families" which we define as a couple with co-residing unmarried children. As such, childless couples and intergenerational households are dropped since we do not have information on the ages and number of children who have left the house. We also limit our sample to households whose head is younger than age 60 since large retirement bonuses, which skew the wealth distribution, are generally distributed at this age (Stephens and Unayama 2012).

Our analysis requires measures of the cumulative child benefits received and expected future child benefit payments as of the date that financial asset information is recorded. In principle, our knowledge of the changes in the benefit structure over time allows us to compute these amounts based on ages of the children in the household. However, two issues complicate this simple calculation. First, the couple may have children who have already moved out of the household in which case we would underestimate cumulative child benefits received. To circumvent this concern, we limit the sample to households with no children over age thirteen. Among families with at least two children in our sample, the second child is five or more years younger than the oldest child in less than nine percent of households. As such, limiting the oldest child to age thirteen captures the vast majority of couples for whom all of their children are still living with their family.

Second, child benefits are means tested each year based on current annual income of the household head leading to reduced or zero benefits for high income families. We can compute the head's income for the six months during which the family participates in the JFIES. However, due to widespread use of bonus payments by employers, we might substantially understate the head's income if we simply doubled the six month total from the survey period. Instead, we make use of the household's annual income for the twelve months prior to survey participation which is asked upon joining the JFIES sample. More precisely, the means test is applied to household income multiplied by 0.837 since income of the household head accounts for 83.7% of household income on average. Using this approach, nearly 75% of children in our sample are counted as recipients whereas more than 80% of eligible age children actually receive the benefit after 2000. Thus, we are slightly conservative in our implementation of the means test.

A related concern is that, although we can determine if the household is above or below the means-testing threshold for the current year, we cannot determine whether or not the same was true in previous years. Thus, households exceeding the income threshold in the current year are assigned zero benefits for all years while households below the threshold in the current year are assumed to have been receiving benefits in all prior years. Given that household income tends to rise with age, on average, for households prior to the head's retirement, our assumption is likely not too restrictive.

Table 2 contains summary statistics for the full sample of 22,543 observations. For this table, as well as our empirical analysis, we convert all yen values to 2010 yen using Japan's CPI. In addition, we use the ten year T-bill interest rate to create present values for the two accumulated measures: child benefit payments received to date and expected future child benefits. On average, households hold one year's worth of income in financial assets. Cumulative child benefit payments amount to roughly ten percent of household wealth while expected future child benefits are slightly higher.

Due to the changes in the child benefit program over time, households that began having children in earlier years received smaller amounts of child benefits both because benefit levels were lower and the required parity to receive these benefits was higher. Table 3 shows that, when dividing families by the birth year of their oldest child, those families having children when benefits were higher also have higher accumulated wealth. Since these correlations are only suggestive, we next turn to our regression analysis to exploit the benefit reforms to identify the effect of child benefits on wealth.

3.3 Empirical Specification

We estimate the impact of child benefit payments on household assets based on the implications generated by equation (7) and accounting for the policy variation in the child benefit. Thus, the equation we estimate is

$$A_{i,t} = \alpha + Z_{i,t}\gamma + \beta_1 PB_{i,t} + \beta_2 FB_{i,t} + \epsilon \tag{8}$$

where $Z_{i,t}$ includes the age of the household head, the number of household members, the age(s) of the children, year and month indicators, and an indicator for house ownership. We include a complete set of indicators for the age of the household head. To account for the age distribution of the children, we include variables for the number of children at each age from infants (i.e., age 0) through age thirteen.[13]

Thus, holding constant the child age distribution and calendar year and month effects, identification of the coefficients on $PB_{i,t}$ and $FB_{i,t}$ is due to variation in the policy reforms that affect the child benefit payment structure. The theoretical model predicts that the corresponding coefficients on $PB_{i,t}$ and $FB_{i,t}$ are $\beta_1 = 1 - (t/T)$ and $\beta_2 = -(t/T)$, respectively.

A number of assumptions are required to implement our identification strategy. We assume that the number of children and the timing of child births are exogenous. We also ignore the possibility of future child benefit payment increases, due to planned increases in fertility, affecting current savings decisions. Given the evidence cited above about the impact of child benefits on fertility in other countries, these assumptions are admittedly strong. Accounting for these effects requires a dynamic

[13] The impact of the age of the children on household wealth, holding constant the age of the household head, is unclear. On the one hand, households with older children will have incurred child costs over more years which leads to lower wealth levels. On the other hand, households with older children may have accumulated more wealth in preparation for large future costs, e.g., college tuition.

structural model that is beyond the scope of this paper. Rather, we focus on testing whether observed household savings behavior is consistent the basic life-cycle/permanent income hypothesis.

4 Results

Table 4 presents our main regression results based on equation (8).[14] Column (1) presents the results from the "naive" specification in which we include child benefits paid to date, PB_t, but exclude expected future benefits, FB_t. These results indicate that roughly half of the child benefits received to date have been spent. We can reject the null hypothesis that the coefficient is one, that is, that households save their entire child benefit payments.

As shown in equation (7), however, the correct specification should include expected future benefits, FB_t along with PB_t. As shown in column (2) of Table 4, when we include FB_t the coefficient on PB_t is effectively unchanged, again indicating that households spend roughly half of the child benefits. We find a negative and significant coefficient on expected future benefits which is consistent with the theoretical predictions that higher expected future benefits lead to lower levels of current asset holdings.[15]

Another prediction of the model found in equation (7) is that the difference between the coefficients on PB_t and FB_t equals one. This difference between these coefficients shown in column (2) is 0.68 - (-0.50) = 1.18. Given that the p-value for this test, also shown in Table 4, is 0.60, we cannot reject the null hypothesis that the difference is equal to one as implied by the theory.

The estimates also allow us to back out the relevant time horizon over which households are making their decisions. Combining the theoretical model with our findings in the second column of Table 4, we estimate that $-t/T = -0.50$. Assuming that households begin spending child benefits in a manner consistent with the model upon the birth of their oldest child, we can estimate t with average age of the oldest child which is approximately six years of age based on the summary statistics shown in Table 2. Using these results, we estimate that $T = 12$ which is roughly the average period over which households in our sample receive child benefits. However, this finding is relatively small given that the average age of household heads is 35 in our sample and the model predicts these benefits will be spent evenly over the remainder the household's lifetime. We return to this finding below.

The remaining columns in Table 4 present our results when we vary the cutoff age for the oldest child from thirteen to either twelve (columns (3) and (4)) or fourteen (columns (5) and (6)). Not surprisingly, the point estimates remain qualitatively unchanged as the sample size changes. In

[14] We only present the estimates for the coefficients on PB_t and FB_t in the tables below. The full results which the estimated coefficients on the remaining regressors are available from the authors upon request.

[15] The relative small change in the coefficient on PB_t when FB_t is included suggests that the correlation between these two variables, conditional on the other variables in the model, is rather small. In fact, estimating a specification similar to equation (8) except using FB_t as the outcome yields a coefficient of 0.07 on PB_t.

addition, we continue to fail to reject the restriction that the difference between the two primary parameters of interest equals one.

The remaining prediction from equation (7) that we test is that the coefficients on PB_t and FB_t systematically change as the household ages. The model predicts that the coefficient on cumulative benefits, $(1-(t/T))$, is one when children are first born and then linearly falls to zero. The model also predicts that the coefficient on future benefits, $-(t/T)$, begins at zero and linearly moves to -1 with t.

We estimate a modified household asset equation

$$A_{i,t} = \alpha + Z_{i,t}\gamma + \delta_1 PB_{i,t} + \delta_2 PB_{i,t} \cdot t + \phi_1 FB_{i,t} + \phi_2 FB_{i,t} \cdot t + \epsilon \tag{9}$$

where the model predicts that when children are first born $\delta_1 = 1$ and $\phi_1 = 0$ and that as the children age, impact of the benefits are becoming more negative, i.e., $\delta_2 < 0$ and $\phi_2 < 0$.[16]

Two difficulties arise in empirically testing these predictions involving the change in the coefficients with age is in defining the appropriate measure of age. First, benefit payments begin in the first period so an appropriate age measure should begin when families first have children. From that standpoint, the age of the oldest child in the household is the most appropriate measure of t. To examine the robustness of our results, we also use the average age of all children in the household and the age of the youngest child as measures of t. Second, there is bound to be a high degree of collinearity between the benefit measures and the interactions of these measures with the child age measures.

Our results from estimating equation (9), shown in Table 5, yield mixed evidence for these predictions. As mentioned above, the different columns in the table correspond to different measures of child age. In column (1), when using the age of the oldest child to measure t, we cannot reject the null hypotheses that the main effects on PB_t and FB_t are one and zero, respectively. However, the standard errors are quite large on these estimates.[17] We also find that the interaction terms both have negative coefficients, as predicted by the model, with the coefficient on the interaction term for future benefits being marginally significant.[18] The results using average child age shown in column (2) are qualitatively similar although the interaction term for cumulative benefits is positive but insignificant. The results using the youngest child age shown in column (3) are the least consistent with the model although as we noted above, the age of the oldest child is the most appropriate measure

[16] More specifically, the model predicts that $\delta_2 = \phi_2 = -(1/T)$ under the assumption that T is the same for all households. Given heterogeneity in T across households, we only test the prediction that these coefficients are negative.

[17] Since PB_t is increasing in child age, the difficulty in separately identifying the effects of $PB_{i,t}$ from those of $PB_{i,t} \cdot t$ is reflected by the increase in the standard errors on the estimates shown in Table 5 as compared to those in Table 4. The same difficulty arises for the estimates corresponding to while $FB_{i,t}$. While these estimates are lacking precision, they are still identified due to the legislative changes in both benefit amounts and the number of years that households are eligible for benefit payments.

[18] We also cannot reject the null hypothesis that the coefficients on the interaction terms are equal.

of t.

Next, we examine the impact of child benefits on the distribution of financial holdings in Table 6. The JFIES collects financial holdings separately for a number of asset categories. We find significant effects of child benefit payments across nearly all of these categories. Interestingly, the biggest effects are in "time deposits," "life insurance," and "equities," all of which are illiquid to some extent. These findings are consistent the Cabinet Office's survey findings which we discussed in the introduction in which nearly half of households report saving the child benefit for their children's future. Surprisingly, we find opposite signed results for normal deposits which are the most liquid form of assets. Since we find that overall wealth is increased due to higher child benefits, one possible explanation for this last finding is that child benefit increases may lead parents to concentrate on more illiquid assets that have also have higher rates of return. Unfortunately, we are unable to investigate this possibility any further with the data at hand.

Finally, we examine the impact of liquidity constraints on our predictions for wealth accumulation in equation (7). First, since liquidity constraints raise the marginal utility of consumption, households will increase current spending in an attempt to smooth the marginal utility of consumption between periods (Zeldes 1989a). This inability to smooth consumption across periods eliminates savings out of past benefits and yields a coefficient on PB_t of zero. Second, higher future benefits further hinder the ability of households to smooth. However, given that constrained households will already have reduced their savings to zero (under our assumption that future income is known), we would not expect higher future benefits to affect savings and thus anticipate a coefficient on FB_t of zero. Third, we no longer expect the difference between the estimated coefficients on PB_t and FB_t to equal one.

Following Zeldes (1989a), we split our sample between likely unconstrained and constrained households. Since assets are our outcome of interest, we split the sample based on the household's income in their yearly income which is a measure collected at the first interview and corresponds to the twelve months prior to this interview. To account for income growth both over the business cycle and over the life-cycle, we rank households based on the income within calendar year-age cells.[19]

Our empirical investigation into the role of liquidity constraints is shown in Table 7. While we present results for sample splits both at the median (columns (1) and (2) of Table 7) and the 25th percentile (columns (3) and (4)) of yearly income, we focus our discussion on the findings around the median as we find similar qualitative results at the 25th percentile. For households above median income, we see that the coefficient on PB_t is not significantly different than one, implying that most of the child benefits are saved. In addition, using the estimated coefficient on FB_t of -0.13 to infer the time horizon, we back out an estimate of $T = 46$ which is nearly four times as large as our estimate of

[19] We define age based on five year age bands: 25-29, 30-34, etc.

$T = 12$ that we found with the full sample.[20] Finally, we cannot reject the hypothesis implied by the model that the difference between the coefficients on PB_t and FB_t equals one for the unconstrained sample.

We find strikingly different results for our constrained sample. First, the coefficient on PB_t is not significantly different than zero which is consistent with the prediction that constrained households will consume all of their child benefit payments as they are received. Second, we find a negative and significant effect of future benefits on current savings among the constrained group which runs contrary to our prediction. However, if future income is uncertain (as opposed to the assumption in our framework), liquidity constrained households may still hold some assets to protect against future negative income shocks (e.g., if income draws can possibly equal zero in all future periods). Since higher future benefits increase the marginal utility of current consumption of constrained households, these increases may raise the willingness of constrained households to take on current debt when income is uncertain. Thus, while the negative coefficient on FB_t is inconsistent with our prediction, this finding may be consistent with a model that incorporates uncertainty. Third, as we predicted, we reject the hypothesis that the difference between the coefficients on PB_t and FB_t equals one. Overall, our findings confirm that the wealth response to child benefit payments differs between liquidity constrained and unconstrained households.

5 Conclusion

While much of the previous literature on child benefit payments examines the immediate impacts on fertility and child well-being, we investigate the impact on wealth accumulation due to transitory (from a life-cycle perspective) transfer payments. Unlike much the prior literature, we derive and test implications of the life-cycle/permanent income hypothesis for the impact of transitory income on wealth accumulation. As such, our paper also contributes to the literature which tests whether household consumption and savings behavior is consistent with this model. As opposed the dominant Euler Equation approach which can only examine whether consumption increases at the time benefits are received, by examining the effects on wealth we can examine the long-run implications of the theory on consumption and savings behavior.

Consistent with the theoretical model, we find that past benefit payments increase current savings while expected future payments lower accumulated wealth. We cannot reject the restriction that the difference between the coefficients on accumulated and future benefit payments equals one. Moreover, we find evidence consistent with the prediction that the effects of past and future benefit payments vary over the life-cycle. While this last finding holds for our preferred use of the age of the oldest child

[20]We continue to use $t = 6$ based on the average age of the oldest child in the sample.

as the measure of the household's point in the life-cycle, the evidence is mixed when using alternative measures of household age. Finally, our findings demonstrate that, as predicted by the model, the response of wealth accumulation to child benefit payments differs for liquidity unconstrained and unconstrained households.

We do not test whether child benefit payments are subject to a "flypaper effect," that is, whether the additional household income due to these payments are spent entirely on child-related items. While the life-cycle model treats all income payments as fungible, policymakers may be interested in knowing whether these benefits are spent on child-related consumption. Such an investigation is beyond the scope of this paper. However, an analysis of this type would be quite challenging since it not only must examine spending changes at the time benefits are received but across all future years since we find that these benefit payments are saved as predicted by the life-cycle/permanent income hypothesis for unconstrained households.

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Table 1: History of Child Benefit Law in Japan[a]

Law Change	Eligible Child		Monthly Benefit (1,000 yen)			
Year	Birth Order	Age limit	1st/2nd Child	3rd+ Child	Age < 3	Earnings Test?
1972	3rd and Later	15[b]		3		Yes
1974	3rd and Later	15[b]		4		Yes
1975	3rd and Later	15[b]		5		Yes
1986	2nd and Later	6[c]	2.5	5		Yes
1992	All	3	5	10		Yes
2000	All	6[d]	5	10		Yes
2004	All	9[d]	5	10		Yes
2006	All	12[e]	5	10		Yes
2007	All	12[f]	5	10	10	Yes
2010[g]	All	15[b]	13	13		No
2011[h]	All	15[b]	13	13		No
2012	All	15[b]	10	15	15	Yes

[a]The law change year indicates the year of enforcement. Transitional provisions were introduced for every law change.
[b]Before completing the junior high school.
[c]Before entering the elementary school.
[d]Until 3rd grade at elementary school.
[e]Until 6th grade at elementary school.
[f]Until 6th grade at elementary school.
[g]The law was called "Kodomo teate".

Table 2: Summary Statistics[g]

Variable	Mean	Std
Age of Oldest Child	5.9	3.8
Age of Household Head	34.9	5.8
Number of HH members	3.9	0.8
Yearly Income (1,000 yen)	4,259	1,395
Child Benefits Received to Date	379	447
Expected Future Child Benefits	383	726
Total Financial Asset	4,345	5,138
Deposit	732	1,436
Time Deposits	1,603	2,898
Life Insurance	1,484	2,388
Equity	151	930
Loan Trust	34	389
Bond	75	586
Other	175	717
N	22,543	

Table 3: Total Child Benefits Received and Financial Assets By Birth Year of the Oldest Child

Birth Year of the Oldest Child	N	Age of the Oldest Child		Age of Household Head		Child Benefits Received to Date		Expected Future Child Benefits		Total Financial Assets	
		Mean	Std	Mean	Std	Mean	Std	Mean	Std	Mean	Std
Before 1987	3,379	7.2	3.6	35.3	5.3	158	240	89	183	3,696	3,781
1987-1991	1,720	5.1	3.9	34.3	5.9	198	255	48	85	4,179	4,586
1992-1999	8,712	6.6	4.0	35.9	6.4	673	555	318	538	5,050	6,202
After 1999	8,732	3.5	2.7	33.7	5.6	479	400	1,145	1,069	4,603	5,714

Table 4: The Impact of Child Benefits on Financial Assets[a]

	(1)	(2)	(3)	(4)	(5)	(6)
Child Benefits Received to Date	0.64**	0.68**	0.60**	0.66**	0.53***	0.54**
	(0.27)	(0.27)	(0.29)	(0.22)	(0.25)	(0.25)
Expected Future Child Benefits		-0.50***		-0.40**		-0.60***
		(0.12)		(0.13)		(0.17)
P-Value Test Difference Equals 1		0.60		0.86		0.67
Maximum Age of the Oldest Child	13	13	12	12	14	14
N	22,543	22,543	21,449	21,449	23,623	23,623

[a]This Table reports estimates based on equation (8) using the level of financial assets as the outcome. All columns report OLS regression results and include survey year indicators, survey month indicators, a home ownership indicator, and indicators for the age of the household hold. In addition, each column includes separate number of children of variables for each age from 0 to the maximum age of the oldest child. Standard errors are robust to heteroskedascity. *, ** , and *** represent significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Table 5: The Impact of Child Benefits on Financial Assets[a]
Including Interaction Terms

	(1)	(2)	(3)
Child Benefits Received to Date	0.35	-0.16	0.10
	(0.80)	(0.85)	(0.43)
Child Benefits Received to Date *Child Age	0.05	0.13	0.13*
	(0.07)	(0.10)	(0.07)
Expected Future Child Benefits	-0.18	-0.10	-0.20
	(0.24)	(0.24)	(0.21)
Expected Future Child Benefits *Child Age	-0.04*	-0.06*	-0.07
	(0.03)	(0.04)	(0.05)
Child Age Measure	Oldest Child Age	Average Child Age	Youngest Child Age

[a]This Table reports estimates based on equation (8) using the level of financial assets as the outcome. All columns report OLS regression results and include survey year indicators, survey month indicators, a home ownership indicator, and indicators for the age of the household hold. In addition, each column includes separate number of children of variables for each age from 0 to the maximum age of the oldest child. Standard errors are robust to heteroskedascity. *, ** , and *** represent significance at the 10 percent, 5 percent, and 1 percent levels, respectively. All columns use 28,290 observations.

Table 6: The Impact of Child Benefit on Financial Asset Portfolio[a]

	Dependent Variable:						
	Normal Deposit (1)	Time Deposits (2)	Insurance (3)	Equity (4)	Loan Trust (5)	Bond including Investment Trust (6)	Other (7)
Child Benefits Received to Date	-0.22***	0.26***	0.38***	0.12***	0.01	0.07***	0.12***
	(0.04)	(0.09)	(0.07)	(0.03)	(0.01)	(0.02)	(0.02)
Expected Future Child Benefits	0.10***	-0.23***	-0.30***	-0.03	-0.01	-0.01	-0.03**
	(0.03)	(0.06)	(0.05)	(0.02)	(0.01)	(0.01)	(0.01)
Average Share	28.4%	30.5%	32.9%	2.1%	0.3%	0.9%	4.1%
Share for Zero	15.0%	31.1%	30.5%	89.9%	98.7%	95.6%	82.5%

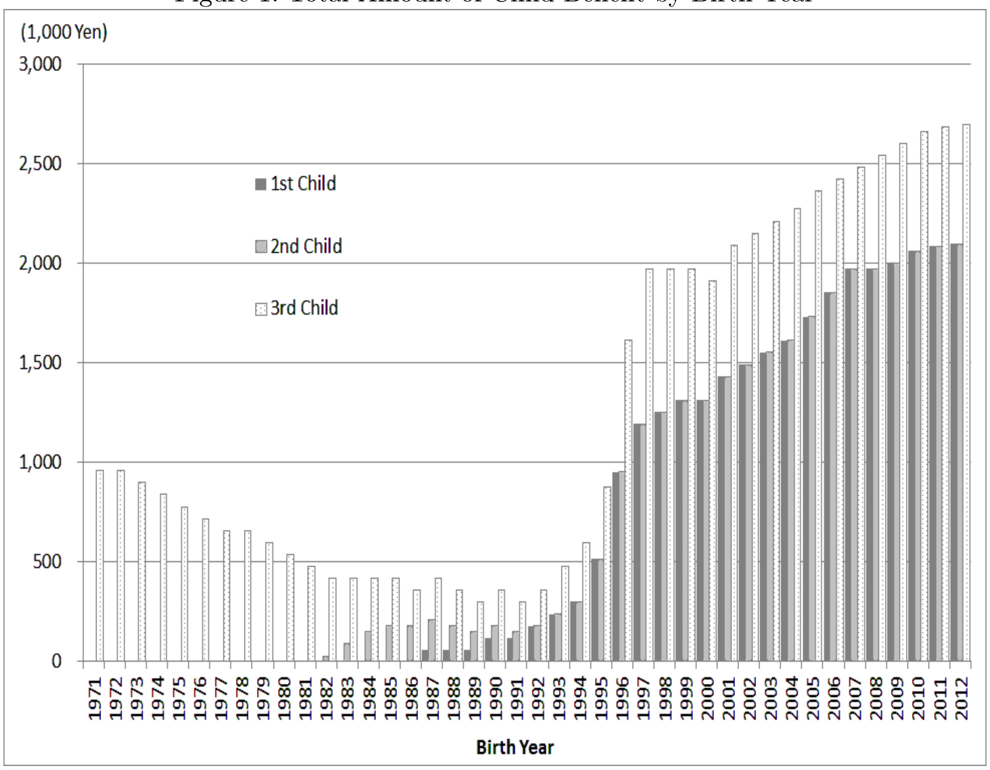
[a] This Table reports estimates based on specification in Table 4. The dependent variable is the total financial asset holding in the category shown at the top of each column. All specifications use the sample where the age of the oldest child is thirteen. are limited to the Standard errors robust to heteroskedascity. All columns report Seemingly Unrelated Regression results. *, ** , and *** represent significance at the 10 percent, 5 percent, and 1 percent levels, respectively. All columns use 22,543 observations.

Table 7: The Impact of Child Benefits on Financial Assets by Income Level[a]

	(1)	(2)	(3)	(4)
	Above Median	Below Median	Above 25p	Below 25p
Child Benefits Received to Date	1.06**	-0.30	0.74**	-0.29
	(0.43)	(0.26)	(0.33)	(0.33)
Expected Future Child Benefits	-0.13	-0.57***	-0.47**	-0.57**
	(0.26)	(0.18)	(0.21)	(0.26)
P-Value Test Difference Equals 1	0.72	0.03**	0.60	0.10*
N	11,269	11,274	16,905	5,638

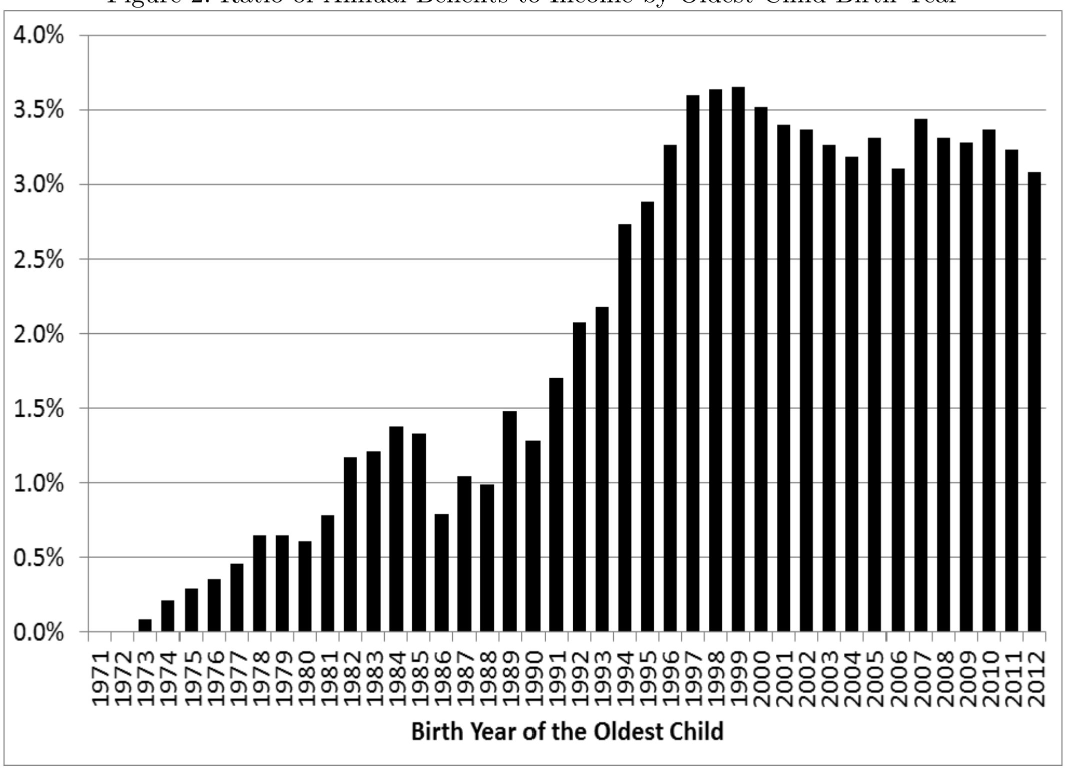
[a]This Table reports estimates based on equation (8) using the level of financial assets as the outcome. All columns report OLS regression results and include survey year indicators, survey month indicators, a home ownership indicator, and indicators for the age of the household hold. In addition, each column includes separate number of children of variables for each age from 0 to the maximum age of the oldest child. All specifications use the sample where the age of the oldest child is thirteen. Standard errors are robust to heteroskedascity. *, ** , and *** represent significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Figure 1: Total Amount of Child Benefit by Birth Year



* The amount of benefits are calculated by applying the law at each point of time to age(s) of child(ren). We assume there is no law change after 2013.

Figure 2: Ratio of Annual Benefits to Income by Oldest Child Birth Year



* The ratio is calculated by dividing imputed annual benefits by yearly income reported by households.