Do Consumers React to Anticipated Income Changes?

Evidence from the Alaska Permanent Fund*

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This paper exploits a natural experiment provided by regular annual payments from the State of Alaska's Permanent Fund to test whether households in Alaska smooth predictable income changes. Using variation in the amount of these payments across different years and in the amount received by families of different sizes, I find no evidence that consumption responds to these anticipated income changes. However, I find that the same families *do* overreact to their income tax refunds. These findings suggest that anticipated income changes have to be large and predictable for them to be incorporated in the household's chosen consumption path. (JEL D91, E21, E62, H31)

A central implication of the life-cycle/permanent-income hypothesis (LC/PIH) is that consumers should not respond to predictable changes in their income.[1] To test this hypothesis, a number of recent papers have exploited natural experiments to identify anticipated income changes.[2] In particular, recent work by Parker (1999) uses the change in after-tax income due to the cap on earnings subject to the social security tax, and a related paper by Souleles (1999) examines the response of consumption to income tax refunds. Surprisingly, Parker and Souleles find that even when income is expected to change within the year, expenditure is excessively sensitive to the timing of the income change. While their results can be interpreted as evidence that our canonical model of consumption is inadequate, an alternative explanation is that the anticipated income changes they exploit are small and irregular, and that households will not

bother to change their consumption paths when the computational costs involved are large relative to the utility gains. In support of this interpretation, Browning and Collado (2001) find that that the seasonal consumption patterns of Spanish households that work in sectors that provide regular bonus payments does not differ from that of households that do not receive bonus payments.

This paper adds to this evidence by exploiting a natural experiment provided by annual payments from the State of Alaska's Permanent Fund to every resident in the state of Alaska that should yield an unusually powerful test of the LC/PIH. These payments are large and clearly anticipated by Alaskan residents.[3] Using the variation in the size of the payments over time and in the amount received by families of different sizes to identify the response of consumption to payments from the Permanent Fund, I find no evidence that the consumption of Alaskan households reacts to these payments. In addition, I find no evidence that the seasonal pattern of consumption in Alaska differs from that in the other 49 states or that households in Alaska are subject to fewer liquidity constraints, engage in less buffer-stock saving, or spend a smaller fraction of their income on semi-durable goods than households in the rest of the US. However, although households in Alaska do not overreact to payments from the Permanent Fund, I find that the consumption of the very same households is excessively sensitive to their income tax refunds. This evidence suggest that households will take anticipated income changes into account in their consumption decisions when the income changes are large, regular, and easy to predict, but will not do so when they are small and irregular.

The paper proceeds as follows. The next section of the paper presents details on the operation of the Alaska Permanent Fund and discusses the relative advantages of using the payments from the Permanent Fund to test the LC/PIH. Section II contains a brief description of

the data. Section III presents the main excess sensitivity tests. Section IV discusses alternative explanations for the finding that households in Alaska appear to smooth their payments from the Alaska Permanent Fund and section V concludes.

I. The Alaska Permanent Fund

The Alaska Permanent Fund was created in 1976 when voters in Alaska passed an amendment to the State Constitution that deposited 25 percent of the State Government's oil royalties into this trust fund. Starting in 1982, approximately half of the annual dividend income from the Permanent Fund has been distributed to Alaskan residents every year.[4] The size of these annual dividend payments has varied from a low of $331 in 1984 to a high of $1,964 in 2000, depending primarily on the State Government's oil revenues and the performance of the Permanent Fund's investment managers. Everyone who has lived in Alaska for at least 12 months is eligible for these payments and has to file an application by the end of March every year to receive them.[5] Every person who qualifies for these payments receives the same amount, regardless of their income or age. In the first two years of the program (1982 and 1983), the dividend payments were distributed at different times of the year but starting in 1984, all the dividend checks were distributed in the last quarter of the year. After a direct deposit system was set up in 1994, all the payments have been made in early October.

There are several reasons why the Alaska Permanent Fund payments provide an ideal case study to examine the central implication of the LC/PIH. First, these payments are relatively large and arguably exogenous to the households that receive them. In 1998, for example, a family of four received $6,164 from the Permanent Fund. Second, they are clearly anticipated

since each resident has to file an application by the end of March each year to qualify for these payments, which is approximately six months before the funds are distributed in early October. Third, although a final public announcement on the size of the annual payment is made in late September, the formula used to calculate the amount to be disbursed is widely known. Based on this formula and on the monthly public reports of the Permanent Fund's earnings, newspapers in Alaska publish estimates of each year's payment before the amount is officially announced in September. Finally, the institutional features of the Permanent Fund allow me to construct a precise measure of the amount and the timing of the anticipated income change. First, I know the precise amount of the annual dividend payments and thus do not have to rely on other sources of income data to construct a measure of anticipated income change. Second, I know that after 1984, every household in Alaska received the dividend payments in the fourth quarter of the year.

II. Data

The empirical strategy is to use the Consumer Expenditure Survey (CEX) for the years 1980 to 2001 to examine whether the consumption of Alaskan residents increases when they receive their annual payments from the Alaska Permanent Fund.[6] The CEX collects detailed consumption expenditure information for each household from four interviews conducted every three months. In the first and final interviews, the survey also collects additional data on the household's demographic, income, and asset information. I extract and merge the data from the family and detailed expenditure files to create one observation for each household covering January 1980 to March 2001.

To improve the reliability of the estimates, I make the following cuts. I drop any family that lived in student housing. Households that do not have information on family size or the age of the head of the household are also dropped. Households are also dropped if they lacked food-expenditure data for any month. In addition, since the Alaska permanent fund payments were made throughout the year in 1982 and 1983, I drop the families interviewed in these two years. Lastly, to ascertain that the analysis is focused on Alaskan residents who received the dividend payments, I drop any family that reported having moved in the previous 6 months.

The CEX interviews about eighty households in Anchorage every year, but after the various cuts are made, I end up with a sample of roughly 800 households from 1980 to 1981 and from 1984 to 2001.[7] Table 1 presents some summary statistics on the Alaskan sample. The second column presents similar statistics for households in the other 49 states using a similar cut off criteria. The dividend fund income is calculated by multiplying the amount of the dividend payment each year by family size. Consumption is broken down into expenditure on durables, nondurables, and the main types of nondurable goods.[8] As can be seen, the Alaskan residents in the CEX are younger than households in the rest of the country. In addition, they have higher incomes and expenditures than households in the other 49 states, but half of this gap disappears once an adjustment is made for the higher cost of living in Alaska.[9]

III. Main Excess Sensitivity Tests

The main empirical test is to examine whether the seasonal pattern of consumption in the last two quarters of the year varies with differences in the size of the Permanent Fund payout across different households. Using the variance in the amount of these payments across time and

across families of different sizes to identify their effect on households in Alaska, I estimate the following specification of the linear Euler equation:

$$(1) \quad log\left(\frac{C_h^{IV}}{C_h^{III}}\right) = \alpha_1 \frac{PFD_t \; x \, Family \; Size_h}{Family \; Income_h} + z_h' \alpha_2 .$$

where h indexes households, PFD_t is the size of the permanent fund payout (per person) in year t, family income is the household's average quarterly income, and z contains variables for changes in the number of adults, number of children, and a second-order polynomial in age of the head of the household to capture the fact that household consumption is generally not flat over the life-cycle. The amount of the payment received by each household is calculated as the product of PFD and family size. The main independent variable is the percentage increase in a household's income in the fourth quarter due to payments from the permanent fund, and the key parameter of interest is α_1 which measures the elasticity of consumption to household income. The dependent variable is the change in household consumption (in logs) from the third quarter to the fourth quarter of the year. As previously mentioned, Alaskan residents received their dividend payments in the fourth quarter of the year. Under the certainty-equivalent version of the LC/PIH (or a version of the LC/PIH in which the expected variance of consumption is constant), α_1 should be equal to zero.

The first column in Table 2 presents the results of the first set of excess sensitivity tests for nondurable consumption.[10] The point estimate of α_1 is positive, but economically and statistically insignificant; it indicates that a ten percent increase in household income increases consumption by 0.002 percent. Since the dividend payments increased the quarterly income of

the typical household in my sample by slightly more than 20 percent (see Table 1), the point estimate of the elasticity of nondurable consumption suggests that the Permanent Fund payments increased household consumption by 0.004 percent (roughly 4 *cents*) in the fourth quarter of the year.

The estimate in the basic specification in the first column is identified both by differences in the size of the payment across time and across families of different sizes. The second column in Table 2 controls for year effects and thus identifies the effect of the permanent fund only from the cross-sectional variation in family size. Although one should interpret these estimates with caution since there are clearly reasons to expect the seasonal pattern of consumption to differ between families of different sizes, the point estimate of the elasticity of consumption is still essentially zero. The specification in the third column controls for family size and thus only uses the variation across time in the amount of the payment to identify the consumption effects of the dividend payments. Once again, one should be cautious in interpreting these numbers, since the seasonal pattern of consumption may have changed over time. Nonetheless, the point estimate of the income elasticity of consumption is still economically and statistically insignificant.

The last three columns in Table 2 present estimates of the response of expenditures on durables to the Permanent Fund payments using the three excess sensitivity tests. The coefficient estimates are small but marginally significant. Surprisingly, the point estimates indicate that the change in expenditures on durables is *smaller* when the Permanent Fund payments are higher, which suggests that households purchase durables in the third quarter *before* the dividend payments are disbursed in October.

In sum, the estimates in Table 2 suggest that households either save their dividend income or use it to pay down debt. To corroborate this evidence, one would ideally also like to observe the

debt and asset holdings of a family before and during the month of October.[11] It is not possible to do this with the CEX since this survey does not collect asset and debt information in every interview (it only collects this information in the first and fourth interviews). However, since the survey starting dates of a household are random throughout the year, this information can be used to construct estimates of the consumer debt and the balances in the savings and checking account of a *representative* Alaskan household in September and October.[12] As can be seen in figure 1, compared to a representative Alaskan family in September, a representative family in October had less consumer debt ($680) and higher balances in its savings and checking accounts ($440 and $640, respectively). In sum, the net assets of a typical family in the sample increased by $1,760 in October, which is slightly less than the amount an average family received from the Permanent Fund ($2,000; see Table 1).

As previously mentioned, the estimates shown in Tables 3 are identified using differences in the seasonal pattern of consumption across time and across families of different sizes. It is possible that households do respond to the payments from the Permanent Fund, but the effect is masked by pre-existing differences in the seasonal pattern of consumption across families of different sizes, or by changes in the seasonal pattern of consumption across time. The ideal way to address this possibility is to use households in other states whose seasonal pattern of consumption is similar to that of Alaskan households (in the absence of the permanent fund payments) as a control group. I do not have an ideal control group, but as partial suggestive evidence, I turn to graphical evidence on the seasonal pattern of consumption in Alaska compared with other households in the other 49 states.[13] Figure 2 presents kernel density estimates of the quarterly change in non-durable consumption in Alaska and in the rest of the US. As can be seen, there is no clear evidence that the distribution of the seasonal pattern of

consumption in Alaska is significantly different from that of other families in the US. In addition, although the quarterly change in consumption is larger for bigger families, there is no evidence that this difference is larger in Alaska than in the other 49 states. Furthermore, there is no clear evidence of a positive correlation between the change in consumption (or of the change in Alaska relative to the rest of the US) and the size of the dividend payment.[14]

Finally, in addition to testing whether households respond to anticipated increases in income, I can also examine whether the anticipated *fall* in income between the fourth quarter of the year and the first quarter in the next year due to the Permanent Fund led to a similar decline in quarterly consumption. The main independent variable in this case is $-\frac{PFD_t \; x \, Family\ Size_h}{Family\ Income_h}$, which is the anticipated decline in income due to the Permanent Fund between the fourth quarter and the first quarter of the following year. These estimates, shown in Table 3, are once again small and statistically insignificant, and thus add to the evidence that the consumption of Alaskan households are not excessively sensitively to payments from the Permanent Fund.

IV. Why do Alaskans Smooth Payments from the Permanent Fund?

This section turns to three explanations for why the evidence presented so far seemingly contradict the large body of evidence that consumption is excessively sensitive to anticipated income.

The first explanation is based on the idea that some types of nondurable consumption are less sensitive to current income than others. In particular, it's reasonable to expect that while the utility loss from postponing food consumption is very high, there is probably little utility loss from shifting expenditures on items such as entertainment and personal care and apparel and

clothing. Thus, if Alaskans spend more on food than on other items, this could possibly explain why their aggregate expenditures on nondurables does not react to payments from the Permanent Fund. However, Table 1 indicates that Alaskan households spend the same fraction of their nondurable expenditures on food (37 percent) as households in the other 49 states (39 percent).

As additional evidence that this composition effect is not driving the main findings of this paper, Table 4 presents the estimates of excess sensitivity for the three largest components of nondurable consumption: food and alcohol, entertainment and services, and apparel. These estimates generally indicate that the Permanent Fund payments have an insignificant effect on food consumption.[15] The effect on expenditures on entertainment are larger than on food expenditures, but the point estimate of the income elasticity of consumption is still significantly smaller than that found in other studies.[16] In sum, although the response of expenditures on entertainment is slightly larger, there is generally little difference in the degree of smoothing across subcategories of consumption.

A second explanation is that families in Alaska are less liquidity constrained or engage in less buffer stock saving than other families. There are, however, two pieces of evidence that do not support this explanation. First, the average household head in the sample of Alaskan households is seven years younger than household heads in the rest of the US (see Table 1). Since there is some evidence that consumption tracks income more closely for young households, this would seem to suggest that the average household in Alaska should be engaged in *more* buffer stock saving than other households.[17] A second method to evaluate the importance of liquidity constraints and buffer stock saving is to use current income as a proxy for being liquidity constrained or having few assets.[18] Table 5 presents the results of the excess sensitivity tests for households with incomes lower than the mean income in my sample of

Alaskan households. As can be seen, these estimates are slightly larger than those based on the entire sample (Table 2), but are still small and insignificant.

A third explanation is that consumers do in fact behave in the way predicted by the canonical model of intertemporal consumption behavior, but that the annual payments from the Alaska Permanent Fund is simply a better measure of predictable income than that used by other studies. There are two reasons why this might be the case. First, these payments are large, and thus the utility gain from smoothing are much larger than the gain from smoothing the income changes considered by many other studies. Second, the formula used by the State of Alaska to calculate the amount of the annual payment is widely known and publicized. The investment performance of the Permanent Fund is publicly announced every month and widely reported in newspapers in Alaska. Based on this information, numerous articles provide estimates of the size of the dividend payments before they are officially announced in September. For example, a headline on the front page of the Anchorage Daily News on March 1, 1996 read as follows: "Permanent Fund Soars When Bulls are Running; Stock Sales, Market Roll May Boost Alaskans' Checks." Later in the year (July 30, 1996), another front-page article in the same newspaper had the following headline: "Permanent Fund Profits Set Record: '96 Dividend Could Reach $1,100 Mark." In fact, the amount of the dividend payment that year was $1,131.

One way to test this explanation is to examine whether households are "excessively sensitive" to other types of anticipated income changes that are smaller and possibly harder to predict. For example, I can examine whether households in Alaska react differently to their income tax refunds than to their payments from the Permanent Fund. To do this, I restrict the sample to the households for which I have data on their income tax refunds. With this restricted sample, I adopt Souleles' (1999) test and examine whether household consumption in the second

quarter of the year is excessively sensitive to the income tax refunds. The first column in Table 7 presents the estimate of the elasticity of nondurable consumption in the second quarter to the income refunds. This estimate is positive and statistically significant. The point estimate indicates that an income tax refund that increases household income by 10 percent increases nondurable consumption by 3 percent. This is consistent with Souleles' (1999) finding that household consumption in the US is excessively sensitive to their income tax refunds.

I then examine whether the same households that overreact to their income tax refunds also respond to their payments from the Alaska Permanent Fund in the same way. These estimates, shown in the second column in Table 7, are small, statistically insignificant from zero, and roughly the same as the estimates presented earlier (in Table 2). These results show that the same families who overreact to their income tax refunds appear to smooth their payments from Alaska Permanent Fund, which suggests that the paper's finding of consumption smoothing is largely due to the nature of the income change considered in the paper.

Finally, it's worth mentioning that the two empirical studies that have not found evidence of excess sensitivity to anticipated income also exploit anticipated income changes that are large and easy to calculate. First, Paxson (1992) finds that the seasonal pattern of consumption of rice farmers in Thailand does not depend on the seasonal pattern of their income. Similarly, Browning and Collado (2001) find that the seasonal consumption patterns of Spanish households that work in sectors that provide regular bonus payments does not differ from that of households that do not receive bonus payments. The evidence provided by the payments from the Alaska Permanent Fund thus reinforces the message from Paxson's and Browning and Collado's work that families behave in the manner predicted by the LC/PIH when the cost of calculating the

anticipated income change is relatively low and the utility gain from smoothing consumption is relatively large.

V. Conclusion

This paper tests the LC/PIH by examining whether the consumption of households in Alaska changes when they receive large anticipated payments from the State of Alaska's Permanent Fund. Since these payments are large and regular, this test of the LC/PIH should have considerable power. In contrast to many other papers, I find evidence that households in Alaska smooth their dividend payments in a manner consistent with the LC/PIH. In addition, I find that the same households appear to be excessively sensitive to their income tax refunds. These two pieces of evidence suggest that bounded rationality, rather than the lack of desire to smooth the marginal utility of consumption, is the source of rejections of the LC/PIH. For households to incorporate anticipated income changes into their chosen consumption paths, these income changes must be large and transparent, and the costs associated with the mental processing of these forecastable income changes must be small relative to the utility gains from consumption smoothing.

This also implies that the answer to the question many people are concerned about -- the effect of fiscal policy on aggregate consumption and demand -- depends on whether the policy change is transparent and has a significant effect on the income of a typical household. Although this paper finds support for the LC/PIH, many tax and fiscal policy measures will probably have an effect on aggregate consumption as long as people find it difficult and costly to understand precisely how their incomes are affected by these policies.

Data Appendix

I used the CEX family and detailed expenditure files for the years 1980 through the first quarter of 2001 at the BLS' facilities in Washington, DC. As mentioned in the text, households are dropped if they are missing food expenditures for any month, or if the information on family size and number of children is missing, or if the age of the household head is missing, or if they have moved in the previous six months, or if they were interviewed in 1982 or 1983. All nominal variables were converted to real 1982-1984 dollars.

The consumption data is compiled from the detailed expenditure data. I estimate average monthly expenditures for different consumption categories for the third quarter of the year and the fourth quarter of the year. The definition of nondurable consumption and its three main components follows Parker's (1999) classification. Nondurable consumption is defined as the sum of expenditures on the following items: food, excluding food as pay and school meals; house-furnishings and equipment, excluding furniture, major appliances, and floor coverings; apparel and services; transportation excluding new and used vehicle spending and financing; entertainment; personal care; reading; and tobacco and smoking. Durable consumption is the sum of expenditures on new and used vehicles, furniture, major appliances, and floor-coverings. It excludes expenditures on mortgages, health care, pensions, education, and cash contributions. Food expenditure is defined as all expenditures on food and alcohol less food as pay and school meals. Apparel and services is defined in the same way as in the CEX. Entertainment and personal care is the sum of expenditures on entertainment, personal care, reading, tobacco, and smoking.

The family's payments from the Alaska Permanent Fund is computed by multiplying the number of members in the household by the amount paid by the dividend fund for that year. The measure for the number of members in the household is taken from the first interview. The denominator in the permanent fund variable is the family's pre-tax income from the CEX.

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[1] I refer to the certainty-equivalent version of the LC/PIH, or one in which the expected variance of consumption is constant. As is well known, without these assumptions, the LC/PIH only implies smoothing of marginal utility, not necessarily of consumption.

[2] See Martin Browning and M. Dolores Collado (2001), Jonathan A. Parker (1999), Christina H. Paxson (1992), John Shea (1995), Nicholas S. Souleles (1999). Also see Ronald A. Bodkin (1959) for an early example of the use of a natural experiment to test for excess sensitivity. For comprehensive reviews of the large literature on empirical tests of the LC/PIH, see Angus Deaton (1992), Browning and Annamaria Lusardi (1996), and Browning and Thomas Crossley (2001).

[3] In 1998 for example, the Permanent Fund paid $1,541 to every resident of the State of Alaska.

[4] Specifically, the amount distributed each year was 10.5 percent of the Permanent Fund's dividend income over the previous five years.

[5] The application deadline was on June 30 from 1983 to 1993 and the residency requirement was six months from 1982 to 1989. People convicted of felonies in the previous year and foreign nationals who are not US permanent residents do not qualify for the Permanent Fund payments. Infants also qualify as long as they were born in the previous calendar year. People who move out of Alaska after the March filing deadline are eligible for the payments as long as they can prove that they had intended to remain in Alaska at the time they filed the application.

[6] The BLS generously provided access to the non-public release version of the CEX for this study since the state identifiers for residents in Alaska (as well as that of many small states) are deleted in the version of the CEX that is publicly available. The only other difference between the version of the CEX used in this paper and the version that is publicly available is that the expenditure and income data are not top-coded as they are in the publicly available version.

[7] Since the CEX "recycled" its family identification numbers in 1986, households can not be matched between 1985 and 1986. Because of this, I do not have any usable observations from 1985.

[8] Gifts given to someone outside the household are excluded from the consumption measures. See the data appendix for details on the definition of the different consumption categories.

[9] Data collected by the American Chamber of Commerce indicates that the cost of living in Anchorage is 23 percent higher than in the rest of the country (Alaska Economic Trends, June 2000, Table 9, available at http://www.labor.state.ak.us/research/col/col.pdf).

[10] All the regressions also include a constant. I do not use the CEX's sampling weights, although the results are virtually identical if the weights are used.

[11] Remember that the payments are disbursed in early October.

[12] I thank a referee for this suggestion. In the first and fourth interviews, the CEX asks for information on the amount owned to creditors (UCC 6001 and 6002) and balances on savings and checking accounts in the previous month. Therefore, the data for September are from households whose first or fourth interviews was in October and the data for October are from households whose first or fourth interview was in November. The sample is restricted to observations after 1984 (inclusive).

[13] I thank a referee for this suggestion.

[14] Figures supporting these last two statements are available from the author.

[15] Parker (1999) also finds that food expenditures do not respond to anticipated income changes, but Shea (1995) and Souleles (1999) find some evidence that food consumption tracks predictable income.

[16] Parker (1999) estimates an income elasticity of 2.1 for expenditures on apparel and 0.8 for expenditures on entertainment.

[17] Gourinchas and Parker (2002) show that the consumption behavior of US households with household heads younger than 43 is dominated by buffer-stock saving considerations.

[18] As evidence that liquidity constraints might explain why consumption is excessively sensitively to income shocks, Souleles (1999) shows that wealthy households smooth their income tax refunds to a greater extent than less wealthy families.

Table 1. Sample Statistics

	Alaska		Other 49 States	
	Mean	Standard Deviation	Mean	Standard Deviation
Monthly Consumption (July-September)				
Non-Durable Consumption	1,107	(998)	792	(656)
Food and Alcohol	412	(221)	310	(211)
Apparel and Services	109	(139)	83	(119)
Entertainment and Personal Care	161	(744)	83	(358)
Durable Consumption	713	(1,178)	528	(1,097)
Monthly Consumption (October-December)				
Non-Durable Consumption	1,109	(646)	802	(601)
Food and Alcohol	396	(210)	296	(197)
Apparel and Services	140	(186)	103	(147)

Entertainment and Personal Care	142	(208)	83	(236)
Durable Consumption	643	(962)	512	(996)
Family Size	2.7	(1.5)	2.6	(1.5)
Age	42.1	(13.3)	48.9	(17.6)
Pre-tax Family Income (monthly)	2,898	(2,341)	2,068	(2,169)
Alaska Dividend Fund Income (per family)	2,048	(1,310)		
N	806		56,801	

Note: All nominal values were converted to 1982-1984 dollars. Alaska dividend fund income is for observations from 1984-2000.

Table 2.

Response of Consumption to Alaska PFD

	dlog(Nondurable Consumption)			*dlog(Durable Consumption)*		
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
$\frac{PFD_t \times Family\ Size_h}{Family\ Income_h}$	0.0002	–0.0167	–0.0034	–0.1659	–0.1741	–0.1488
	(0.0324)	(0.0336)	(0.0328)	(0.0878)	(0.0916)	(0.0890)
Controls for:						
Family Size	No	No	Yes	No	No	Yes
Year dummies	No	Yes	No	No	Yes	No
N	806	806	806	806	806	806

Notes: Dependent Variable is $\log(C_{IV}/C_{III})$. Standard errors in parentheses. All regressions are OLS and include a quadratic in age and changes in the number of children and adults in the household.

Table 3.

Response of Consumption to Anticipated *Fall* in Income

	dlog(Nondurable Consumption)		
	(1)	*(2)*	*(3)*
$-\frac{PFD_t \; x \, Family \; Size_h}{Family \;\; Income_h}$	0.0318	–0.0134	–0.0157
	(0.0376)	(0.0370)	(0.0378)
Controls for:			
Family Size	No	No	Yes
Year dummies	No	Yes	No
N	857	857	857

Notes: Dependent Variable is $\log(C_I/C_{IV})$. Standard errors in parentheses. All regressions are OLS and include a quadratic in age, and changes in the number of children and adults in the household.

Table 4.

Response of Food, Entertainment, and Apparel Expenditures to Alaska PFD

	Food			*Entertainment*			*Apparel*		
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
$\frac{PFD_t \; x \; Family \; Size_h}{Family \; \; Income_h}$	0.0037	0.0002	0.0049	0.0594	0.0674	0.0248	–0.0090	–0.0184	0.0097
	(0.0297)	(0.0298)	(0.0303)	(0.0758)	(0.0783)	(0.0762)	(0.1004)	(0.1043)	(0.1014)
Controls for:									
Family Size	No	No	Yes	No	No	Yes	No	No	Yes
Year dummies	No	Yes	No	No	Yes	No	No	Yes	No
N	806	806	806	777	777	777	704	704	704

Notes: Dependent Variable is $\log(C_{IV}/C_{III})$. Standard errors in parentheses. All regressions are OLS and include a quadratic in age and changes in the number of children and adults in the household.

Table 5.

Response of Consumption to PFD for Households Below Mean Wage

	dlog(Nondurable Consumption)		
	(1)	*(2)*	*(3)*
$\frac{PFD_t \; x \; Family \; Size_h}{Family \; Income_h}$	0.0227	0.0206	0.0154
	(0.0325)	(0.0339)	(0.0336)
Controls for:			
Family Size	No	No	Yes
Year dummies	No	Yes	No
N	455	455	455

Notes: Dependent Variable is $\log(C_{IV}/C_{III})$. Standard errors in parentheses. All regressions are OLS and include a quadratic in age and changes in the number of children and adults in the household.

Table 6:

Response of Nondurable Consumption to Income Tax Refunds and PFD

	dlog(Nondurable Consumption)	
	log(C_{II}/C_I)	*log(C_{IV}/C_{III})*
$\frac{PFD_t \times Family\ Size_h}{Family\ Income_h}$	--	0.0032
		(0.0562)
$\frac{Income\ tax\ refund_h}{Family\ Income_h}$	0.2831	--
	(0.1140)	
N	369	369

Notes: Dependent Variable is $\log(C_{II}/C_I)$ in column 1 and $\log(C_{IV}/C_{III})$ in column 2. Standard errors in parentheses. All regressions are OLS and include a quadratic in age and changes in the number of children and adults in the household.

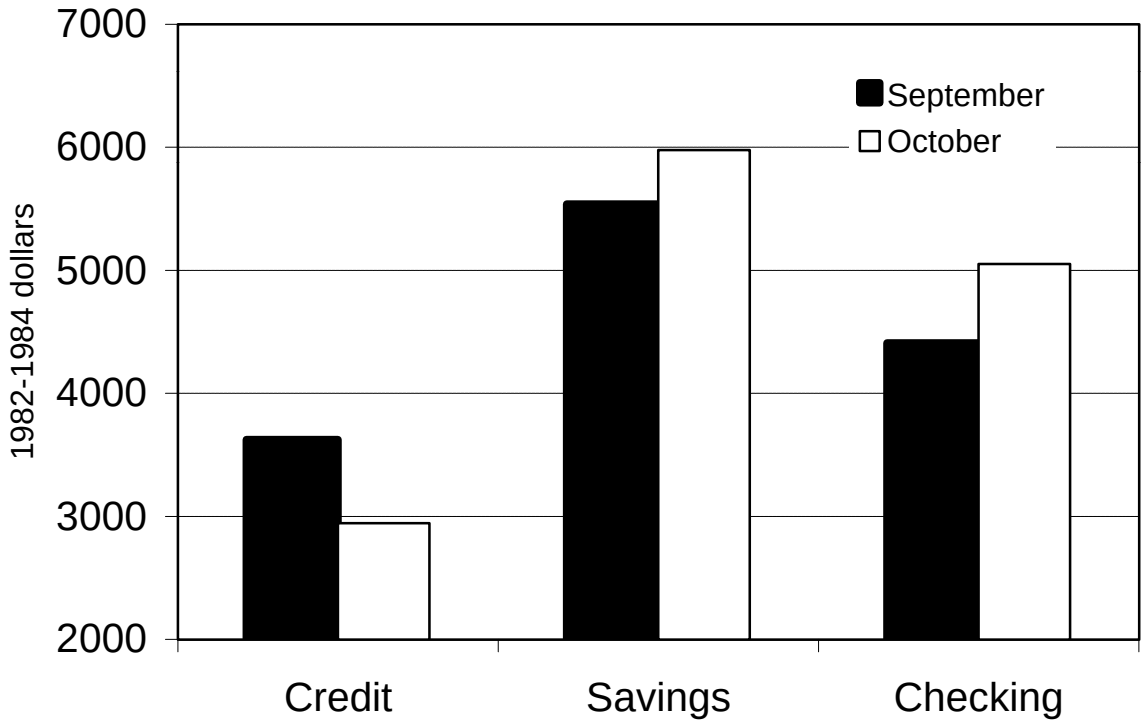


Figure 1.
Average consumer debt and balances in savings and checking accounts (Alaska residents)

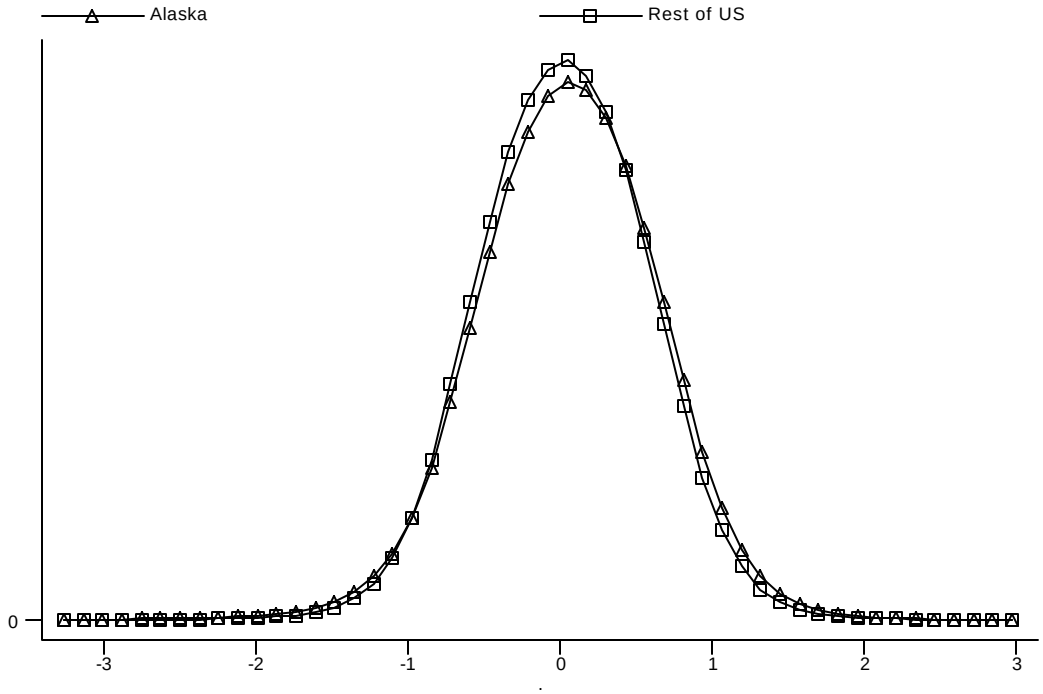


Figure 2: Distribution of log(Consumption q4/Consumption q3)

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