



Did Japan's shopping coupon program increase spending?[☆]

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ABSTRACT

In March 1999, 31 million “shopping coupons” worth 20,000 yen each were distributed to Japanese families with children and to the elderly. The coupons expired after six months and could only be used within the recipient’s local community. We use variation in the number of children across families and in the number of recipients across prefectures to measure the effect of the coupons on spending. We find that coupons had a positive effect on spending on semi-durables, but no effect on spending on nondurables or services. The marginal propensity to consume on semi-durables was 0.1–0.2 when the coupons were distributed in March. The results using regional variation provide stronger evidence that spending did not fall after the coupons had been redeemed.

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1. Introduction

In the spring of 1999 the Japanese government distributed shopping coupons worth 20,000 yen (about 200 dollars) to families with children under the age of 15 and to more than half of the elderly population. In total, 620 billion yen (about 6 billion dollars) worth of coupons were distributed to 31 million people. The coupons had to be spent in the recipient’s local community and expired within six months.

The Japanese government’s rationale for the “use-it-or-lose-it” nature of the coupons was that this unusual feature would stimulate more spending than a conventional tax cut. The shopping coupon program is widely viewed in Japan as having been modestly successful in stimulating spending. In 2009, 10 years later, Japan implemented a similar program, this time providing coupons worth 12,000 yen to every resident (regardless of age or income), with an additional 8000 yen for individuals under 18 or over 65. Other countries appear to have drawn similar conclusions from Japan’s earlier experience with shopping coupons. Taiwan, for example, distributed coupons worth about 120 dollars to every citizen in February 2009.

However, there are good reasons to believe that there is nothing particularly special about Japan’s coupon program. First, the fact that the coupons expired if not used would only have an effect on spending if households would have spent less than the amount of the coupons. And even in this case, households that spent more than they would have in the absence of the coupons may offset this spending by reducing spending in the future. Second, the fact that households had to spend the coupons in their local community is only a constraint if households would have spent less than the amount of the coupons in their community in the relevant time horizon. Therefore, there is no reason to believe that the effect of the coupons on spending would be any different from that of a tax cut. Accordingly, the evidence on the effect of the Japanese shopping coupon program on expenditure should add to the evidence on the effect of tax cuts, such as the 2001 and 2008 tax rebates in the US, and should provide guidance on the potential impact of tax cuts such as the cuts in the 2009 U.S. fiscal stimulus bill.¹

Our goal in this paper is to measure the effect of the 1999 shopping coupon program on spending. We use two features of the shopping coupons to do this. First, among the non-elderly population, the number of coupons received by a family was entirely determined by the number of children under the age of 15. Using this fact, we measure the effect of the coupons on spending

[☆] The views expressed in this paper are personal and do not necessarily represent those of the Cabinet Office or of the Japanese Government. A previous version was submitted to the University of Michigan as a chapter of Shimizutani’s Ph.D. dissertation.

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¹ For studies on the effect of tax cuts on spending, see Souleles (2002), Shapiro and Slemrod (1995,2003), Johnson et al. (2006), and Shimizutani (2006). See also Deaton (1992), Browning and Lusardi (1996), Browning and Collado (2001), Browning and Crossley (2001), Hsieh (2003), Stephens (2003) and Hori and Shimizutani (2009) for evidence on the effect of income changes on expenditure.

with household level data from Japan's *Family Income and Expenditure Survey* (FIES). We use this data to measure whether families with more children increased their spending when the coupons were distributed by more than families with a smaller number of children. We control for “normal” differences in the change in consumption between families with different numbers of children by using the seasonal patterns from 1990 through 1998 before the coupons were distributed.

Second, we use data on aggregate monthly retail sales in each prefecture from Japan's *Current Survey of Commerce* to measure whether retail sales increased by more in the spring of 1999 in prefectures where a larger share of households received the coupons. As in the household analysis, we control for “normal” differences in seasonal changes in sales in retail stores across prefectures using the seasonal changes in the years prior to 1999. Although we are limited to the variation across prefectures, a benefit of using prefectural-level sales data is that it captures the effect of the coupons on spending of the elderly population as well as that of families with children.

We find that the coupons had a positive effect on expenditures on semi-durables in the month the coupons were distributed, but little effect on spending on non-durables or services. Estimates using the household level data (that only measure coupons distributed to families with children) suggest that the marginal propensity to consume (MPC) on semi-durables was 0.1–0.2 when the coupons were distributed in March but zero in subsequent months. We find comparable estimates of the MPC when we measure aggregate retail sales in a prefecture: the MPC using aggregate retail sales is 0.11 in March and 0.14 in July. The results using regional variation provide stronger evidence that spending did not fall after the coupons had been redeemed.

The remainder of this paper is organized as follows. The next section briefly outlines the shopping coupon program, while Section 3 describes the data used in the analysis. Section 4 then turns to the estimation of the effect of the program, comparing families with different numbers of children, while Section 5 uses regional sales data to analyze the impact of the program across prefectures. Section 6 concludes.

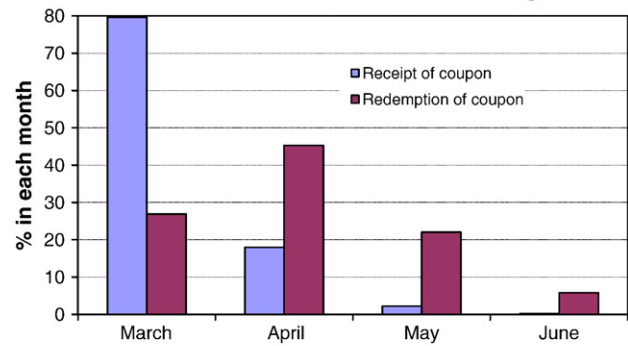
2. The “shopping coupon” program

In the spring of 1999, the Japanese government distributed shopping coupons worth 20,000 yen per eligible person to roughly 31 million people. The coupon program was proposed by the *Komeito* (one of the three parties in the coalition government) on October 6th, 1998, without specifying a precise amount or who would be eligible. According to the *Nikkei* newspaper, the *Komeito* reached an agreement with the Liberal Democratic Party, the leading party in the coalition, on the coupon program on November 9th, 1998.

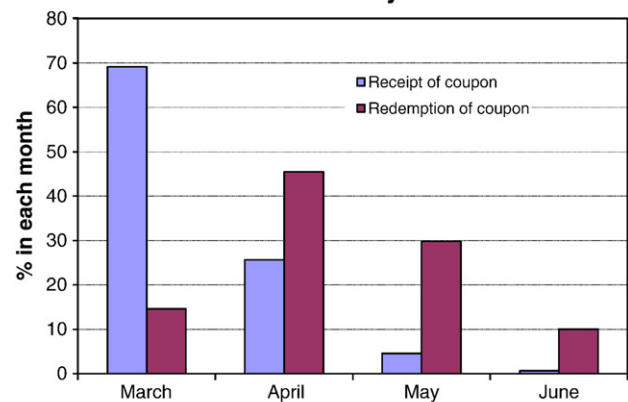
The final agreement between *Komeito* and the Liberal Democratic Party was that the coupons would be distributed to families with children and to the elderly. Specifically, families with children received a coupon for every child under the age of 15, without regard to the family's income. In contrast, coupons for the elderly were means tested, but 56% of the elderly over the age of 65 were estimated to qualify under the means-testing criteria used.² The Ministry of Home Affairs (the main administrator of the coupon program) estimates that 32 million people (roughly 25% of Japan's population) qualified for the coupons, of which 11.6 million were over the age of 65.

² Specifically, the elderly poor were defined as: 1) recipients of old-age welfare pensions, basic disability pensions, basic bereaved pensions, mother and baby pensions, bereaved child pensions, child family allowances, disabled child welfare allowances, welfare aid, or residents in social welfare institutions; or 2) over the age of 65 and having no tax liabilities in 1997 and 1998.

A: Households with Children under age 15



B: Households with Elderly Members



Source: Economic Planning Agency (1999)

Fig. 1. Timing of receipt and expenditure of coupon (EPA survey).

The shopping coupons were distributed by local governments. They had to be spent in the recipient's local community (city, town, or village). Local governments had the authority to allow the coupons to be spent outside the local community, and a small number of local governments in rural areas chose to do this (Ministry of Home Affairs (1998)). However, these exceptions are unlikely to affect the prefectural-level analysis since neighboring local communities are almost always in the same prefecture. The coupons were not transferable and change was not provided for purchases smaller than 1000 yen. The coupons could be spent on most consumption goods and services and expired in September 1999 if they had not been redeemed by then.³

The majority of local governments began to distribute the coupons in early March, 1999. The coupons were automatically distributed to families with children based on the data from household registration records maintained by Japanese local governments. The elderly, however, had to file an application with local governments to prove their eligibility. The administrative data provided by the Ministry of Home Affairs indicates that 31 million coupons had been distributed by the end of June 1999; 31 million is 97% of the 32 million people estimated to be eligible for the coupons. The administrative data also indicates that almost 40% of the coupons had been redeemed by April 20th, increasing to 79.5% by June 30th, 1999. By the time the coupons were set to expire (September 30, 1999), 99.6% of the outstanding coupons had already been spent.

A survey in July 1999 of 9000 coupon recipients provides additional information on when families received and spent the coupons (Economic Planning Agency (1999)). Fig. 1 presents the data from this survey. Panel A shows that 80% of households with children received their coupons in March and another 20% in April. Panel B shows that more than 90% of the eligible elderly population received

³ The coupons could not be used for lottery tickets, stamps, taxes, utilities, or debt payments.

their coupons by the end of April. Fig. 1 also shows that almost 30% of households with children redeemed the coupons by March, and 70% had done so by April.

In short, virtually all of the intended beneficiaries received and used the coupons, and most of the coupons were redeemed in March and April 1999.

3. Data

Our first source of data is the household level data from the *Family Income and Expenditure Survey* (FIES) from 1990 to 1999. The FIES provides detailed information on the demographic characteristics, income, and expenditures for a nationally representative sample of 8000 households each month.⁴ The monthly consumption data is compiled from a diary collected twice a month. Single-person households and households employed in the agriculture or fishery were not surveyed before July 1999. Each household is surveyed for six months before being replaced. Since one in six households is replaced each month, we can follow a panel of 1300 households over six months.

To improve the reliability of our estimates, we excluded the following households from our sample. First, we dropped households with self-employed household heads because we do not have monthly income information for these households. Second, we dropped households where the reported age of the household head changed by more than one year during the six-month period; where the household's tenancy status changed from owner to renter or vice-versa; or where there was a change in family size between successive months. Third, because the FIES does not allow us to reliably identify elderly people who received a coupon, we exclude all households with a person over the age of 65.⁵ Fourth, a household was excluded if the number of family members was greater than ten because the consumption patterns of large extended households are likely to be significantly different from those of smaller households that are the norm in Japan, though the number of the large households in the sample is very small. Fifth, we confined our sample to households that did not attrite before the sixth interview. Finally, we excluded a household if the change in consumption (in absolute value) between successive months exceeded the average consumption change in our sample by more than three standard deviations. After these adjustments, the size of each six month panel drops from 1300 to 600 households.

We focus on the five panels spanning March through July because most of the coupon recipients received and spent their coupons in March, April, or May of 1999. Specifically, these are the households we observe from October to March, November to April, December to May, January to June, and February to July in each year. We focus on total spending on nondurables and three categories of nondurables: semi-durables, strictly non-durables, and services, which are deflated by the corresponding Consumer Price Index (CPI) compiled by the Japanese government.⁶ The summary statistics are shown in Appendix Table 1. Our second data source is the *Current Survey of Commerce*, a monthly survey of wholesale and retail establishments.⁷ We use

aggregate monthly sales by large-scale retailers with 50 or more employees in each of the 47 prefectures in Japan from 1990 to 1999 from the published tabulation of this survey. Finally, we obtained the number of coupons distributed in each prefecture from the Ministry of Home Affairs. The summary statistics of this second dataset can be seen in Appendix Table 2.

4. Impact of coupons on the consumption of families with children

We begin by using the six-month panels from the FIES to estimate the impact of the shopping coupons on household consumption. Each family received one coupon for every child under the age of 15. The coupon program thus increased the income of families with a large number of children by more than that of families with a smaller number of children. This is the variation we exploit.

We estimate the following model on our main sample (the five overlapping panels from 1990 through 1999).

$$\log\left(\frac{C_{h,t}}{C_{h,february}}\right) = a_1 \cdot \left(\frac{20,000 \cdot Children_h \cdot I_{1999}}{Income_h}\right) + Z'_h \cdot a_2 + Year'_h \cdot a_3 + \varepsilon_{h,t} \quad (1)$$

Here, h indexes households and t indexes the month. $C_{h,t}$ is real monthly consumption of household h in month t . The dependent variable is the log of consumption in month t relative to consumption in February. The key independent variable is the ratio of the value of the coupons to the household's monthly income in the previous year ($Income_h$), where the value of the coupons is measured as the product of 20,000 yen, the number of children under the age of 15 ($Children_h$), and an indicator variable for observations in 1999 (I_{1999}). The other independent variables are a vector of controls at the household level denoted by Z_t (number of children under the age of 15, number of other family members, and a quadratic in the age of the household head) and indicator variables for year (denoted by $Year_h$).

For the household we observe in 1999, the variation in the key independent variable is driven by variation in the number of children relative to income. For households from 1990 to 1998, the value of the coupons is set to zero. Since we include controls for year and the number of children, the coefficient on $\frac{20,000 \cdot Children_h \cdot I_{1999}}{Income_h}$ measures whether families with a high children to income ratio increased their spending by more than families with a lower children to income ratio in the year the coupons were distributed (1999) relative to previous years (1990–1989).

Table 1 presents estimates of a_1 . Panel A presents the estimates using all five overlapping panels. Each column measures the change in consumption in each month starting in March relative to February. We note that the sample becomes smaller as we measure the response over additional months; we estimate the change in consumption in March from all five panels, but we drop households that are interviewed in October through March when we estimate the change in consumption in April. At the extreme, the change in consumption in July is based only on the February–July panel.

Table 1 provides little evidence that the coupons led to increased spending on non-durables or on services, nor does it provide evidence of an effect on total spending (first row).⁸ There is, however, evidence that the coupons did increase spending on semi-durables in March (when the coupons were initially distributed). The estimate indicates that a one percent increase in monthly income due to the coupons is associated with a marginally significant 1.3% increase in spending on semi-durables in March. The estimated effect of the coupons on

⁴ Hayashi (1986) is an earlier work using micro-level data from the FIES.

⁵ There is no explicit data on the amount of coupons a household received in the FIES micro-data.

⁶ Semi-durables include clothing, footwear, sporting goods, video games, computer hardware and software, and books. Strictly non-durables include food (except eating out), fuel, light, and water charges, medicines, films, plants and gardening goods, and tobacco. Services include eating out, rent for housing, medical expenses, public transportation, communication (except communication equipment), education (except school textbooks and reference books), recreational services and personal care services (Ministry of Internal Affairs and Communications (various years)).

⁷ We used the sales by large-scale retailers in the *Current Survey of Commerce*, which is a census of large-scale retail establishments with 50 or more employees. According to the June 1999 *Census of Commerce* (which covers all retail stores) conducted in June 1999, store with more than 50 employees accounted for 15.8% of total retail sales.

⁸ Since total spending is large and about eight times the size of semi-durables, much of a change in percentage terms in this category is not expected in response to a small amount of coupon.

Table 1
Did families with more children spend more than families with less children?
Independent variable: coupon income/annual income.

	Dependent variable: log Consumption in Each Month (relative to February)				
	March	April	May	June	July
<i>A: Overlapping panels</i>					
Total (except durables)	0.12 (0.15)	0.11 (0.17)	−0.05 (0.19)	−0.35 (0.24)	−0.24 (0.36)
N	25,422	20,555	15,700	10,850	5471
Semi-durables	1.29 (0.59)	1.13 (0.66)	−0.33 (0.74)	−0.57 (0.91)	−0.23 (1.36)
N	24,362	19,679	15,063	10,428	5232
Non-durables	0.19 (0.10)	0.01 (0.11)	−0.06 (0.13)	−0.21 (0.17)	0.12 (0.26)
N	25,583	20,663	15,780	10,887	5497
Services	−0.20 (0.29)	−0.01 (0.32)	−0.16 (0.36)	−0.14 (0.44)	−0.31 (0.67)
N	25,415	20,522	15,682	10,813	5457
<i>B: February–July panel</i>					
Total (except durables)	0.18 (0.35)	0.27 (0.35)	0.23 (0.32)	−0.11 (0.34)	−0.24 (0.36)
N	5466	5458	5460	5458	5471
Semi-Durables	2.53 (1.33)	3.13 (1.30)	1.62 (1.28)	0.10 (1.28)	−0.23 (1.36)
N	5232	5232	5232	5247	5232

Notes: Dependent variable is the log of consumption in a month starting in March relative to consumption in February. Estimates are coefficients on coupon/income. Other independent variables are a quadratic in the age of the household head, the number of children under the age of 15, the number of other family members, and indicator variables for year. The data in Panel A are the FIES panels from 1990 through 1999 covering October–March, November–April, December–May, January–June, and February–July. The data in Panel B are FIES panels from 1990 through 1999 covering February–July. The implied MPC for semi-durables (after correcting for attenuation bias) are 0.09 (0.04) in March and 0.06 (0.04) in April in panel A. For Panel B, the implied attenuation-corrected MPCs are 0.17 (0.09) in March and 0.18 (0.07) in April (standard errors in parentheses).

consumption in subsequent months are less precise because the samples get smaller, but there is generally little evidence that the coupons had a long lasting effect on spending. For example, a one percent increase in income due to the coupons is associated with a statistically insignificant 0.23% decline in July.

The estimated consumption response in March and April 1999 to the coupons is likely to be downward biased because not all the households received and spent their coupons during these months. We can use information on the percentage of coupons distributed in each month to adjust for this bias. For example, we know that 80% of households with children received their coupons in March and another 18% in April (Fig. 1, Panel A). The “attenuation-corrected” marginal propensity to consume (MPC) on semi-durables in March can be calculated as $a_1 \times (C/Y) \times (1/0.80) = 0.09$.⁹ Taking the point estimates of a_1 for subsequent months, we get an “attenuation-corrected” MPC of 0.06 for April, −0.02 for May, −0.03 for June, and −0.01 for July.

Panel B restricts the sample to the panel that we follow over all five months (February through July). The standard errors are now larger, but the point estimates in the first three columns are also larger. The estimates of a_1 imply an attenuation-corrected MPC for March of 0.17 (roughly twice as large as the MPC estimated from all five panels), 0.18 in April, and 0.09 in May.

These estimates based on the February–July panel suggest that the coupons might have had a positive effect on spending even after the coupons were spent (most of the coupons were redeemed in March and April). We now directly measure the total change in spending beginning in March. Table 2 shows the coefficient on coupon income

⁹ Appendix Table 1 indicates that semi-durable consumption/monthly income averages 5.5%, so $MPC = 1.29 \times 0.055 \times (1/0.80) = 0.09$. Souleles (1999) uses a similar method to adjust estimates of the MPC for attenuation bias.

Table 2
Did families with more children spend more in the long run? Independent variable:
coupon income/annual income.

	Dependent variable: log of Average Consumption Starting in March (relative to February)				
	March	March–April	March–May	March–June	March–July
Total (except durables)	0.18 (0.35)	0.27 (0.31)	0.35 (0.29)	0.23 (0.28)	0.09 (0.28)
N	5466	5465	5468	5461	5472
Semi-durables	2.53 (1.33)	2.71 (1.17)	2.47 (1.11)	1.90 (1.08)	1.49 (1.07)
N	5232	5296	5311	5313	5317
Non-durables	0.21 (0.23)	0.22 (0.19)	0.20 (0.19)	0.13 (0.19)	0.12 (0.19)
N	5480	5477	5478	5475	5485
Services	0.11 (0.65)	−0.19 (0.58)	0.02 (0.56)	0.26 (0.54)	−0.10 (0.53)
N	5457	5458	5464	5453	5459

Notes: Dependent variable is the log of average consumption starting in March relative to consumption in February. Estimates are coefficients on coupon/income. Other independent variables are a quadratic in the age of the household head, the number of children under the age of 15, the number of other family members, and indicator variables for year. The data are FIES panels from 1990 through 1999 covering February–July.

from Eq. (1) where we use the log of average monthly consumption between March and the corresponding month (relative to consumption in February) as the dependent variable. Here, there is evidence of a sizable response. For example, average spending on semi-durables in March through July increased by 1.49% for 1% increase in income. Since most of the coupons had already been spent by July, this implies the MPC on semi-durables over the five month period from March through July was 0.41.¹⁰ This estimate thus suggests that there was no reversal in spending in June and July after the coupons had been used.

We now probe the sensitivity of our estimates. First, the variation in coupon income we use in Tables 1 and 2 is driven by the variation in the number of children (under 15) relative to monthly income. Table 3 presents estimates where the key independent variable is now the product of an indicator variable for 1999 and the number of children under 15 but otherwise everything is the same as in Eq. (1). The variation is now entirely driven by the number of children and not by variation in (non-coupon) income. In Panel A, the estimated effect on spending on semi-durables in March and April are generally positive, but drops to zero in subsequent months. Those estimates show that for a family with one more child under the age of 15, consumption for that family is estimated to be four or five percent higher in the first two months. In Panel B, where we once again restrict the sample to the February–July panel, the effect on spending on semi-durables is positive in March, April, and May and drops to zero in June and July. Second, our identifying assumption is that the coupon program is the only shock in 1999 that had a differential effect on families with more or less children under the age of 15. However, it is possible that there were other shocks that also had a heterogeneous effect on families depending on the number of children. If this were the case, we would mistakenly attribute the heterogeneous response of consumption in 1999 to the coupons (Mariger and Shaw, 1993). We cannot completely rule out this possibility, but we can test whether the consumption of households with family members older than 15 changes by more than that of households with a smaller number of members older than 15. The idea is that household members older than 15 did not qualify for the coupons, so we would not expect to see a response if the coupon program was the only shock in 1999. This appears to be what we find. Specifically, when we include a variable for the hypothetical coupon income for household

¹⁰ MPC of total consumption over the five month period from March to July = $1.49 \times 0.055 \times 5 = 0.41$ (0.055 is the semi-durable consumption/income ratio and we multiply by 5 to account for the fact that the dependent variable is average monthly consumption).

Table 3

Did families with more children spend more than families with less children? Independent variable: # children < 15.

	Dependent variable: log Consumption (relative to February)				
	March	April	May	June	July
<i>A: Overlapping panels</i>					
Total (except durables)	0.01 (0.01)	0.003 (0.008)	−0.003 (0.009)	−0.02 (0.01)	0.01 (0.02)
N	25,422	20,555	15,700	10,850	5471
Semi-durables	0.05 (0.03)	0.04 (0.03)	−0.01 (0.03)	−0.03 (0.04)	0.01 (0.06)
N	24,362	19,679	15,063	10,428	5232
Non-durables	0.006 (0.005)	−0.0005 (0.005)	−0.01 (0.01)	−0.02 (0.01)	−0.001 (0.01)
N	25,583	20,663	15,780	10,887	5497
Services	0.01 (0.01)	−0.001 (0.02)	−0.01 (0.02)	−0.01 (0.02)	0.02 (0.03)
N	25,415	20,522	15,682	10,813	5457
<i>B: February–July panel</i>					
Total (except durables)	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)	−0.01 (0.02)	0.01 (0.02)
N	5466	5458	5460	5458	5471
Semi-durables	0.09 (0.06)	0.12 (0.06)	0.06 (0.06)	−0.001 (0.06)	0.01 (0.06)
N	5253	5230	5232	5247	5232

Notes: Dependent variable is the log of consumption in a month starting in March relative to consumption in February. Estimates are coefficients on product of number of children under age 15 and an indicator variable for 1999. Other independent variables are a quadratic in the age of the household head, number of children under the age of 15, the number of other family members, and indicator variables for year. The data in Panel A are the FIES panels from 1990 through 1999 covering October–March, November–April, December–May, January–June, and February–July. The data in Panel B are FIES panels from 1990 through 1999 covering February–July.

Table 4

Did the coupons have a larger effect in poor families? Independent variable: coupon income/annual income.

A: Assets/Income						
	>= mean	< mean	>= 1	< 1	>= 1/2	< 1/2
Semi-durables	2.11 (2.25)	2.73 (1.60)	1.38 (2.26)	3.10 (1.60)	1.60 (1.97)	3.45 (1.75)
N	1644	2981	1674	2.951	2610	2015
B: (Assets + Income)/Consumption						
	>= mean	< mean	>= 50	< 50	>= 80	< 80
Semi-durables	−0.51 (2.91)	2.85 (1.48)	−1.39 (4.91)	2.70 (1.37)	−6.36 (8.08)	2.88 (1.32)
N	1502	3123	739	3886	349	4276

Note: Dependent variable is log of spending on semi-durables in March relative to February. Entries are coefficients on Coupons/Income. Other independent variables are a quadratic in the age of the household head, the number of children under the age of 15, the number of other family members, and indicator variables for each year. Assets are defined as gross financial assets, income is average monthly income in previous year, and consumption is average consumption (over the six months). The sample is the matched panel of the FIES and FSS from 1990 to 1999. Standard errors in parentheses.

members older than 15 relative to the household's monthly income in the previous year in Eq. (1), the point estimates of the coefficient on the hypothetical coupon income are always zero.¹¹

Table 4 probes for evidence of heterogeneity in the response to the coupons across poor and rich families. We classify families into poor and rich using information on financial assets of individual households. The FIES does not collect information on assets, but the *Family Savings Survey* (henceforth, FSS) collects data on financial assets on December 31 in every year from the same households

¹¹ We introduced $\frac{20,000 \cdot \text{FamilyMembers}_{h,t} > 15 \cdot I_{1999}}{\text{Income}_h}$ as an additional independent variable in Eq. (1).

Table 5

Did larger families spend more when the coupon program was announced? Independent Variable: Coupon Income/Annual Income.

	Dependent variable: log Consumption (relative to October)			
	Nov.	Dec.	Jan.	Feb.
Semi-durables	0.08 (0.54)	−0.82 (0.56)	0.47 (0.69)	−0.74 (0.87)
N	27,159	21,872	14,603	9582

Note: Dependent variable is the log of consumption in a month starting in November relative to consumption in October. Entries are coefficients on Coupons/Income. Other independent variables are a quadratic in the age of the household head, the number of children under the age of 15, the number of other family members, and indicator variables for each year. The sample are FIES panels from 1990 through 1999 covering June–November, July–December, August–January, and September–February. Standard errors in parentheses.

surveyed in the FIES who entered the sample in August, September, or October. We can therefore create a matched data set from the FIES and the FSS to measure the impact of the coupons across families with different levels of financial assets. Since we need data covering the period before and after March, the only panel we can use is the October–March panel. We can thus only measure the effect of the coupons on spending in March.

Table 4 presents the estimated impact of the coupons on spending in March using two classifications of rich and poor. Panel A classifies families based on their asset–income ratios, and Panel B classifies families based on their asset–consumption ratios.¹² For each sample, we then estimated the response of consumption in March using the specification in Eq. (1). In every case, we find that the effect of coupon income on spending is always higher for households that have less assets relative to their income or to their consumption. However, the standard errors with these limited samples are such that we can generally not reject the null hypothesis of equal coefficients.

Finally, since the program was widely anticipated by the time the coupons were distributed in March, a forward-looking household may have already adjusted its spending even before the coupons were distributed in March. News reports indicate that the program was first proposed in early October 1998 with no information on the amount of the coupons or who was to qualify. The final agreement was announced and widely publicized in early November. Although an argument can be made that the program was already anticipated in October 1998, we think that November 1998 is a more plausible date for when the public was informed of the program. We will therefore measure the change in consumption starting in November when the program was announced, but before households began to receive the coupons in March 1999. The specification we estimate is the same as in Eq. (1), with the only difference being that the dependent variable is now the change in consumption relative to October. The results, presented in Table 5, provide no evidence that consumption responded to news of the coupon program: all the estimated coefficients are statistically insignificant.

In sum, the shopping coupons program appears to have had a positive effect on the consumption of semi-durables when the coupons were distributed. We find no evidence of a reversal in spending after the coupons were used. We also find a larger effect among families that were poor and more likely to be liquidity constrained.

¹² Specifically, we followed a referee's suggestion and used (assets + monthly income)/monthly consumption.

Table 6

Did retail sales increase in prefectures where more people received coupons?
Independent variable: coupons in Prefecture \times 20,000 yen/Prefecture GDP.

	Dependent variable: log retail sales (relative to February)				
	March	April	May	June	July
Retail sales	1.47 (0.98)	1.80 (0.98)	1.92 (1.14)	2.88 (1.11)	2.73 (1.32)
Clothing and apparel	1.99 (1.19)	1.43 (1.19)	0.49 (1.32)	4.10 (1.26)	1.44 (1.38)

Notes: The unit of observation is a prefecture (47 prefectures in total). The dependent variable is the log of the ratio of retail sale in a prefecture in a month starting in March to retail sales in February. Entries are coefficients on ratio of the product of the number of coupon recipients and 20,000 yen in the prefecture to average monthly regional GDP in the previous year (standard errors in parentheses). Regressions also include indicator variables for prefecture and year. The MPC corrected for the timing of coupons distribution is 0.10 (0.06) in March, 0.09 (0.05) in April, and 0.10 (0.06) in May (standard errors in parentheses).

5. Impact on spending across prefectures

This section examines whether consumption increased by more in prefectures where a larger share of the population received shopping coupons. The coupons could be used only within the recipient's local region (city, village, or town). Since prefectures with more children and elderly received more coupons, one way to measure the effect of the coupon program is to compare the change in consumption in a prefecture with a large number of children and elderly people (relative to the population in the prefecture) to a prefecture with fewer children and elderly. Since the seasonal pattern of consumption in a prefecture with a larger number of children and elderly people may differ from that in a prefecture with a smaller number of people eligible for the coupons, it is important to control for this "normal" seasonal pattern. We use the seasonal patterns of consumption across prefectures in previous years (1990–1998) to control for these "normal" seasonal expenditure changes.

Our dependent variable is the monthly retail sales in a prefecture.¹³ We combine the data on monthly retail sales in a prefecture with the administrative data on the total number of coupons distributed in each prefecture. The main advantage of this data is that we are now capturing the consumption response to the distribution of coupons to the elderly as well as to households with children. We work with two measures of retail sales: total retail sales and sales of apparel and clothing. We compile data from 1990 to 1999, so we have nine years of data to control for seasonal patterns of consumption across prefectures.

The basic specification we estimate is similar to Eq. (1):

$$\log\left(\frac{S_{i,t}}{S_{i,february}}\right) = b_1 \cdot \left(\frac{Coupon_{i,t}}{MonthlyIncome_{i,t}}\right) + Z_i' \cdot b_2 + Year_t' \cdot b_3 + \varepsilon_{i,t} \quad (2)$$

where i indexes prefectures (47 prefectures in total) and t refers to the year. $S_{i,t}$ is real monthly retail sales in prefecture i . Z_i represents a vector of indicator variables for each prefecture, and $Year_t$ is a vector of indicator variables for each year. The main dependent variable is now the log of retail sales in a prefecture in a month starting in March relative to retail sales in February, and the main independent variable is the total coupon income in a prefecture (computed as the total value of coupons distributed in a prefecture) relative to the average

aggregate monthly GDP in the prefecture in the previous year.¹⁴ For observations prior to 1999, $Coupon_{i,t}$ is set to zero. The coefficient on $\frac{Coupon_{i,t}}{MonthlyIncome_{i,t}}$ measures whether aggregate retail sales increased by more in 1999 in prefectures where the coupons represented a larger increase in aggregate income relative to previous years (1990–1998).

Table 6 presents estimates of b_1 from Eq. (2). The first row in Table 6 presents estimates of b_1 in Eq. (2) over successive months after February. The estimated income elasticity of retail sales is 1.5 for March, 1.8 for April, 1.9 for May, 2.9 for June, and 2.7 for July, and are generally marginally significant. As before, we can estimate the "attenuation-corrected" marginal propensity to consume using the aggregate data on the fraction of coupons spent in each month. A survey of coupon recipients by the Economic Planning Agency in July 1998 (we presented some of the data from this survey in Fig. 1) indicates that 75% of the coupons were received in March, 21% in April and 3% in May. Using this information, the "attenuation-corrected" MPC for March is 0.10 ($1.47 \times 0.05 \times 1/0.75$), followed by 0.09 for April and 0.10 for May. These estimates are comparable with the MPC obtained by using the differential impact of the coupon program across families with children (Tables 1 and 2). In addition, perhaps because the sample size does not decline when we measure the longer run response to the coupons, we also find more consistent evidence that the coupons had a positive effect on spending in the longer run.

Finally, the second row of Table 6 presents estimates of the effect of the coupon program on retail sales of clothing and apparel. The estimated effect on spending are generally positive, but the estimates are less precise.

6. Conclusion

This paper investigated the effects of an experiment in fiscal policy undertaken by the Japanese Government in the spring of 1999. Under the shopping coupon program, the Japanese government handed out shopping coupons worth 20,000 yen (about 200 dollars) to the parents of families with children under the age of 15 and to roughly half of the elderly population. The coupons had to be used in the recipient's local community and expired if they were not used. We examined the effect of this program on spending using two sources of data to answer this question. The results using household level data demonstrate that the program stimulated consumption of semi-durables when the coupons were distributed. The MPC on semi-durables is 0.1–0.2 in March, with little evidence of a reversal in spending after the coupons were used. The results using regional variation in the impact of the program suggest that the MPC in March was of a similar magnitude, and provides stronger evidence that spending did not fall after the coupons had been redeemed.

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¹³ We compiled this data from the published tabulations of the *Current Survey of Commerce* (METI, various years).

¹⁴ From the "Annual Report on Prefectural Accounts" published by the Cabinet Office.

Appendix A

Appendix Table 1

Household consumption, income and demographics (FIES Panels, 1990–1999).

	February	March	April	May	June	July
Consumption						
Semi-durables	28,602 (47,420)	40,470 (55,716)	33,817 (44,745)	31,386 (41,787)	31,812 (43,000)	37,084 (48,000)
Non-durables	104,153 (39,932)	113,281 (41,321)	106,589 (39,000)	108,015 (36,681)	103,709 (38,842)	109,718 (40,721)
Services	104,644 (120,681)	123,304 (153,373)	123,835 (154,225)	112,165 (124,803)	108,802 (137,233)	121,220 (132,211)
Total (except durables)	236,494 (144,565)	275,768 (183,130)	262,885 (178,244)	250,662 (148,649)	243,283 (156,774)	266,552 (161,759)
Monthly income	611,668 (266,351)	611,033 (266,090)	610,986 (267,149)	612,889 (268,994)	612,384 (269,068)	607,468 (267,803)
Age (household head)	43.78 (10.00)	43.78 (10.00)	43.77 (10.02)	43.78 (9.99)	43.83 (10.00)	43.88 (10.03)
Number of children under 15	0.99 (1.04)	0.99 (1.04)	0.99 (1.04)	0.99 (1.04)	0.99 (1.04)	0.99 (1.04)
Number of other family members	2.50 (0.76)	2.50 (0.76)	2.49 (0.76)	2.50 (0.76)	2.49 (0.75)	2.51 (0.77)
Number of observations	25,827	25,827	20,899	15,950	11,002	5,546

Notes: The unit of observation is a household. Consumption and income are in yen at 2000 prices. Monthly income is pretax annual income divided by 12.

Appendix Table 2

Aggregate sales in prefectures (Survey of Commerce: 1990–1999).

	Retail sales	Clothing sales
October	38,516 (59,258)	16,476 (26,751)
November	38,388 (59,633)	15,892 (25,299)
December	57,749 (89,460)	20,945 (32,653)
January	39,186 (55,086)	16,901 (24,733)
February	32,132 (47,781)	11,665 (17,804)
March	40,467 (62,178)	16,724 (26,592)
April	37,577 (56,109)	15,031 (23,539)
May	37,617 (56,516)	15,180 (23,910)
June	37,175 (57,453)	14,593 (23,065)
July	45,787 (70,766)	16,793 (26,483)
Item		
Average monthly income	688,630 (778,073)	
Total coupons/monthly income (%)	2.25 (0.51)	
Retail sales/monthly income (%)	5.10 (1.31)	

Note: Unit of observation is a prefecture. Monthly income and retail sales are in million yen. Total coupon income is product of the number of coupons distributed in a prefecture and 20,000 yen. Monthly income is average of annual prefectural GDP from 1990 through 1999 divided by 12.

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