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The Wealthy Hand-to-Mouth in Japan: Evidence from 1983 to 2012

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Abstract

Using Japanese household panel data, this paper examines (i) what share of households are hand-to-mouth (HtM), (ii) what share of households are wealthy HtM (W-HtM), and (iii) whether W-HtM households respond more strongly to transitory income shocks than non-HtM (N-HtM) households. We find that approximately 11.2% of Japanese households are HtM, of which 7.3% are W-HtM, and that the consumption response of W-HtM households is similar to that of P-HtM and much larger than that of N-HtM households.

Keywords: Wealthy hand-to-mouth, illiquid wealth, household consumption
JEL Classification: D12, E21

1. Introduction

According to the standard life cycle/permanent income hypothesis, hand-to-mouth (HtM)[1] or borrowing-constrained households have a higher marginal propensity to consume (MPC) out of transitory income shocks than non-HtM (N-HtM). Positive transitory income shocks allow HtM households to consume close to an optimal level, and negative transitory income shocks reduce HtM households' consumption, because of scarce liquid assets. On the other hand, transitory income shocks have a minimal effect on N-HtM consumption, since they do not alter expected lifetime resources. Thus, it is important for policy makers to successfully identify the HtM households to increase the effectiveness of fiscal stimulus payments, such as shopping coupons (Hsieh, Shimizutani, and Hori, 2010; Kan, Peng, and Wang, 2017) and tax rebates (Johnson, Parker, and Souleles, 2006; Parker, et al., 2013).

One simple way to identify HtM households is to use the value of net worth (liquid wealth plus illiquid wealth minus debt). If net worth is positive, households are classified as N-HtM since they have enough wealth to achieve consumption smoothing. On the other hand, if it is non-positive, they are grouped as HtM. Kaplan and Violante (2014), however, showed that the identification of HtM households based on net worth *underestimates* the true fraction of HtM households. They argue that it is crucial to distinguish liquid wealth (e.g., demand deposits, stocks, and bonds) from illiquid wealth (e.g. housing wealth and the cash value of life insurance) since the latter is hard to liquidate to achieve consumption smoothing. They then define households with little net liquid wealth and no illiquid wealth as poor HtM (P-HtM) and households with little net liquid wealth and *abundant* net illiquid wealth as wealthy HtM (W-HtM). They also suggest that W-HtM should be categorized as HtM, even though their net worth is positive.

[1] For a rigorous definition of HtM households, see Section 2.2.

Kaplan, Violante, and Weidner (2014) also empirically examined whether W-HtM household consumption responds to transitory income shocks, as predicted by Kaplan and Violante's (2014) model, which uses the *Panel Study of Income Dynamics* for the United States between 1999 and 2011. Applying a methodology proposed by Blundell, Pistaferri, and Preston (2008), they showed that the MPC out of a transitory income shock is 0.301 for W-HtM, 0.243 for P-HtM, and 0.127 for N-HtM. These results imply that W-HtM households find it difficult to smooth consumption after transitory income shocks because of borrowing constraints, even though they have enough illiquid wealth.

In other countries, Cui and Feng (2017) used a Chinese cross-sectional dataset (the 2012 *China Household Finance Survey*) to show that approximately 17% of Chinese households are HtM, of which 15.3% are W-HtM and 1.7% are P-HtM. They also conducted an instrumental variable (IV) regression analysis and concluded that W-HtM households respond more strongly to income fluctuations than N-HtM, as predicted by the theory presented by Kaplan and Violante (2014).[2] Park (2017), employing a Korean panel dataset (the *Korean Labor & Income Panel Study*) for the 2001–2012 period, showed that about 37.5% of South Korean households are HtM, of which 25.3% are W-HtM and 12.3% are P-HtM. By conducting the same exercise as Kaplan, Violante, and Weidner (2014), they showed that the MPC out of transitory income shocks was 0.170 for W-HtM and 0.139 for N-HtM, which is also consistent with theory.

Using Japanese microdata, this paper investigates (i) what fraction of households are HtM, (ii) what fraction of households are W-HtM and (iii) whether the MPC for W-HtM out of transitory income shocks is higher than that for N-HtM. The current analysis is not the first attempt to delve into these questions using Japanese data. Hara, Unayama, and Weidner (2016), employing cross-sectional data from the *National Survey of Family Income and Expenditure* in 1989, 1994, 1999, 2004, and 2009, provided by the Statistics Bureau of Japan, found an HtM share of about 13%, of which nearly three-quarters were W-HtM.

In addition, Hara and Unayama (2015) analyzed Japan's 2009 two trillion-yen cash benefit program, put in place to alleviate the economic impact of the Great Recession. In this program, individuals less than age 19 or above age 65 were eligible to receive 20,000 yen (approximately 200 U.S. dollars). Others were eligible to receive 12,000 yen. Using Japanese household panel data (the *Family Income and Expenditure Survey*, hereafter FIES), Hara and Unayama (2015) showed that although N-HtM household consumption did not respond to transitory rises in income, HtM households increased their strictly defined, non-durable consumption expenditures by 0.38 yen with each 1-yen increase in income.

Our analysis differs from those of Hara, Unayama, and Weidner (2016) and Hara and Unayama (2015) in two ways. First, our sample period covers 30 years (1983–2012), versus five single years (1989, 1994, 1999, 2004, and 2009) for Hara, Unayama, and Weidner (2016) and three years (2008–2010) for Hara and Unayama (2015). Furthermore, the latter study lacks external validity. That is, it is not guaranteed that their findings that HtM households respond more strongly to transitory increases in income than N-HtM households also applies to other periods, such as the 1980s. By contrast, our longer 1983–2012 dataset alleviates the problem of external validity.

Our analysis, however, contains at least one drawback. Unlike the natural experimental approach taken by Hara and Unayama (2015), which sees the cash benefit program as an exogenous change in household income, our IV estimation approach (see Section 3) may still suffer from endogeneity problem. Nevertheless, we believe that our estimation results provide useful insights about household consumption behavior in Japan.

The remainder of the study is organized as follows. The next section introduces our dataset and identifies HtM households. Section 3 describes our empirical strategy and estimation results. Finally, Section 4 provides a conclusion.

[2] Note, however, that Cui and Feng's IV regression suffers from a weak instrumental problem. Thus, as they emphasize, we should treat their estimation results as a rough assessment of the consumption behavior of Chinese households.

2. Data and Empirical Strategy

2.1 Description of the Data

Our data were obtained from the FIES for the 1983–2012 period. The FIES, conducted by the Japanese Ministry of Internal Affairs and Communications, provides detailed information about household income, expenditures, and a variety of demographic characteristics, such as the age of heads of households and family size. Approximately 8,000 households are drawn randomly from the population, each household is surveyed for six consecutive months, and one-sixth of sample households are replaced by new households every month on a rolling basis. Since information about liquid assets and liabilities is not available for single-person households, it is not included in our analysis. In addition, since this information is only available for a limited number of households before 2002 (approximately 18.2% of the full sample), the sample size before 2002 is substantially smaller.

As Hara and Unayama (2015) show, housing comprises most illiquid wealth in Japan. However, information about housing wealth is not available in the FIES. To address this problem, we match several official statistics with the FIES and directly estimate the value of houses (buildings) and their land for each household in the FIES. To estimate housing wealth (see Iwamoto, et al. (2015) for details), we determine a household's approximate address and use the price of residential land per square meter at the closest survey location in the *Land Market Value Publication* (LMVP),[3] provided by the Ministry of Land, Infrastructure, Transport and Tourism. Land value is obtained by multiplying the land price per square meter at the location closest to a household's approximate address by the land area (square meters). The median (mean) distance between an approximate household address and the closest survey location in the LMVP is 0.53 (1.09) km.

The FIES provides information about floor space (in square meters), the structure of the dwelling (wooden, reinforced concrete, etc.), and the year of construction. We match FIES data with average construction costs (by type of building structure, municipality, and construction year) reported in the *Annual Report of Building Construction* (1953–2012) to calculate house values (specifically, by multiplying construction cost per square meter by the floor space). House values then are depreciated up to the survey year, using depreciation rates that vary with the dwelling's structure.[4]

2.2 Identification of HtM Households

Following Kaplan, Violante, and Weidner (2014), we identify HtM households in the following manner. First, let y_{it} denote the income of household i in pay period t, let a_{it} denote the value of net illiquid wealth, and let m_{it} denote average liquid net wealth over a pay period. For non-borrowers (non-negative, net liquid wealth holders), W-HtM and P-HtM households are defined as follows:

$$\text{(Non-borrowers, W-HtM)} \qquad a_{it} > 0, \quad \text{and} \quad 0 \leq m_{it} \leq \frac{y_{it}}{2} \tag{1}$$

$$\text{(Non-borrowers, P-HtM)} \qquad a_{it} \leq 0, \quad \text{and} \quad 0 \leq m_{it} \leq \frac{y_{it}}{2} \tag{2}$$

If households are HtM, they start a pay period with current income (y_{it}) and end it with zero cash on hand. Thus, they carry no liquid wealth from t to $t+1$. In this case, the average of net liquid wealth per pay period is half of current income. Therefore, if $0 \leq m_{it} \leq y_{it}/2$, households are classified as HtM. HtM households are also divided into two groups: wealthy and poor. Net illiquid wealth is positive for W-HtM households and non-positive for P-HtM households.

[3] Each year, the LMVP reports Japanese land prices per square meter (for 5,000–20,000 residential sites), as of January 1.

[4] Following the *Ministerial Ordinance for Durable Years of Depreciable Assets*, we employ the following annual depreciation rates: 9.9% for wooden structures, 4.8% for reinforced concrete or steel-frame structures, and 5.9% for other structures.

Similarly, if households are borrowers and at the credit limit $-\underline{m_{it}} < 0$, they consume all current income and available credit.[5] Therefore, for borrowers, W-HtM and P-HtM households are defined as follows:

$$\text{(Borrowers, W-HtM)} \qquad a_{it} > 0,\ m_{it} \leq 0, \qquad \text{and} \qquad m_{it} \leq \frac{y_{it}}{2} - \underline{m_{it}} \tag{3}$$

$$\text{(Borrowers, P-HtM)} \qquad a_{it} \leq 0,\ m_{it} \leq 0, \qquad \text{and} \qquad m_{it} \leq \frac{y_{it}}{2} - \underline{m_{it}} \tag{4}$$

Sample Selection

As in Kaplan, Violante, and Weidner (2014), we confine the sample to those where the head of household is between 22 and 79 years old. The sample excludes those where the head of household is self-employed, since monthly income is not available for self-employed households in the FIES.

Income

Our measures include income from labor, government, and private transfers. Interest income, dividend payments, and capital gains are excluded. Since the FIES provides monthly household income for six consecutive months, average monthly income is used to judge if households are HtM.[6]

Net Liquid Wealth

Net liquid wealth, defined as liquid wealth minus liquid debt, consists of demand deposits, time deposits, securities, and cash holdings. As emphasized in Hara, Unayama, and Weidner (2016), time deposits are included in net liquid wealth since they are relatively easy to liquidate in Japan. Liquid debt is total debt minus mortgage debt.

Net Illiquid Wealth

Net illiquid wealth, defined as illiquid wealth minus illiquid debt, is the sum of the estimated value of housing wealth and the cash value of life insurance. Illiquid debt is mortgage debt.

Descriptive statistics are summarized in Table 1. Between 1983 and 2012, the average share of HtM households is 11.2%, of which 7.3% are W-HtM and 3.8% are P-HtM. Compared with Kaplan, Violante, and Weidner's (2014) findings, which indicate that 31% of U.S. households are HtM (two-thirds W-HtM and one-third P-HtM), the Japanese share of HtM households is substantially lower. Table 1 also shows that although W-HtM households have ample net illiquid wealth (the median value is approximately 7.6 million yen), P-HtM households have zero (median) or negative (mean) net illiquid wealth.

Two important conclusions can be drawn from Figure 1, which displays the yearly shares of W-HtM and P-HtM households between 1983 and 2012. First, the share of HtM households increases from about 8% in 1983 to almost 14% in 2012. This finding is important for policymakers, since a rising share of HtM households implies more effective fiscal stimulus payments, such as shopping coupons and tax rebates. For instance, Hsieh, Shimizutani, and Hori (2010), using the FIES in Japan, show that HtM households receiving shopping coupons increase their semi-durable expenditures more than non-borrowing constrained households. Johnson, Parker, and Souleles (2006) also show that household consumption responses to tax rebate programs in 2001 were larger for households with low liquid wealth or low income. Second, although the share of W-HtM households is stable over time, the share of P-HtM trends upward after 2000, fluctuating around 1–2% before 2000 and reaching 6.4% in 2012. Since the share of W-HtM does not change much over the sample period, this is driven by the inflow of households from N-HtM to P-HtM.

[5] As in Kaplan, Violante, and Weidner (2014), we set the credit limit to one month's income.

[6] Averaging household income over 6 months is important since public pensions are paid bimonthly in Japan. Households that do not respond for six consecutive months are dropped from the sample.

Figure 1. Share of HtM Households

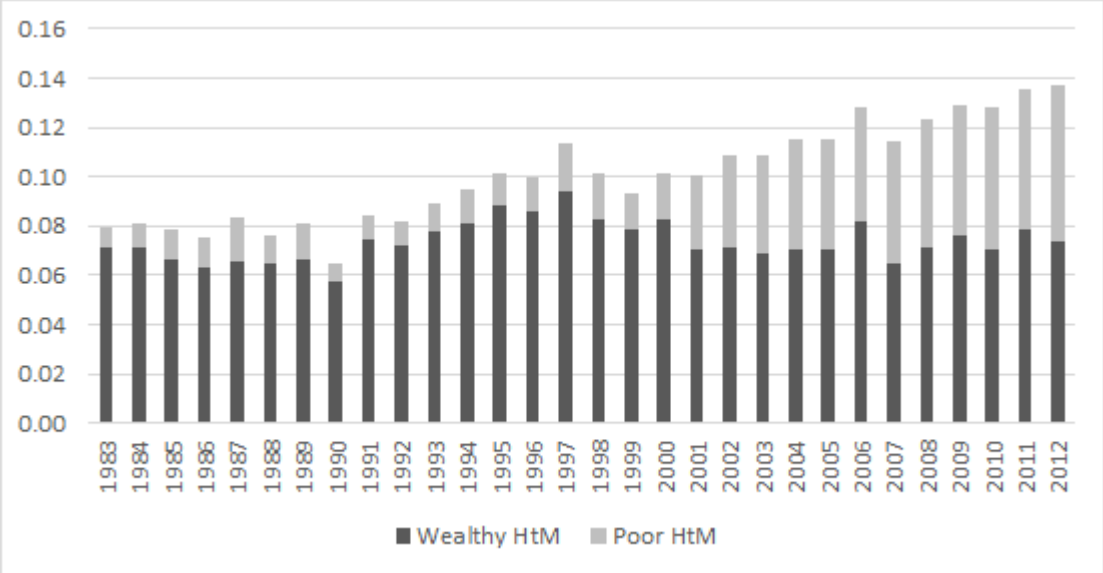

Table 1. Descriptive Statistics

	Full sample		N-HtM		W-HtM		P-HtM	
	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Age of household head	48.0	48.6	49.0	49.1	45.0	45.7	41.0	42.6
Montly household income	46.1	51.0	47.3	52.0	40.6	44.7	34.4	38.3
Household total expenditure	296.6	331.2	301.1	336.5	269.9	296.8	252.4	275.5
Net liquid wealth	452	932	554	1068	-40	-176	0	-87
liquid wealth	477	969	570	1083	22	76	4	33
liquid debt	0	37	0	15	97	253	30	120
Net iliquid wealth	1120	1718	1263	1839	756	1280	0	-240
Housing wealth	1403	1815	1483	1904	1128	1469	0	433
Non-liquid debt	0	451	0	442	0	422	0	717
Other iliquid wealth	198	355	205	378	110	233	0	44
# of households	110,308		98,002		8,060		4,246	
Sample share (%)	-		88.8%		7.3%		3.8%	

Notes: All monetary variables are nominal and in 10,000 yen. The sample period is 1983–2012.

As a robustness check, Table 2 summarizes the shares of different HtM households for different definitions of income. The second definition of income is disposal income (also reported in the FIES), calculated as total pretax household income minus any tax and social security payments. Disposal income identifies HtM households well since income, in our study, should be any type of cash on hand available for spending. Pretax income, therefore, overstates the percentage of HtM households by inflating the threshold for net liquidity wealth.[7] We can include households whose head is self-employed if we use the prior year's annual, pretax household income as our definition of income. In this case, annual income is divided by 12 to obtain monthly income.

[7] Nonetheless, we use pretax income as our baseline to make our results comparable with those of Kaplan, Violante, and Weidner (2014), which use pretax income in most countries (except Canada) to identify HtM households.

Table 2. Share of HtM in Each HtM Category

	P-HtM	W-HtM	N-HtM	HtM	HtM-NW
Baseline[a]	0.038	0.073	0.888	0.112	0.083
# of households			110,308		
Disposal income[b]	0.038	0.072	0.890	0.110	0.082
# of households			110,308		
Including self-employed[c]	0.041	0.079	0.880	0.120	0.090
# of households			142,535		

a. Income is defined as the sum of labor, government, and private transfer income minus non-regular income.
b. Disposal income is total household income minus any tax and social security payments.
c. Households where the head is self-employed are included. In this case, income is the prior year's pretax household income divided by 12 to obtain monthly household income.

As shown in Table 2, the shares of P-HtM and W-HtM are very similar for the three different definitions of income. Thus, it is quite robust in Japan that the shares of P-HtM and W-HtM are about 3–4% and 7–8% of total households, respectively. The last column of Table 2 also shows the share of HtM based on net worth (HtM-NW). As expected, the share of HtM-NW (8–9%) is smaller than the share of HtM, on the basis of net liquid and illiquid wealth (11–12%), since some W-HtM households with positive (and often substantial) net worth are excluded from HtM-NW. Thus, as emphasized by Kaplan, Violante, and Weidner (2014), identifying HtM households by net worth may underestimate the true HtM share.

3. Measuring MPC out of Transitory Income Shocks

The previous section noted that 11.2% of households are HtM, of which 7.3% are W-HtM. According to the theory developed by Kaplan and Violante (2014), the MPC out of transitory income shocks for W-HtM is predicted to be larger than that of N-HtM households, since W-HtM's assets are more difficult to liquidate and therefore less effectively smooth out consumption over time. In this section, following the methodology employed by Blundell, Pistaferri, and Preston (2008), we test this hypothesis by estimating MPCs out of transitory income shocks for N-HtM, W-HtM, and P-HtM households.

More precisely, we assume that the income process is the sum of a random walk (permanent) and an *i.i.d* shock (temporary) as follows:

$$y_{it} = z_{it} + \varepsilon_{it}, \tag{5}$$

where z_{it} follows a unit root process of $z_{it} = z_{i,t-1} + \eta_{it}$ and ε_{it} is an *i.i.d.* income shock. Taking a first-difference of Equation (5) gives

$$\Delta y_{it} = \eta_{it} + \Delta\varepsilon_{it}. \tag{6}$$

In this specification, the MPC out of a transitory income shock is defined as

$$MPC = \frac{\mathrm{Cov}(\Delta c_{it}, \varepsilon_{it})}{\mathrm{Var}(\varepsilon_{it})}. \tag{7}$$

The drawback of this approach is that ε_{it} is unobservable. Blundell, Pistaferri, and Preston (2008) show that if households have no advance information about future shocks, then

$$\mathrm{Cov}\left(\Delta c_{it}, \eta_{i,\,t+1}\right) = \mathrm{Cov}\left(\Delta c_{it}, \varepsilon_{i,\,t+1}\right) = 0, \tag{8}$$

and Equation (7) can be rewritten so that it depends only on observable variables:[8]

$$MPC = \frac{\mathrm{Cov}(\Delta c_{it}, \Delta y_{i,\,t+1})}{\mathrm{Cov}(\Delta y_{it}, \Delta y_{i,\,t+1})}. \tag{9}$$

Note that Equation (9) can be obtained from an IV regression of Δc_{it} on Δy_{it}, instrumented by $\Delta y_{i,\,t+1}$. To estimate Equation (9), we first regress log income and log consumption on year dummies, birth year cohort dummies, family size, prefectural dummies, and dummies for type of work by household heads. Then, taking advantage of the panel structure of FIES, we take a first-difference of stored residuals $(\Delta c_{it}, \Delta y_{it})$ and estimate Equation (9) by IV regression.

Table 3 shows the regression results for different types of HtM households. As the theory predicts, both P-HtM and W-HtM households have a higher MPC out of transitory income shocks than N-HtM. More precisely, for the baseline case, the MPCs are 0.163 (P-HtM), 0.150 (W-HtM), and 0.105 (N-HtM). The order of these figures does not change when we use disposal income to define income. In this case, the MPCs are 0.132 (P-HtM), 0.113 (W-HtM), and 0.070 (N-HtM). The size of MPCs for HtM households are much smaller than those reported by Kaplan, Violante, and Weidner (2014), whose MPCs are 0.243 (P-HtM), 0.301 (W-HtM), and 0.127 (N-HtM) for a baseline case. One possible explanation for the difference is that a larger discrepancy between optimal and current consumption levels for HtM households exists in the United States than in Japan. If so, transitory income shocks generate relatively volatile consumption responses. Although worth investigating, we leave this issue to future analysis.

Table 3. MPC out of Transitory Income Shocks for Different Types of HtM Households

	P-HtM	W-HtM	N-HtM	HtM-NW	N-HtM-NW
Baseline	0.163***	0.150***	0.105***	0.153***	0.107***
	(0.0158)	(0.0111)	(0.00288)	(0.0107)	(0.00284)
Disposal income	0.132***	0.113***	0.0697***	0.129***	0.0705***
	(0.0148)	(0.00952)	(0.00216)	(0.00951)	(0.00214)

The last two columns of Table 3 also compare the MPCs of HtM and N-HtM households, based on net worth. Since the identification of HtM households based on net worth is rough in a sense that at least some W-HtM households are excluded from the group of HtM, we expect that the difference in MPCs between HtM-NW and N-HtM-NW is smaller than that between HtM and N-HtM based on net liquid and illiquid wealth. Contrary to our expectation, the distinction between HtM-NW and N-HtM-NW also shows a clear difference in MPCs between two groups, probably caused by the small difference in HtM shares between two different identification strategies, compared with the situation in the United States. That is, the U.S. shares of HtM and HtM-NW are 0.312 and 0.137, versus 0.112 and 0.083 in Japan.

[8] With Equation (8), we can show that the following holds:
$$\mathrm{Cov}\left(\Delta y_{it}, \Delta y_{i,t+1}\right) = -\mathrm{Var}(\varepsilon_{it}) \text{ and } \mathrm{Cov}\left(\Delta c_{it}, \Delta y_{i,t+1}\right) = -\mathrm{Cov}(\Delta c_{it}, \varepsilon_{it}).$$

4. Conclusions

This paper examines (i) what share of households are HtM, (ii) what share of households are W-HtM, and (iii) whether W-HtM households, like P-HtM, respond more strongly to transitory income shocks than N-HtM households. Using a household-level panel dataset for Japan, we find that approximately 11.2% of households are HtM, of which 7.3% are W-HtM, and the consumption response of W-HtM households is similar to that of P-HtM and much larger than that of N-HtM households.

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