SOME COMMENTS ON THE USE OF MONETARY AND PRIMARY REWARDS IN THE MEASUREMENT OF TIME PREFERENCES

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The experiments reported in Halevy (2014) utilize cash payments to elicit subjects' temporal preferences. Some researchers (Cubitt and Read, 2007) argue that only primary rewards should be used to elicit such choices, since models of intertemporal preferences study the substitution between utility flows and not monetary payments. As such, the argument continues, all economists would agree that a subject should care only about the present value of payments, and then smooth her consumption throughout her lifetime. This rationale leads its holder to view discounting documented in experiments that use dated payments as an odd discounting behavior, which is orthogonal to "present-biased" preferences that determine saving and affect procrastination.

The above view has gained some traction ever since experimental economists started scrutinizing the descriptive applicability of the hyperbolic discounting model, leading several researchers to dismiss stark experimental findings. However, this skeptical perspective ignores crucial elements which suggest that experimental investigations of intertemporal preferences using monetary stimuli may inform us about the structure of these preferences. First, preferences over monetary rewards correlate well with preferences over primary rewards (Reuben et al., 2007) and several recent studies have found that discounting over monetary payments correlates with other behaviors (Kirby et al., 1999; Chabris et al., 2008; Meier and Sprenger, 2010)[1]. Second, neuroscience studies have found similar neural marking when using primary and monetary rewards (McClure et al., 2004, 2007). Moreover, such perspective is inconsistent with most of the existing (theoretical and experimental) research on preferences in the domain of risk and uncertainty where preferences are often defined over payments.

The source of the skeptical attitude towards experimental studies of intertemporal preferences using monetary stimuli is that under some version of the permanent income hypothesis, transitory changes in income (as those induced by experimental payments) should not affect consumption. However, this prediction has not been confirmed empirically, since there is no evidence that agents smooth their consumption when payments are relatively small. For example, Landsberger (1966) reports that when the German restitution payments to Israeli Holocaust survivor' households was less than 10% of the family's regular income, it lead to a substantial increase in consumption. Abdel-Ghany et al. (1983) find that consumption out of windfall earnings that are small relative to regular earning is very high, while when windfall earning are relatively large, consumption does not respond as much (i.e., agents smooth). The cited evidence above (as well as many other properties of the consumption function) led researchers to challenge the assumption of perfect capital markets incorporated in the standard model of consumption (Deaton, 1992). It is well known, that when liquidity constraints are introduced, they affect agents who want to borrow and if zero assets are carried forward for many periods then consumption changes will be equal to (earned) income changes over this period. Hence, the behavior of a liquidity constrained agent may look similar to a "rule of thumb" agent (who sets consumption equal to income). This behavior may also resemble that of an agent who can borrow as much as desired but has significant precautionary motive (Carroll, 1997). Moreover, the possibility of being liquidity constrained in the future may affect present consumption because the agent knows that she will not have access to credit market in order to smooth her consumption (Deaton, 1991), and it shortens

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[1]Note that some studies correlate behavior with measures of "present bias", while others study the correlation between discounting (impatience) more generally and behavior.

the agent's time horizon until the period in which this constraint is binding. Deaton (1991) simulates data and finds a "buffer-stock" behavior: consumption is either close to cash-on-hand (current income plus assets) if income is below mean income, or mean income plus some fraction of cash-on-hand above mean income.

More recent empirical studies are consistent with the above view, especially for young adults. Gourinchas and Parker (2002) estimate a structural model of life cycle consumption and find that consumption pattern of young agents behaves like buffer-stock consumers. Early in life saving is mostly precautionary and only around age 40 agents start to behave like forward looking in a life-cycle model. Card et al. (2007) use labor market data from Austria to study the effect of "cash-at-hand". Austrian workers who are fired after three years of employment get two months of severance pay and extended unemployment insurance (30 weeks instead of 20). They find that the lump-sum severance payment reduces job finding rate by 10% on average and that the extension of unemployment insurance benefits lowers job finding rates in the first 20 weeks by 5-9%, and find no effect on the match quality. Obviously, this evidence is inconsistent with the permanent income hypothesis and a naive "rule of thumb". The fact that lump-sum payment has a similar effect on search as insurance programs suggests that the channel is liquidity constraints. Kaplan and Violante (2013) document that many households hold substantial illiquid wealth, and respond to stimulus payments by spending substantial amount of it on non-durables shortly after it has been distributed (see also Johnson et al. 2006; Parker et al. 2013).

All the evidence above suggest that for the first-year students who participated Halevy (2014) and that generally have limited access to credit markets[2], changes in consumption probably follow small changes in income very closely. The belief that these subjects smooth consumption generated by the $10 or $100 payments in the experiments over an extended time span seems highly unlikely and is inconsistent with the evidence cited above. Moreover, only relatively small payments, which induce moderate changes in consumption (that are associated with small changes in utility) can inform us about the *marginal* rates of substitution between utility flows.[3] Furthermore, usage of small primary rewards that are often tempting may confound temptation-driven preferences (as modeled by Gul and Pesendorfer, 2001; Fudenberg and Levine, 2006) with dynamically inconsistent preference. Large stakes primary rewards are almost never directly observable, and even if they were - could not inform us about marginal rates of substitution. This leads to the conclusion that the monetary incentives employed in Halevy (2014) are at a level that is appropriate to inform researchers on the structure and properties of intertemporal preferences.

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[2]The law in British Columbia allows the issuance of credit card only to residents who are at least 19 years old.

[3]Indeed, almost all experiments we are aware of use relatively small monetary rewards. Some experiments, as Read and van Leeuwen (1998), use trivial primary rewards (choice of a snack) to study intertemporal preferences. Although it finds evidence for time inconsistency, it also reports strong effect of random visceral state (as hunger) on advanced and immediate choice, which Halevy (2014) call *time varying* preferences. Note that the research methodology there relies explicitly on deception, and hence interpretation of the results is especially problematic.

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