Risk Attitudes do not explain Cash Holdings

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Abstract

Despite the long-term trend away from cash and the widespread adoption and acceptance of payment cards, many people still carry considerable amounts of cash. In a preregistered study, I examine whether risk attitudes can explain consumers' persistent cash holdings. To self-insure against the possibility of being unable to pay by card, risk-averse consumers are expected to hold cash in larger amounts. Moreover, consumers who overweight the small probability of card non-acceptance and those who prefer early resolution of uncertainty are also predicted to carry more cash. I test these predictions using data from the RAND American Life Panel (N = 989) and on experimental preference data from Swiss consumers (N = 1'666). 86% of U.S. and 95% of Swiss individuals carry cash in their wallets, with an average of USD 64 and CHF 94, respectively. Neither risk aversion, probability weighting, nor a preference for early resolution of uncertainty are consistently related to cash holdings.

Keywords: cash holdings, money demand, risk aversion, probability weighting, uncertainty resolution, pre-analysis plan

JEL Codes: D14, D81, D91, E41, G41, O33

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"Why is economic research on cash needed? A short and simple answer to this question is that cash does not seem to be going away." – Shy (2023)

1. Introduction

Despite the long-term decline in cash use, accelerated by the COVID-19 pandemic, many consumers continue to carry substantial amounts of cash in their wallets (Foster et al., 2022, Shy, 2023). Figure 1 shows that in two representative datasets, 86% of U.S. and 95% of Swiss individuals hold cash, with average amounts of USD 634 and CHF 94[1], respectively. Moreover, while the share of cash payments has steadily declined in recent years, average cash holdings have remained remarkably stable. This juxtaposition highlights a central puzzle: Why do consumers still carry cash, even though more convenient payment instruments such as debit and credit cards are widely available and accepted? This transaction demand for cash, i.e., the amount consumers carry for payment purposes is what this study aims to explain[2].

Understanding the persistence of transactional cash holdings is important not only from a behavioral perspective but also from a policy perspective. Detailed evidence on consumer payment behavior is essential for the design of payment systems that are safe, efficient, and inclusive. This knowledge has become particularly important as central banks explore innovations such as central bank digital currencies (CBDCs) (Huynh et al., 2024, Nocciola and Zamora-Pérez, 2024).

At the point of sale, consumers face two types of risk when paying by card compared to cash: either the merchant does not accept card payments or they are temporarily not possible, for example, because of payment system outages. Even though these occasions are rare and average acceptance ratings of credit and debit cards have surpassed those of cash in recent years (Stavins, 2017), situations in which consumers are unable to make a desired purchase may be particularly memorable. In particular, payment system disruptions are very salient and widely covered in the news.[3] Therefore, I hypothesize that by holding cash, consumers self-insure against being

[1] This corresponds to USD 104 in 2023.

[2] Consumers hold cash for transaction purposes (means of payment) and for store of value purposes. I consider only the former. In addition, while cash holdings and use are not the same, i.e., a consumer can hold cash in his wallet but never use it, previous literature documents a positive correlation (e.g., Arango et al., 2011, Huynh et al., 2014, Schuh and Briglevics, 2020). The likelihood of using cash increases with the amount of cash holdings (Arango et al., 2015).

[3] See, for example, the coverage of a widespread malfunction of subway ticket machines in New York in 2008 by the *New York Times* or the coverage of a more recent worldwide IT outage in 2024 by the *Guardian*.

unable to pay by card at a point of sale. Thus, attitudes toward risk and uncertainty are expected to affect cash holdings[4].

To investigate the role of risk aversion in cash holdings, I draw on two types of models that address card non-acceptance by merchants. The first model, proposed by Huynh et al. (2014), builds on the Baumol–Tobin inventory framework, in which consumers hold cash to reduce transaction costs, such as "shoe leather" costs (Baumol, 1952, Tobin, 1956)[5]. The second model, based on precautionary demand (Telyukova, 2013, Telyukova and Wright, 2008), views cash as a safeguard against idiosyncratic expense shocks when card payments are unavailable. Both types of models predict that more risk-averse consumers will hold larger cash balances.

In addition to risk aversion, I suggest two behavioral explanations that exacerbate uncertainty-driven precautionary motives: probability weighting and preferences for early resolution of uncertainty. On the one hand, consumers might have subjective beliefs that overstate the small probability of not being able to pay by card (e.g., Tversky and Kahneman, 1992). Probability weighting is a principal element of Prospect Theory (Kahneman and Tversky, 1979), which allows risk preferences to be probability-dependent. Thus, consumers' *perceived* card acceptance is lower than actual card acceptance in shops, driving these individuals to self-insure against card non-acceptance with cash. It is therefore the very fact that card non-acceptance is rare that distorted beliefs matter for cash holdings.

The possibility of a foregone purchase due to card non-acceptance may also cause anticipatory anxiety. Building on the idea of Biener et al. (2024) in the domain of insurance, these consumers acquire "peace of mind" by holding cash to insure against not being able to pay by card (e.g., Caplin and Leahy, 2001, Loewenstein, 1987)[6]. Persistent cash holdings would thus be explained by anticipatory anxiety. This creates a preference for early resolution of uncertainty, achieved by carrying a universally accepted means of payment.

To empirically study whether precautionary motives (Telyukova, 2013), probability weighting (Tversky and Kahneman, 1992), and a preference for early resolution of uncertainty (Caplin and Leahy, 2001) explain persistent, widespread cash holdings, I use two datasets. First, in my

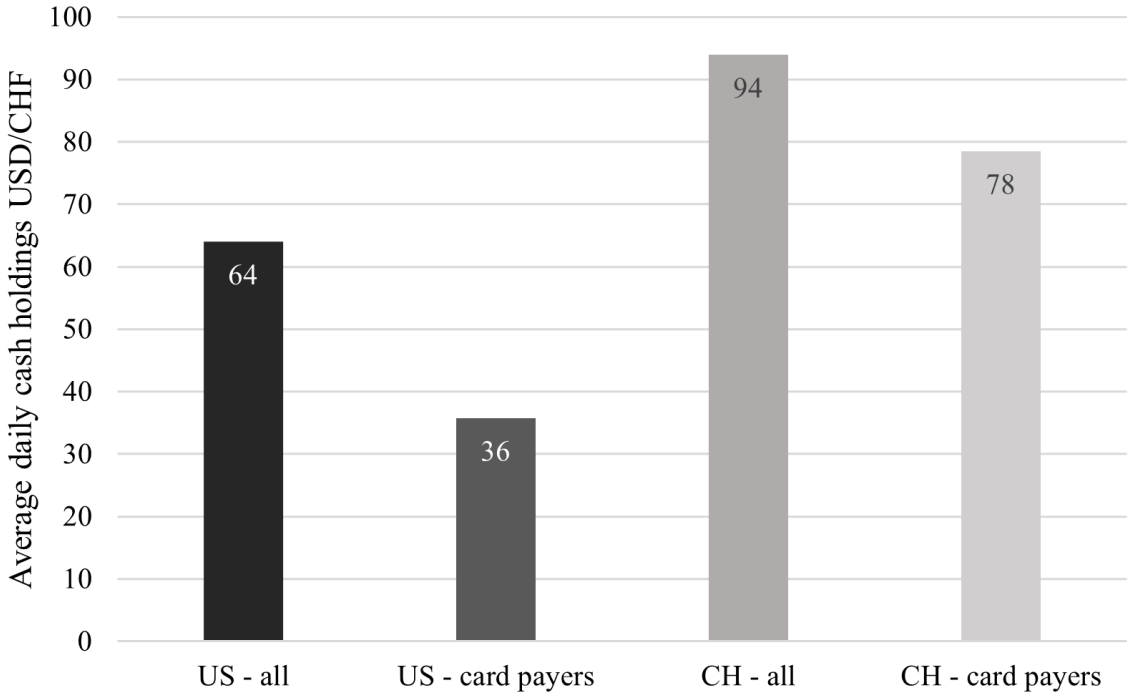
[4]People may hold cash for various other reasons, including habit (Van der Cruijsen and van der Horst, 2019), privacy concerns (Kahn et al., 2005), and budgeting motives (Von Kalckreuth et al., 2014).

[5]Recent examples are Alvarez and Lippi (2009), Alvarez and Argente (2022), Alvarez and Lippi (2017).

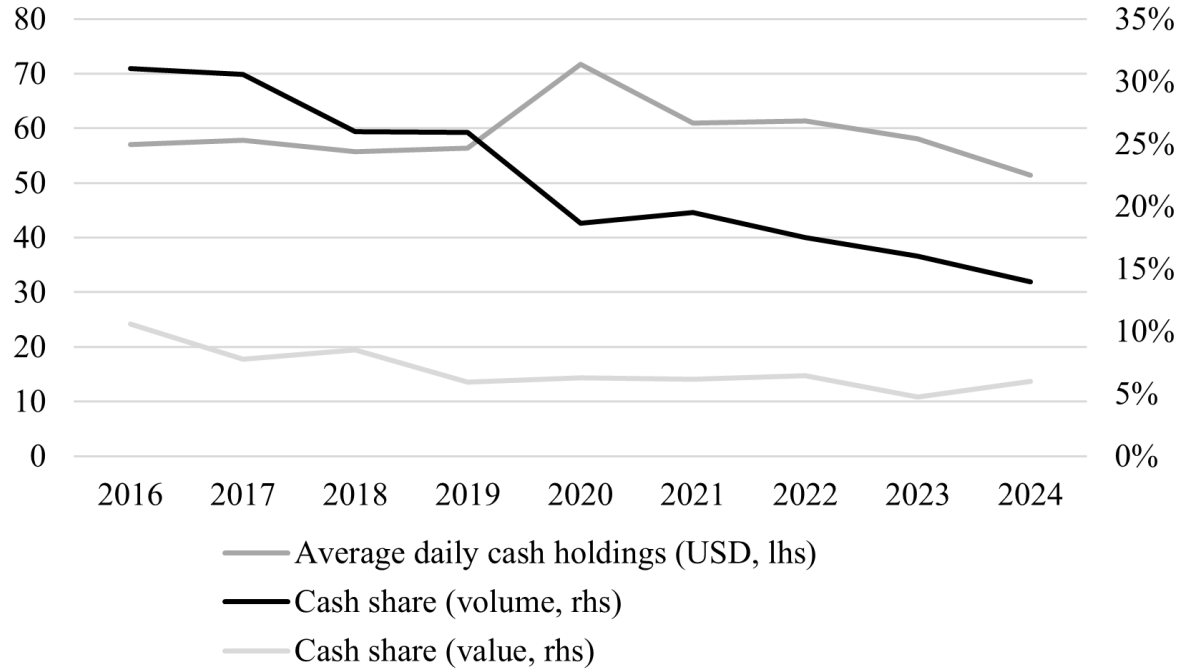
[6]Following the same reasoning, individuals with a preference for early resolution of uncertainty are also expected to acquire "peace of mind" in other domains of their lives, for example by purchasing insurance. Another study, which is part of the same research project as this paper, examines the role of the timing of resolution of uncertainty and insurance demand using the same dataset as the present project (see Biener et al., 2024).

Figure 1: The transaction demand for cash

Panel A. Mean on-person cash holdings



Panel B. Cash use and holdings



Panel A shows the average on-person cash holdings (excluding the top 1% of observations of very large-value holdings) in USD and CHF for all U.S. consumers (U.S. sample $N = 989$) and Swiss consumers (Swiss sample $N = 1'666$), as well as for subsamples of U.S. consumers that never pay cash ($N = 117$) and Swiss consumers who consider themselves predominantly card payers ($N = 1'014$). Panel B displays the time trend in average daily cash holdings in the U.S. in USD (left axis) alongside the cash share of payments by volume and value (right axis) from 2016 to 2024 in 2016 USD. Source: Federal Reserve Bank of Atlanta Survey of Consumer Payment Choice and Diary of Consumer Payment Choice.

main analysis, I combine two surveys conducted using the RAND American Life Panel (ALP)[7], a representative longitudinal sample of the U.S. population. I combine payment behavior data from the Boston Fed Survey of Consumer Payment Choice (SCPC) fielded in 2014 (Greene et al., 2016) with information on preferences and probability weighting gathered by Dimmock et al. (2021) in 2017, and obtain a sample of 989 consumers (U.S. sample).

Second, I validate my analysis for risk aversion and test whether a preference for early resolution of uncertainty and anticipatory anxiety are associated with cash holdings using survey data of 1'666 customers of a large Swiss primary insurer from a research project conducted by Biener et al. (2024)[8] (Swiss sample). We set up an experiment with incentivized decisions on asset allocation choices, which are used to generate indices for risk preferences and preferences for the timing of resolution of uncertainty. Furthermore, the information gathered includes non-incentivized survey responses on payment behavior, as well as a rich set of self-reported and administrative socioeconomic characteristics. This study follows two pre-analysis plans (Olken, 2015), registered prior to data access[9].

In the U.S. sample, I find no consistent relationship between cash holdings and either risk aversion or probability weighting. Furthermore, individual traits such as optimism and trust[10], cognitive abilities such as financial literacy, and socioeconomic characteristics do not reliably explain why consumers, on average, carry USD 64 in cash. Furthermore, past negative experiences, such as losing or having cards stolen, do not correlate with cash holdings (Malmendier, 2021). In the Swiss sample, my findings validate the null results from the U.S. sample, showing no association between risk aversion and cash holdings[11]. Additionally, a preference for early resolution of uncertainty does not significantly influence cash levels. However, data consistently indicate that beliefs about card acceptance impact cash holdings: consumers who are less confident in card acceptance tend to hold more cash. Consistent with previous findings, older and wealthier consumers tend to carry larger amounts of cash (Shy, 2023).

This project contributes to the literature on the determinants of consumer transactional de-

[7] More information about the RAND ALP can be found here.

[8] Biener and Epper (2023) study the role of preferences and beliefs in explaining real financial decisions.

[9] The pre-analysis plans are registered on the Centre for Open Science (OSF) repository: https://osf.io/bprh2/.

[10] Recent research by Wischnewsky (2024) emphasizes that trust plays a central role in shaping overall cash demand in a country. She documents a nonlinear "Arch of Trust" relationship, whereby both low and high levels of trust in a society are associated with lower cash usage, albeit through different channels: distrust increases precautionary hoardings, while high trust reduces precautionary motives and supports the transition to digital payments.

[11] On the importance of null results, see a recent survey in *Nature*.

mand for cash (see Shy, 2023, Stavins, 2017), specifically behavioral explanations for persistent, widespread cash holdings and use (Von Kalckreuth et al., 2014, Ching and Hayashi, 2010, Ebner et al., 2021, Fusaro, 2013, Van der Cruijsen et al., 2017, Van der Cruijsen and van der Horst, 2019). For instance, Van der Cruijsen and van der Horst (2019) put forth habit persistence, rational or irrational, as a reason for prevailing cash use, while Von Kalckreuth et al. (2014) suggest budget control motives aided by the characteristics of cash. However, to my knowledge, there is no research investigating risk attitudes to explain transactional cash demand. Thus, I add to this literature by examining whether probability nonlinearity can explain prevailing cash holdings.

My paper also contributes to the empirical literature on the role of non-standard economic preferences, notably probability weighting, for real-world financial behavior. As Prelec (1998, p. 89) notes, "I believe, indeed, that probability nonlinearity will eventually be recognized as a more important determinant of risk attitudes than money nonlinearity." Prior studies have investigated betting markets (Jullien and Salanié, 2000, Snowberg and Wolfers, 2010, Chiappori et al., 2019), insurance decisions (Sydnor, 2010, Barseghyan et al., 2013), and household portfolio choice (Dimmock et al., 2021, Barberis and Huang, 2008); for an overview, see Fehr-Duda and Epper (2012). However, evidence for cash management, a domain that affects everyone, has been missing.

Finally, this paper adds to empirical studies investigating the role of anticipatory emotions and resulting preferences for the resolution of uncertainty and information-dependent utility. Early theoretical models of non-expected utility, starting with Kreps and Porteus (1978) and Chew and Epstein (1989) are agnostic about the origins of preferences for resolution timing. Building on Loewenstein (1987)'s extension of discounted utility theory with anticipatory feelings, a theoretical literature on information-dependent utility has emerged, notably Caplin and Leahy (2001) and Kőszegi and Rabin (2006, 2009). Previous research has investigated the timing of uncertainty resolution preferences in other economic domains such as insurance demand (Biener et al., 2024), and consumption and asset pricing (Epstein et al., 2014, Kadan and Manela, 2019). To my knowledge, this study provides the first evidence that directly measures anticipatory feelings and preference for resolution timing to explain cash holdings.

The remainder of this paper proceeds as follows. Section 2 presents the hypotheses to be tested. Section 3 describes the data and defines the outcome and explanatory variables of my

main analysis of the U.S. sample. Section 4 provides empirical evidence for the U.S. sample while Section 5 documents the validation and additional findings for the Swiss sample. Section 6 concludes the paper with a summary.

2. Theoretical framework

To derive and organize my hypotheses on the influence of risk attitudes on cash holdings, I build on money demand models either of the Baumol-Tobin type (Baumol, 1952, Tobin, 1956) or of the "precautionary demand" type (Telyukova, 2013).

2.1 Inventory model

Huynh et al. (2014) propose a "shopping-time model" (see also Attanasio et al., 2002, McCallum and Goodfriend, 1987) that extends the classical Baumol-Tobin inventory model by accounting for card non-acceptance. I use a simplified version of their model[12] of the transaction demand for money to illustrate how subjective beliefs about card acceptance influence cash holdings.

Consumers need time to make transactions, and cash is a way to save on shopping time. Consumer i makes transactions to finance consumption c_i, which takes time τ_i to complete and come with opportunity costs of time ω. In a shop, consumer i can either pay by cash or card, which depends on the merchants' acceptance of these payment methods. $s_i \in [0, 1]$ is the share of purchases consumer i can pay by card. Like Huynh et al. (2014), I assume that s_i is exogenous and given by the market infrastructure and the consumer's subjective beliefs about a merchant's card acceptance[13]. Let R be the annual interest rate, which reflects the opportunity cost of holding cash, and let ϵ_i be unobservable consumer-specific factors that affect the shopping time. Consumer i trades off the time cost of transactions against the cost of holding cash and chooses optimal cash balances M_i accordingly. Therefore, consumer i aims to minimize the sum of the costs of cash holdings RM_i and transaction time $\omega\tau_i$:

$$\min_{M_i} \left(RM_i + \omega\tau_i \right)$$

[12] I ignore the responsiveness of cash demand with respect to consumption expenditure and set their parameter $\beta = 1$, like in the classic Baumol-Tobin model.

[13] In this model, s_i is exogenous to the shopper. However, Huynh et al. (2014) point to the possible endogeneity of this card payment share: a consumer with little cash holdings might choose to frequent shops he suspects or knows to accept cards. In their empirical analysis, Huynh et al. (2014) use an instrumental variable approach and document a significant role of endogeneity in cash management decisions.

subject to

$$\tau_i \;=\; \left(\frac{c_i}{M_i}\right) e^{\gamma s_i + \epsilon_i}.$$

where the required shopping time τ_i decreases when consumer i holds more cash M_i and is shaped by the payment environment $e^{\gamma s_i + \epsilon_i}$, which captures the influence of card acceptance and unobserved consumer-specific factors on transaction time.

Consumer i's transaction demand for cash then is

$$M_i \;=\; \sqrt{\frac{\omega\, c_i\, e^{\gamma s_i + \epsilon_i}}{R}}$$

Taking the natural logarithm gives

$$\ln M_i \;=\; \tfrac{1}{2} \ln\!\left(\tfrac{\omega c_i}{R}\right) \;+\; \tfrac{1}{2}\gamma s_i \;+\; \tfrac{1}{2}\epsilon_i$$

γ is the responsiveness of cash demand with respect to card acceptance. It captures both the payment infrastructure and the consumer's perception of it. Here, s_i can be thought of as the fraction of consumer i's payments in value terms, which could have been made with card. Larger s_i are expected to reduce cash demand M_i, which is confirmed by negative estimates of γ in empirical studies (Huynh et al., 2014). Therefore, γ measures how much consumers dislike expected card non-acceptance at the point of sale.

As s_i incorporates a consumer's perception of a merchant's adoption of a card payment terminal, shoppers who overweight the probability that a merchant does not accept cards, perceive lower levels of s_i. For a given level of risk aversion, these consumers would carry larger amounts of cash M_i compared to consumers without distorted perceptions[14]. Therefore:

> **H2:** The more pronounced a consumer's overweighting of the small probability of frequently not being able to pay by card at the point of sale is, i.e., the more pronounced his probability weighting, the larger the cash amounts he carries on him.

[14] While my pre-analysis plan included hypotheses on the extensive margin, very few individuals hold no cash. I therefore do not report extensive margin results in the main text but provide them in the appendix (Table A8 and Table B3).

2.2 "Precautionary demand" type model

Telyukova (2013) develops a dynamic stochastic partial-equilibrium model of consumer payment choice in which consumer credit and liquidity coexist and consumers face uncertainty over cash-only consumption. Because these cash needs are unpredictable, consumers hold precautionary cash balances to avoid costly situations where credit cards cannot be used.[15]

In her discrete-time model, there is a $[0, 1]$ continuum of infinitely lived consumers. Each time period t is divided into two subperiods $j = \{1, 2\}$. In the first subperiod, at the beginning, income is determined[16], and subsequently consumers can either pay by credit card b_{1t} for consumption c_{1t} (saving is also possible) or pay cash M_{1t}. Note that credit card borrowing is costly. In the second subperiod, consumer borrowing is no longer possible and consumption c_{2t} needs to be financed entirely by remaining cash holdings M_{2t}. Crucially, at the beginning of this second subperiod a preference shock z_t realizes, which represents unforeseen expenditures. The optimization problem is formulated recursively, and consumers have lifetime utility, non-separable in the two consumption goods:

$$\mathbb{E}_0 \sum_{t=0}^{\infty} \beta^t \, u(c_{1t}, z_t c_{2t})$$

In the second subperiod, after knowing about unforeseen cash needs, consumers choose consumption c_{2t}, which they need to finance with remaining cash balances M_{2t}. They maximize this period's utility plus discounted expected future consumption subject to their cash constraint, and where remaining liquidity and credit/savings are carried over to the subsequent period.

Telyukova (2013) assumes a standard CRRA utility function,

$$u(c_{1t}, z_t c_{2t}) = \frac{\left((1-\alpha)c_{1t}^{\nu} + z_t \alpha c_{2t}^{\nu}\right)^{\frac{1-\gamma}{\nu}}}{1-\gamma}, \quad \gamma > 1$$

where α is the share parameter of the constant elasticity of substitution (CES) aggregator and ν is the elasticity of substitution. In this utility function, consumption can be seen as a

[15] The model is based on Lucas and Stokey (1985) who developed a general equilibrium model in which a cash-in-advance constraint applied to the purchase of a subset of goods drives the use of money (Walsh, 2017).

[16] Income is stochastic and at the beginning of the first subperiod, income shocks realize. These income shocks are necessary to induce borrowing in this model. However, as I focus on cash demand, these income shocks can be neglected.

risky prospect due to the risk to second subperiod consumption c_{2t} stemming from idiosyncratic expense shocks z_t. If the realized expense shock is low, the consumer might have enough cash left to consume everything he needs. However, if unforeseen expenditures are large, the consumer might not have enough cash left in his wallet and might have to forgo consumption, which is very costly. To insure against costly forgone cash-good consumption, consumers can only increase their cash holdings M_{2t}, which is also costly (first subperiod credit card borrowing). If we think of these costs of cash holdings as risk premia, more risk averse consumers are willing to pay larger risk premia to assure consumption and thus are expected to hold larger cash balances. At the intensive margin, I expect that,

> **H1:** The more risk averse a consumer is, the larger the cash amounts he carries on him.

In this framework, the risk of not being able to pay by card appears as unforeseen shocks z_t to consumption that can only be paid in cash c_{2t}. Consumers exhibiting probability weighting would overweight the probability of rare, large, unexpected cash-good expenses. This is equivalent to overweighting the small chance of card non-acceptance at a merchant in daily life. Therefore, for a given level of risk aversion, these consumers would hold larger cash amounts M_{2t}. Consequently,

> **H2:** The more pronounced a consumer's overweighting of the small probability of frequently not being able to pay by card at the point of sale is, i.e., the more pronounced his probability weighting, the larger the cash amounts he carries on him.

In standard transaction demand for currency models à la Baumol (1952) and Tobin (1956), there is no inherent uncertainty. Cash management is determined by consumers who minimize the opportunity (forgone interest) and transaction (e.g. "shoe leather") costs of cash. However, in extensions of the classic Baumol-Tobin inventory model as proposed by Huynh et al. (2014), uncertainty enters the model by introducing the possibility of card non-acceptance at the merchant. By contrast, in models of precautionary transaction demand for money like the one proposed by Telyukova (2013), uncertainty is an integral element. Here, cash management is determined by payment infrastructure constraints that create uncertainty about which means of

payment a consumer can use to buy specific goods. Importantly, in both frameworks, consumers may have subjective beliefs of card non-acceptance, i.e., when they think that there is a risk of not being able to pay by card. Thus, I conjecture that

> **H3:** The lower a consumer's rating of perceived card acceptance at the point of sale, the larger the cash amounts he carries on him.

Besides subjective beliefs, which concern decisions under risk, attitudes towards temporal risk resolution may explain why consumers still carry cash. Idiosyncratic expense shocks due to card non-acceptance occur in the future, potentially inducing worry or anticipatory anxiety about costly forgone consumption. Carrying cash can provide "peace of mind" by immediately resolving the uncertainty of being unable to pay at a shop later (Biener et al., 2024, Caplin and Leahy, 2001).[17] Therefore, I derive the following hypothesis on preferences of uncertainty resolution timing:

> **H4:** Consumers with a preference for early resolution of uncertainty carry larger cash amounts on them.

I further hypothesize that these preferences for early resolution of uncertainty are driven by negative anticipatory emotions – such as anxiety or worry – because holding cash allows individuals to avoid these feelings through immediate resolution (Kocher et al., 2014).

> **H5:** Consumers with a preference for early resolution of uncertainty are more likely to state that negative emotions, i.e., anticipatory anxiety or worry, are driving their decision. These consumers with negative anticipatory feelings are more likely to carry cash.

[17] Caplin and Leahy (2001) use a similar argument to explain the risk-free rate puzzle: purchasing a risk-free asset buys "peace of mind", helping to rationalize the low risk-free rate.

3. Data and variables

3.1 U.S. sample: RAND American Life Panel survey

I link two RAND ALP surveys conducted on a representative sample of the U.S. population in 2014 and 2017. The ALP is an online panel with over 6'000 Americans aged 18 and older.[18] I combine a survey by Dimmock et al. (2021), fielded from June 20 to July 19, 2017, that elicits individual-level risk attitudes, with the Boston Fed Survey of Consumer Payment Choice (SCPC), conducted from October to December 2014 (Greene et al., 2016) (Table 1). The SCPC is a recall-based survey of payment behavior that was implemented annually using the ALP from 2008 to 2014. After linking the two RAND surveys and cleaning the data, I obtain a final sample of 989 respondents (Table 2). I also draw several variables for alternative explanatory channels from additional RAND ALP surveys (Choi and Robertson, 2020, Dimmock et al., 2016, Stango et al., 2017). Table 3 provides summary statistics of the main variables.[19]

Because the SCPC was no longer conducted using the ALP after 2014, I link two surveys fielded three years apart and assume that cash holdings and probability weighting remain stable over time[20]. The U.S. payment survey data as well as previous research demonstrate that payment habits are rather persistent (Mooslechner et al., 2006, Van der Cruijsen and van der Horst, 2019, Brown et al., 2022, Schildberg-Hörisch, 2018). However, empirical evidence on the stability of decision weights over time is mixed, and long-term studies are lacking (Fehr-Duda and Epper, 2012, Glöckner and Pachur, 2012, Zeisberger et al., 2012).

[18] More information on the RAND ALP can be found here.

[19] See Table A1 for all variable definitions and survey sources. Two control variables, *Family income* and *Financial wealth*, have missing values. I impute them using group median imputation following Dimmock et al. (2021).

[20] The survey now uses the University of Southern California's Understanding America Study (UAS).

Table 1: Overview of RAND ALP surveys

Main surveys	**N**	**Time**	**Variables**
Greene et al. (2016) Well Being 401 - Boston Fed Survey of Consumer Payment Choice (2014)	1'809	06.10.2014 - 16.12.2014	*Cash Holdings* *Cash Holdings Amount* *Card Acceptance* Non-preregistered control variables on payment behavior
Dimmock et al. (2021) Well Being 481 - Retirement Saving and Probability Weighting	2'670	20.06.2017 - 20.07.2017	*Risk Aversion* *Probability Weighting* Alternative Probability Weighting variables Parametric Probability Weighting measures Socioeconomic control variables *Optimism*, *Financial literacy*, *Numeracy*, *Trust*
Other surveys	**N**	**Time**	**Variables**
Stango et al. (2017) Well Being 472 & 474	879 & 1'076	2017	*Risk attitude – general* *Risk attitude - financial* Barsky et al. utility curvature textitOverconfidence
Choi and Robertson (2020) Well Being 465	1'255	2016	*Loss aversion*
Dimmock et al. (2016) Well Being 481	3'290	2012	*Ambiguity aversion*

The table summarizes the features of the RAND American Life Panel (ALP) surveys that I link for the empirical analysis of the U.S. sample of this study.

Table 2: Construction of the U.S. sample

Survey	**Number of excluded respondents**	**Number of respondents remaining**
Well Being 481 – Retirement Saving and Probability Weighting		2'765
Well Being 401 – Boston Fed Survey of Consumer Payment Choice (2014)		1'810
Merged sample		1'053
Exclude respondents that did not finish the survey	28	1'025
Exclude respondents that did not answer all 4 risk aversion questions	3	1'022
Exclude respondents that did not answer all 6 probability weighting questions	1	1'021
Exclude respondents for whom there are missing outcome variables	18	1'003
Exclude respondents for whom there are missing explanatory variables	14	989
Sample for main analysis	**64**	**989**

The table summarizes the construction of the final U.S. sample for the empirical analysis of this study based on the raw data samples of Rand ALP surveys Well Being 481 and 401.

Table 3: Summary statistics of the U.S. sample

Variable	Mean	Median	SD	Min	Max	N
Outcome variables						
Cash Holdings Amount	63.87	25.00	93.83	0.00	600	989
Cash Holdings	0.86	1.00	0.35	0.00	1.00	989
Explanatory variables						
Risk Aversion	0.12	0.08	0.25	-0.29	0.54	989
Probability Weighting	0.74	0.82	0.79	-1.54	2.96	989
Card Acceptance	4.64	5.00	0.66	1.00	5.00	989
High Card Acceptance*	0.72	1.00	0.45	0.00	1.00	989
Socioeconomic control variables						
Age	48.37	47.00	15.35	24.00	91.00	989
Female	0.52	1.00	0.50	0.00	1.00	989
Married	0.59	1.00	0.49	0.00	1.00	989
White	0.64	1.00	0.48	0.00	1.00	989
Hispanic	0.18	0.00	0.38	0.00	1.00	989
Number of household members	2.85	3.00	1.57	1.00	11.00	989
Employed	0.57	1.00	0.50	0.00	1.00	989
Family income	83.03	87.50	55.56	2.50	200	989
Financial wealth	62.39	1.00	440.17	0.00	6’021	989
Housing wealth	147.51	85.00	195.88	0.00	4’000	989
No college degree	0.60	1.00	0.49	0.00	1.00	989
Bachelor’s/Associate’s degree	0.29	0.00	0.45	0.00	1.00	989
Master’s or higher degree	0.11	0.00	0.32	0.00	1.00	989
Behavioral control variables						
Financial literacy	1.95	2.00	0.84	0.00	3.00	989
Numeracy	2.43	3.00	0.81	0.00	3.00	989
Trust	1.66	2.00	1.26	0.00	5.00	989

This table reports summary statistics for the main variables used in the U.S. sample. All results use post-stratification weights.
*This variable has not been preregistered.

3.2 Outcome variables

In empirical research, it is not always evident to distinguish cash hoarding from cash holding for transactional purposes. I follow Shy (2023)[21] definition that hoarding is long-term holding of cash (stock variable), whereas holding is keeping cash for transactional purposes (flow variable). This study aims to explain variation in cash holdings for everyday payments and thus focuses on the transaction demand for cash. Therefore, the two main outcome variables – *Cash Holdings Amount* and the corresponding dummy *Cash Holdings* – both measure transaction holdings of cash used for legal purchases and transfers from one consumer to another.

The SCPC asked subjects about on-person cash holdings, "About how much cash do you have in your wallet, purse, and/or pocket?", as well as about cash hoarding, "About how much cash do you have stored elsewhere for safekeeping in your home, car, office, etc.?".[22] I only use the on-person cash holdings. Cash holdings in consumers' pockets might be subject to measurement error: consumers might hold cash not to spend it for immediate consumption, but to conduct non-point-of-sale payments (e.g., recurring bills) or even to hoard cash. To mitigate measurement error, following Greene et al. (2016), I exclude the top 1% of observations of very large-value holdings (more than USD 600). 86% of U.S. consumers carry some cash with them, and on average it amounts to USD 64 (median USD 25) (Table 3). Moreover, there is substantial variation in cash holdings across consumers (Figure 2).

3.3 Explanatory variables

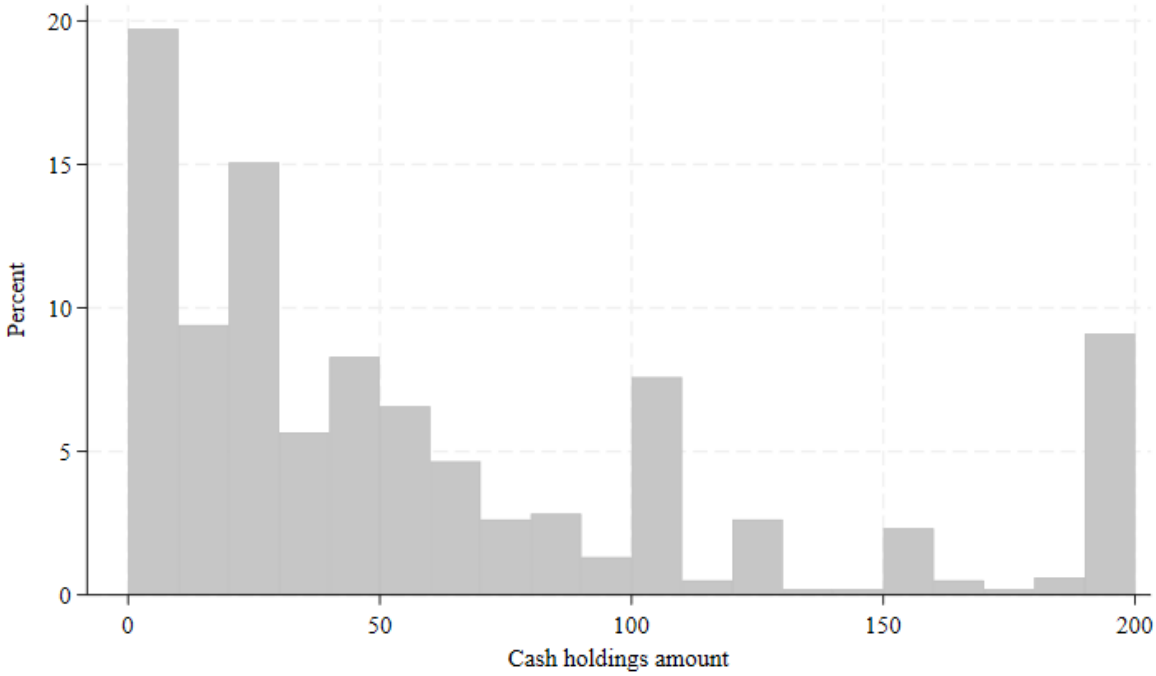
The main explanatory variables are *Risk Aversion*, which I use to test my first hypothesis (H1), and *Probability Weighting*, which I use to test my second hypothesis (H2). Disentangling these two constructs is empirically challenging because preferences are determined by the joint product of risk aversion and probability weighting, both typically nonlinear. Dimmock et al. (2021)[23] adopt a nonparametric approach in which four incentivized questions are used to

[21] Furthermore, transactional cash holdings can be used in the shadow economy as well as in the legal economy. While I cannot distinguish between both motives, it is unlikely that respondents report cash holdings for illegal reasons. In recent years, there has been a debate about abolishing large denomination currency notes to counter crime, tax evasion and to allow for negative interest rates (Rogoff, 2017). For instance, in 2014, the European Central Bank announced that national central banks will cease distributions of EUR 500 bills after 2018 and India carried out a banknote demonetization in 2016.

[22] The questionnaire can be found here.

[23] Dimmock et al. (2021) denote risk aversion stemming from the curvature of the utility function with the term "utility curvature," as risk preferences in Prospect Theory are jointly determined by utility curvature and

Figure 2: Distribution of cash holdings on-person in the U.S. sample



This figure shows the average on-person cash holdings (excluding the top 1% of observations of very large-value holdings) in USD 10 bins. Amounts larger than USD 200 are summarized in one bin. The sample size is $N = 989$. Data source: RAND American Life Panel.

measure risk aversion (utility curvature) and six incentivized questions to measure probability weighting.[24,25] The correlation between *Risk Aversion* and *Probability Weighting* is small (Pearson correlation coefficient $\rho = 0.07^{**}$; Figure 3 and Table A3), indicating that the two measures capture distinct preference components.

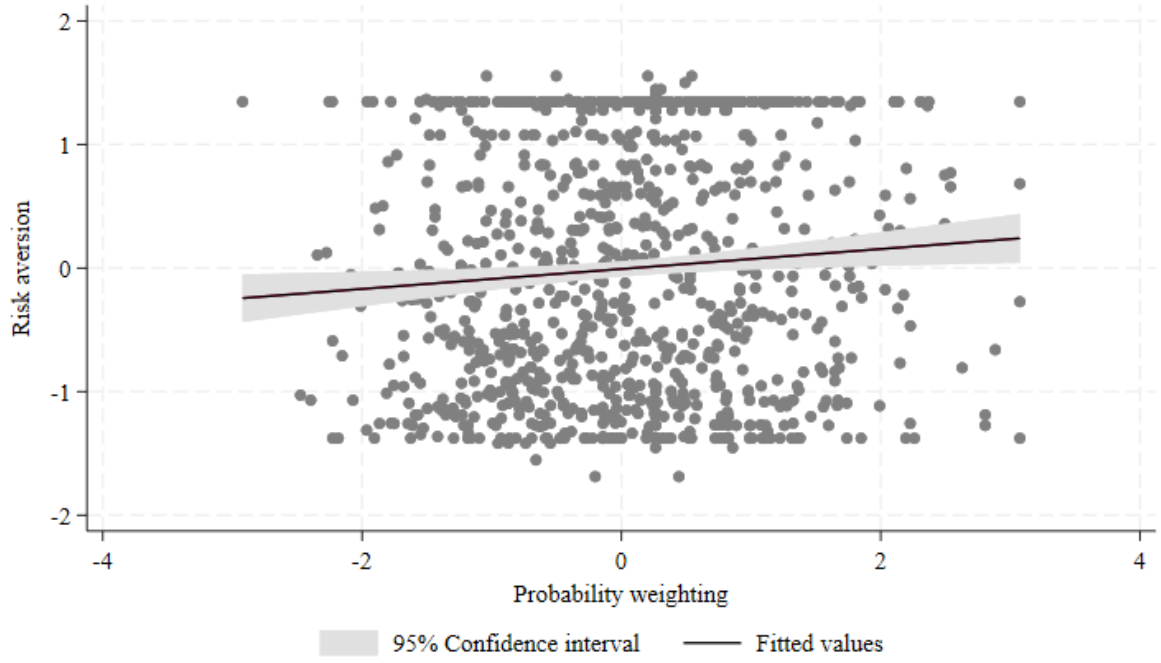
Table 3 summarizes the measures of risk aversion and probability weighting. *Risk Aversion* is defined as the average risk premium required for the four utility curvature lottery questions (Appendix A.2) and has a mean of 0.12, with positive values indicating risk aversion and higher values reflecting more pronounced risk aversion. *Probability Weighting* is elicited using six questions, each consisting of three rounds that present a choice between a high-probability payout of small sums of money and a low-probability payout of larger sums (Appendix A.3). Higher values indicate stronger probability weighting. Consistent with findings for the general population, the average sum of risk premiums for the three high-probability questions is 74

probability weighting. I do not follow their wording.

[24] See Dimmock et al. (2021) for a detailed discussion and comparison to parametric methods (e.g., Tanaka et al., 2010, Erner et al., 2013) and to alternative nonparametric methods that rely on extensive chaining of questions (e.g., Wakker and Deneffe, 1996, Abdellaoui, 2000, Van De Kuilen and Wakker, 2011).

[25] Appendix A.2 and Appendix A.3 summarize the elicitation procedures.

Figure 3: Risk aversion and probability weighting



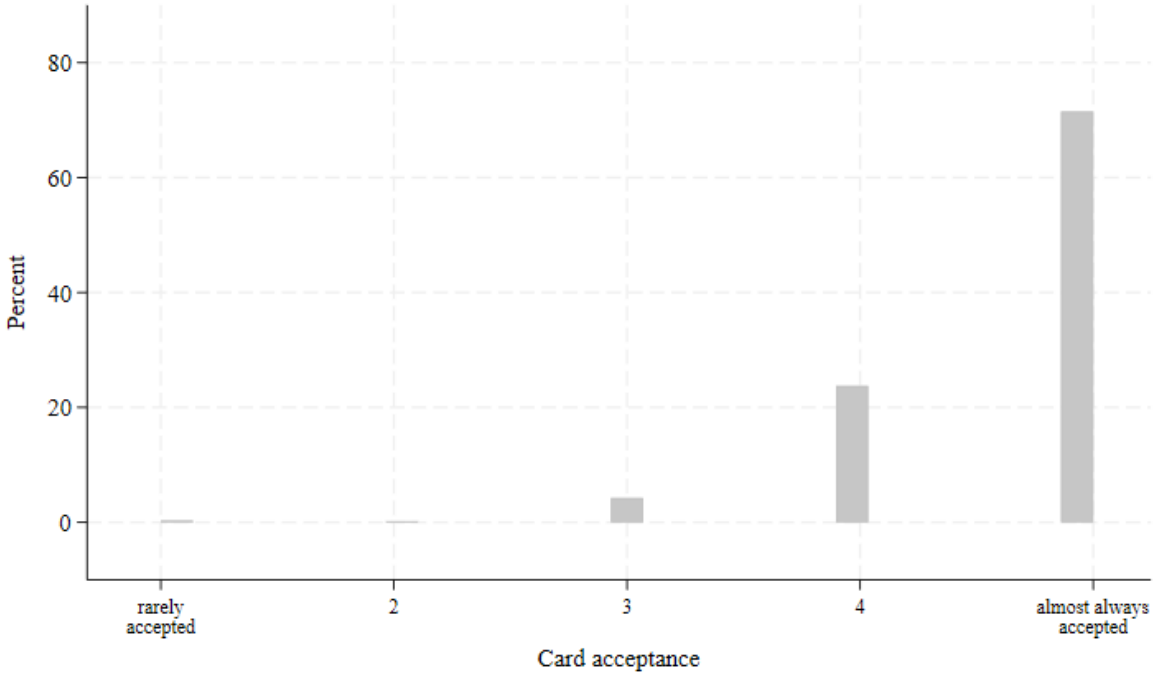
This figure shows the distribution and correlation (Pearson's correlation 0.07**) between the two components of risk attitudes – risk aversion and probability weighting. Both variables are standardized. The sample size is N = 989. Data source: RAND American Life Panel.

percentage points higher than the sum for the three low-probability questions. Moreover, 80% of respondents have a positive measure, indicating an inverse-S-shaped probability weighting function in line with previous findings (e.g., Abdellaoui, 2000, Bruhin et al., 2010). There is substantial heterogeneity in both risk aversion (SD = 0.25) and probability weighting (SD = 0.79), which may help explain the considerable heterogeneity in cash holdings observed across individuals (Table 3).

To test my third hypothesis (H3), I use a direct measure of subjective beliefs about the acceptance of debit and credit cards at the point of sale. Respondents rate how likely they think each instrument is "accepted for payment by stores, companies, online merchants, and other people or organizations." The response scale is a five-point Likert scale ranging from 1 ("rarely accepted") to 5 ("almost always accepted"). My explanatory variable *Card Acceptance* is defined as the higher of the two ratings (credit or debit card). A large majority (72%) rate either credit or debit card acceptance as very high, with a mean rating of 4.64 (Figure 4).[26]

[26]Therefore, in my regression analysis, I include a dichotomized version of this variable, *High Card Acceptance*, which takes the value one if a consumer rates either debit or credit cards in the highest category of acceptance ("almost always accepted"). This variable was not preregistered.

Figure 4: Beliefs about credit and debit card acceptance at the point of sale in the U.S. sample



This figure shows the distribution of the answers to the question: "Please rate how likely credit/debit card is to be accepted for payment by stores, companies, online merchants, and other people or organizations." The 5-point Likert scale ranges from 1 = "rarely accepted" to 5 = "almost always accepted." The sample size is $N = 989$. Data source: RAND American Life Panel.

3.4 Control variables

Behavioral control variables

It is possible that probability weighting is correlated with other components of a consumer's utility function, reflects a cognitive bias, or is better explained by specific consumer characteristics. Therefore, following Dimmock et al. (2021), I include a set of behavioral control variables – *Education*, *Financial literacy*, *Numeracy*, and *Trust* – in my baseline specification to mitigate potential omitted variable bias from factors conceptually close to probability weighting. I further add the behavioral controls *Optimism*, *Overconfidence*, *Loss aversion*, and *Ambiguity aversion* as potential alternative explanations that might otherwise be captured by *Probability Weighting*.[27,28]

[27]For example, when individuals overweight the probability of experiencing losses (probability weighting) and also strongly prefer avoiding losses over acquiring gains (loss aversion), they are likely to exhibit a more pronounced aversion to risky options.

[28]However, because I source *Optimism*, *Overconfidence*, *Loss aversion*, and *Ambiguity aversion* from additional RAND ALP surveys, including all these controls simultaneously reduces my sample to 89 observations. Therefore, I run separate subsample regressions when adding these variables (Table A8).

First, trust and probability sophistication (proxied by *Education*, *Numeracy*, and *Financial Literacy*) may explain the observed likelihood insensitivity. Probability sophistication refers to the ability to correctly assess probabilities and think quantitatively. Yet these alternative constructs are only weakly correlated with risk attitudes (Table A3), and Dimmock et al. (2021) note that it is ex ante unclear how they could generate the observed pattern of risk premiums.

Second, optimism or overconfidence may cause respondents to overweight the probability of obtaining larger prizes and underweight the probability of smaller prizes, regardless of the objective probabilities (Trautmann and Van De Kuilen, 2015). In the real-life context I study, consumers would be overly optimistic (or overconfident) that card payments will always be accepted. However, both *Optimism* and *Overconfidence* are only weakly correlated with my explanatory variables (Table A3).

Third, probability weighting might reflect other components of a consumer's utility function, such as domain-specific risk attitudes like loss aversion[29]. Although both probability weighting and loss aversion are integral to Prospect Theory (Tversky and Kahneman, 1992), they represent distinct psychological phenomena with different underlying mechanisms. Both may contribute to heightened risk aversion for gains (Prelec, 1998), but my probability weighting measure is unlikely to capture loss aversion (or general risk aversion). This is because these constructs cannot explain the simultaneous negative risk premiums for low probabilities and positive risk premiums for high probabilities observed for the same individual in the data[30]. Moreover, the correlation between probability weighting and loss aversion is not significant (Table A3).

Fourth, I consider ambiguity aversion, elicited by Dimmock et al. (2016) in 2012 and by Stango et al. (2017) in 2017 (*Ambiguity aversion dummy*). Ambiguity-averse consumers prefer known risks to unknown risks. The context of cash acceptance, like most real-world outcomes, is better described as a setting of unknown risks; thus ambiguity aversion could well influence consumers' cash holdings. Moreover, probability weighting extends to ambiguous settings and tends to be more pronounced in them (Tversky and Fox, 1995). Thus, *Probability Weighting* elicited with known probabilities may underestimate actual behavior in settings involving real-world uncertainty. However, the observed association between ambiguity aversion and risk attitudes is small (Table A3).

[29] I consider loss aversion elicited in the RAND ALP by Choi and Robertson (2020) in 2016 (*Loss aversion*) and by Stango et al. (2017) in 2017 (*Loss aversion dummy*).

[30] For a detailed discussion, see Internet Appendix D of Dimmock et al., 2021.

Socioeconomic control variables

Empirical models of cash use typically control for transaction characteristics (e.g., purchase amount, channel, merchant category) and payer characteristics (e.g., age, gender). Prior research finds that the share of cash payments generally increases with age, a preference for anonymity, among consumers living in rural areas, and with a desire for record keeping of expenses, while it decreases with education and income (for a review, see Shy, 2023). Because cash use and cash holdings are closely related (e.g., Arango et al., 2015, Bouhdaoui and Bounie, 2012), I include the following socioeconomic controls: *Age*, *Gender*, *Marital status*, *Race*, *Ethnicity*, *Number of household members*, *Labor force status*, *Family income*, *Financial wealth*, and *Housing wealth* (see Table 3 for summary statistics).

4. Risk attitudes and cash holdings

I first document the unconditional association between risk attitudes and the amount of cash carried (Figure 5). The y-axis shows the natural logarithm of the amount of *Cash Holdings*, and the x-axis shows the *Risk Aversion* measure (Panel A) and the *Probability Weighting* measure (Panel B). Both fitted lines are flat, indicating that neither greater aversion to risk nor greater distortion of beliefs is associated with the amount of cash in the pockets of respondents.

This result is confirmed (Table 4)[31] when I estimate the following regression specification using ordinary least squares:

$$\begin{aligned} Y_i = \beta_0 + \beta_1 \cdot \textit{Risk Aversion}_i + \beta_2 \cdot \textit{Probability Weighting}_i \\ + \beta_3 \cdot \textit{High Card Acceptance}_i + \beta_4 \cdot X_i + \beta_5 \cdot Z_i + \varepsilon_i \end{aligned} \tag{1}$$

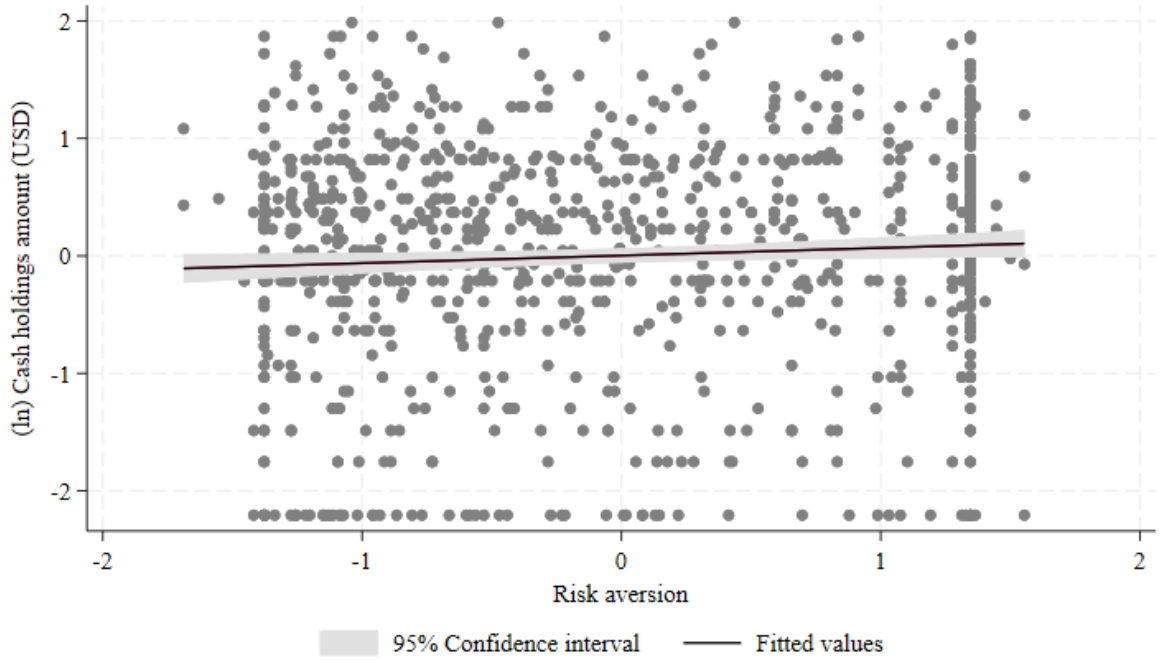
where Y_i is one of my two outcome variables *Cash Holdings* and *Cash Holdings Amount* for consumer i. X_i represents a set of behavioral control variables (*Education*, *Financial literacy*, *Numeracy*, *Trust*, *Optimism*, *Overconfidence*, *Loss Aversion*, *Ambiguity Aversion*). Z_i is a vector of socioeconomic control variables: 5-year *Age* category dummies, *Female*, *Married*, *White*, *Hispanic*, log(*Number of household members*), *Employed*, log(*Family income*), log(*Financial wealth*), log(*Housing wealth*).[32] However, there is indicative evidence that being very young and very old, and having stronger numeric skills is associated with larger cash holdings, while being a woman and having higher financial wealth is associated with lower cash holdings (Table A8).

[31] Because there is little variation at the extensive margin, I report intensive margin results in the main text. Full results, including extensive margin estimates, are provided in Table A8.

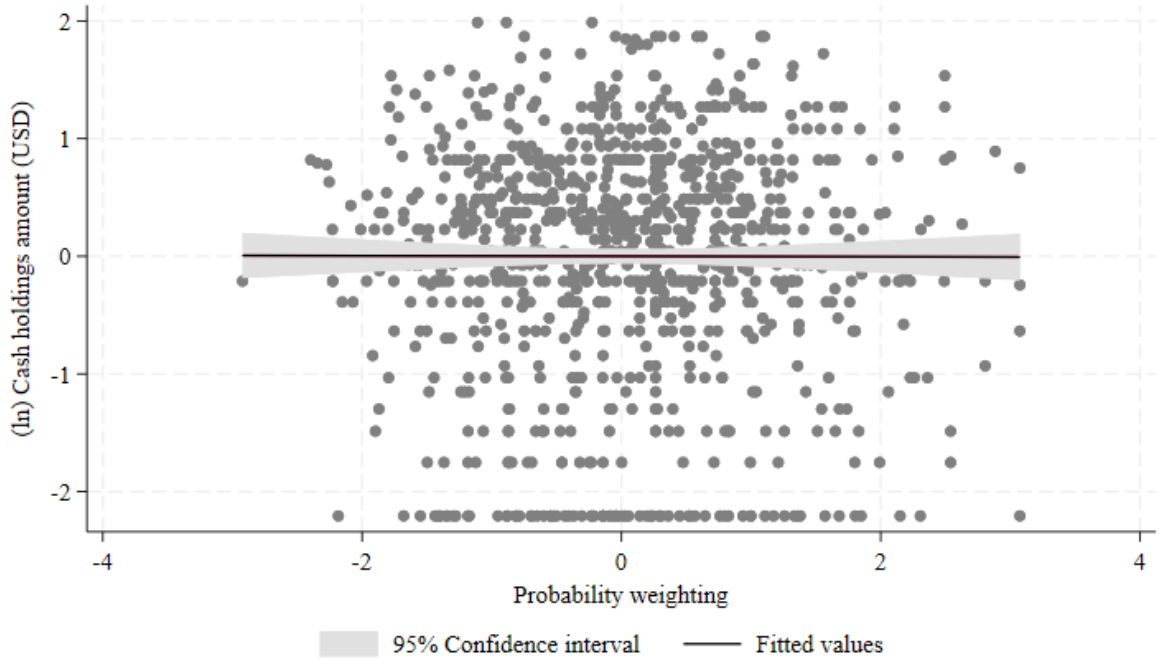
[32] Contrary to the preregistered specification, I do not use county dummies to control for variation in shop availability, terminal density, and ATM density (supply-side controls) due to data availability. In addition, I deviate from the pre-analysis plan using a dichotomized version of *Card Acceptance*, namely *High Card Acceptance*. Furthermore, I incorporate interaction terms between *Risk Aversion* / *Probability Weighting* and *High Card Acceptance*, and estimate regressions with robust standard errors. Finally, I account for multiple hypothesis testing by adjusting inference tests using the correction method proposed by Olken (2015).

Figure 5: Risk attitudes and cash holdings

Panel A. Risk aversion



Panel B. Probability weighting



This figure displays the association between the amount of cash holdings and risk aversion (Panel A) and probability weighting (Panel B). All variables are standardized. The sample size is $N = 989$. Data source: RAND American Life Panel.

Table 4: Risk attitudes and cash holdings

	Full sample		**Card payers**	
	Cash Holdings Amount		ln*(Cash Holdings Amount)*	
	(1)	(2)	(3)	(4)
Risk Aversion				
Quartile 2	−0.359	0.132	−0.455	−0.207
	(0.267)	(0.505)	(0.284)	(0.542)
Quartile 3	−0.397	0.348	−0.536*	−0.225
	(0.287)	(0.597)	(0.297)	(0.578)
Quartile 4	−0.165	0.376	−0.168	0.084
	(0.310)	(0.599)	(0.330)	(0.675)
Probability Weighting	−0.134	0.172	−0.143	0.165
	(0.096)	(0.207)	(0.097)	(0.203)
High Card Acceptance	0.221	0.854**	0.208	0.514
	(0.228)	(0.373)	(0.235)	(0.417)
Education	0.043	0.007	0.169	0.144
	(0.143)	(0.142)	(0.145)	(0.149)
Financial literacy	−0.008	0.001	−0.082	−0.070
	(0.129)	(0.121)	(0.127)	(0.124)
Numeracy	0.350***	0.335***	0.312**	0.295**
	(0.121)	(0.119)	(0.127)	(0.128)
Trust	−0.175	−0.157	−0.221*	−0.208*
	(0.114)	(0.114)	(0.115)	(0.118)
Interaction terms	No	Yes	No	Yes
Socioeconomic control variables	Yes	Yes	Yes	Yes
Behavioral control variables	No	No	No	No
Observations	989	989	890	890
Mean of dependent variable	3.371	3.371	3.343	3.343
Adjusted R^2	0.214	0.230	0.228	0.236

This table reports OLS regression results for subgroups of the U.S. sample. The dependent variable is ln(*Cash Holdings Amount*). Robust standard errors are reported in parentheses. All columns include socioeconomic controls for *Female*, 5-year *Age* category dummies, *Married*, *White*, *Hispanic*, ln(*Number of household members*), *Employed*, ln(*Family income*), ln(*Financial wealth*), and ln(*Housing wealth*). All nonbinary independent variables are standardized. All results use post-stratification weights. Data source: RAND American Life Panel.

*$p < .05$; **$p < .01$; ***$p < .001$.

In a second step, I re-estimate the regression for a subsample of 890 consumers who rarely use cash (those who conduct more than 50% of transactions with a debit or credit card) and for a non-preregistered, stricter subsample of 117 consumers who pay exclusively by card. The aim of this exercise is to separate the risk-hedging function of cash holdings for unexpected and rare occasions of card non-acceptance from carrying cash for intended regular payment use. Furthermore, this allows me to rule out that my results, particularly regarding the amount of cash holdings, are driven by so-called "pocket watchers." These individuals pay predominantly with cash to monitor their budget and have been found in previous studies to carry larger cash balances than the average consumer (Von Kalckreuth et al., 2014, Van der Cruijsen et al., 2017, Ebner et al., 2021). The results remain unchanged (Table 4).

In additional non-preregistered analyses that add payment method characteristics (in particular, respondents' rating of cash as facilitating record keeping), I confirm the null findings (Table A16). I also show in further subsample regressions that the results are not driven by probability unsophistication (low education, low numeracy, or low financial literacy) (Table A11), nor do risk attitudes affect cash holdings for consumer groups typically associated with cash use (low income, elderly, those who rate cash as helpful for record keeping, or those who value cash for convenience) (Table A11).[33]

One potential explanation for the null findings is that Dimmock et al. (2021) elicit risk attitudes in terms of lotteries rather than natural events. This approach has the advantage of measuring preferences over probabilities rather than beliefs about probabilities (Barberis, 2013), but it also has the disadvantage that decisions are context dependent (e.g., Weber et al., 2002, Hanoch et al., 2006). For transactional cash holdings, the risk of forgoing consumption is not the same as the risk of winning or losing money in a lottery.

Another explanation for the null findings could be data quality issues. To assess this, I rerun my analyses on a subsample of consumers for whom I have information on cash use, i.e., payment diary data from the 2012 Diary of Consumer Payment Choice (Greene et al., 2018). In these data, the cash share of expenses in both value and volume terms decreases with income, consistent with previous research (Table A10). However, these shares do not increase consistently with age, and education is not significantly associated with cash use, which may

[33]Using the Swiss sample, I examine whether cash holdings are related to consumers' broader demand for liquidity, measured by the share of wealth held in bank deposits. Appendix B.7 shows that this analysis does not support a precautionary liquidity motive for cash; if anything, the relationship is weakly negative.

indicate noise in the data (Shy, 2023). Therefore, I confirm the null findings using (i) a second dataset of Swiss insurance clients, for which there is less indication of data-quality concerns (Section 5), and (ii) data from the 2020 Swiss National Bank's Payment Methods Survey of Private Individuals (SNB, 2020) (Appendix C).

4.1 Robustness tests

I conduct a series of preregistered robustness checks to examine whether the main findings are sensitive to alternative sampling criteria (i), different specifications of outcome (ii) and explanatory variables (iii), or alternative estimation methods (iv) (Table A12).

First, using a stricter sampling rule that excludes inattentive respondents does not alter the results (Table A13).[34] Second, when considering alternative outcome measures – such as including on-property cash holdings or large-value cash holdings – the results remain unchanged (Table A13). Third, I re-estimate the models using alternative explanatory variables. Instead of the incentivized measure of *Risk Aversion*, I employ two self-reported measures of risk preferences (general and financial) as well as the Barsky et al. (1997) risk measure; and instead of only debit and credit cards, I also consider prepaid cards (Table A14). In addition, I use parametric measures of *Probability Weighting* preferences in place of the nonparametric measure (Table A15).[35] My results remain nonsignificant when I rerun the baseline analysis using these parametric measures of probability distortions. Fourth, the results are robust to alternative estimation methods: a Tobit model, given that *Cash Holdings Amount* is bounded at zero, and a logit model for the dichotomous outcome variable *Cash Holdings*, both confirm the main findings (Table A13).

In additional non-preregistered robustness checks, I extend the analysis along three dimensions (Table A16). First, I add controls for payment method characteristics beyond acceptance (*Acquisition and Setup*, *Convenience*, *Cost*, *Payment records*, *Security*). Contrary to earlier evidence that these perceptions matter for payment choice (e.g., Arango et al., 2011, Borzekowski and Kiser, 2008, Schuh and Stavins, 2010, Stavins, 2017), I find no association with cash

[34] I exclude respondents who performed poorly on the consistency check questions of the risk aversion and probability weighting measures.

[35] The correlations between the nonparametric measure and the parametric measures proposed by Prelec (1998), Tversky and Kahneman (1992), and Bordalo et al. (2013) are 0.72, 0.55, and 0.74, respectively. See Table A2 for summary statistics. More details about the estimation of these measures are provided in Dimmock et al. (2021), Online Appendix F.

holdings. Second, I control for spending, either by expressing cash holdings as a share of total expenditure or by including spending directly as a regressor; the results remain unchanged. Third, I examine whether safety concerns might influence consumers' cash holdings. Neither having cash stolen or lost in the last 12 months reduces the likelihood of carrying cash, nor does a negative experience with card use increase cash holdings. This contrasts with the extensive evidence of experience effects in other domains of household financial decision-making (Malmendier, 2021). My main hypothesis is that probability weighting increases cash holdings because individuals overweight the small probability of not being able to pay by card (H2). However, an alternative mechanism is also conceivable: consumers with strong probability weighting may overestimate the small probability of being mugged or having their cash stolen, which could instead lead them to carry less cash. This opposing channel is important to keep in mind when interpreting the results.

5. Risk attitudes, preferences for early resolution of uncertainty, and cash holdings

5.1 Swiss sample

The data are drawn from an observational cross-sectional experiment conducted in 2023 among customers of a large Swiss primary insurance company. The final sample consists of 1'666 respondents. To be eligible for the web-based study, participants had to meet the following criteria: (i) be between 22 and 70 years of age, (ii) currently reside in Switzerland, (iii) provide informed consent to participate, (iv) be able to understand study instructions and the consent formulation in either German, French, or Italian, and (v) hold insurance coverage for household contents, private liability, and motor insurance with the insurer[36]. Participants received a fixed payment of CHF 10 for participation. In addition, they could earn up to CHF 544 (CHF 35 on average) conditional on chance as well as on their decisions in the incentivized choice situations.

5.2 Variables

Three types of data are collected. First, incentivized decisions on economic choices are used to construct proxies for my main independent variables: *Risk aversion* and preferences for the timing of resolution of uncertainty (*Early resolution of uncertainty*), with underlying motives (*Early resolution of uncertainty – negative emotion*, *Early resolution of uncertainty – positive emotion*, *Early resolution of uncertainty – planning*)[37]. Second, I collect non-incentivized survey responses, from which I obtain information on respondents' payment behavior as well as most control variables. Third, I draw on administrative data on real-world insurance choices and claims, which also provide socioeconomic information, notably place of residence (Table B1).[38]

As in the main analysis of the U.S. sample, the two outcome variables are *Cash Holdings Amount* and the corresponding dummy *Cash Holdings*. Again, I exclude the top 1% of observations of very large-value holdings. In this sample, 95% of Swiss consumers carry some cash, with an average of CHF 94 (median CHF 80) (Table B2).[39] Moreover, similar to the U.S.

[36] For more information on the recruitment procedure, see Biener and Epper (2023).

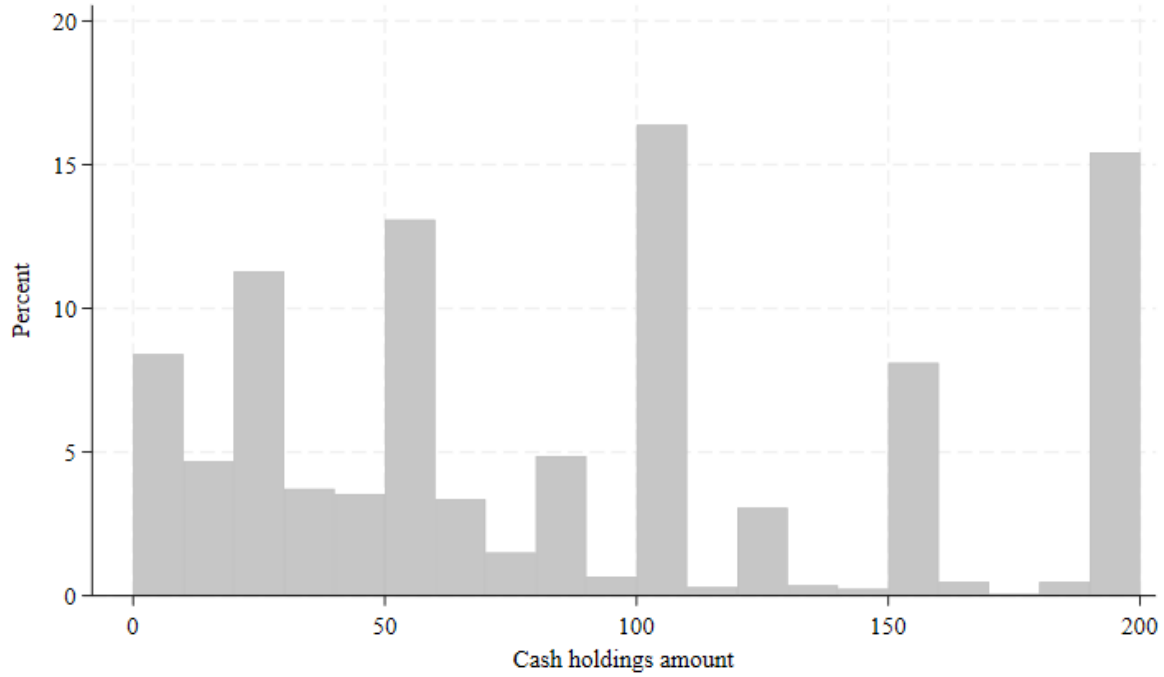
[37] I provide a summary of the elicitation procedure in Appendix B.3.

[38] Appendix B.1 defines the variables and provides summary statistics for all variables used.

[39] This is in line with the 2022 Swiss National Bank's Payment Methods Survey of Private Individuals, which reports that Swiss consumers carry on average CHF 132 (median CHF 86) in cash.

data, there is substantial variation in cash holdings across consumers, albeit at higher levels (Figure 6).

Figure 6: Distribution of cash holdings on-person in the Swiss sample



This figure shows the average on-person cash holdings (excluding the top 1% of observations of very large-value holdings) in CHF 10 bins. Amounts larger than CHF 200 are summarized in one bin. The sample size is $N = 1'666$. Data source: Swiss sample.

The explanatory variables are *Risk Aversion*, a rank measure of a respondent's risk aversion relative to other individuals in the sample, and *Early Resolution of Uncertainty* (Caplin and Leahy, 2001). At the conclusion of the survey, participants could choose to resolve uncertainty regarding their payment amount for participating in the study immediately, or wait two weeks. Knowing the earned prize money and thus resolving the uncertainty immediately came at a cost of CHF 2 (5% of the average payout of CHF 38). Importantly, the timing of the decision did not affect the actual payout date. In total, 33% of consumers opted for early resolution of uncertainty.

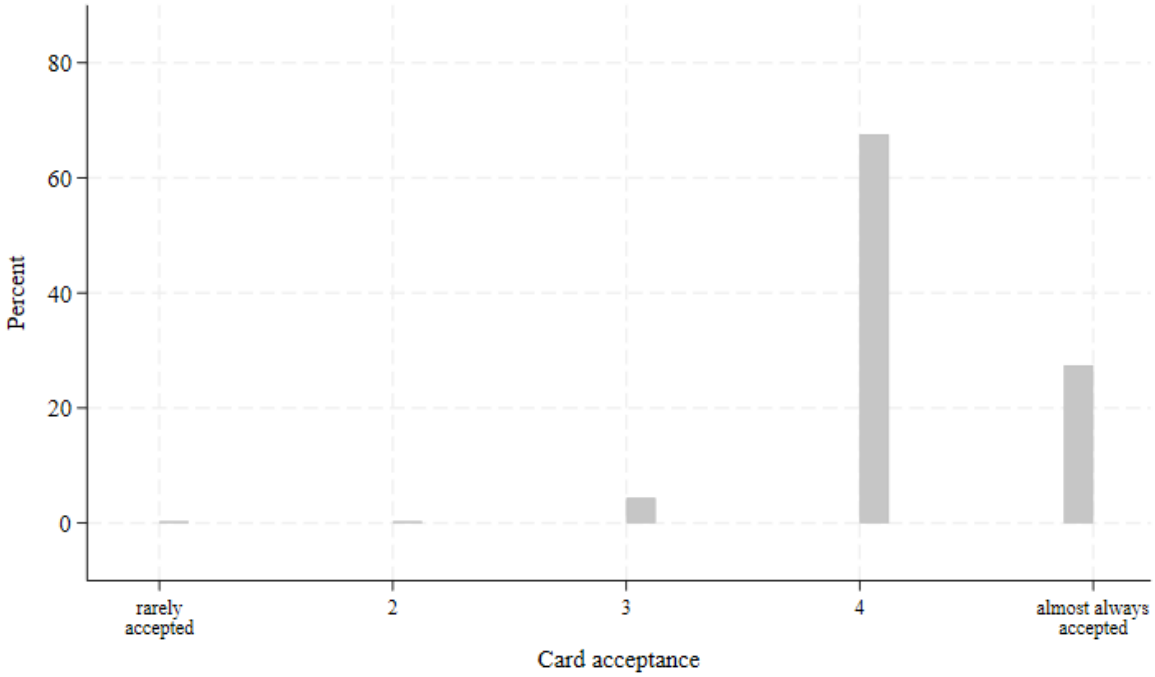
In addition, I elicited respondents' motives for choosing early or late resolution of uncertainty (Kocher et al., 2014). Specifically, participants rated on a 10-point Likert scale the importance of three potential motives: *negative emotions*, *positive emotions*, and *planning*[40]. The most frequently cited motive for choosing early resolution of uncertainty was *positive*

[40] I then construct dummy variables for each motive, coded as one if the respondent rated the motive above 4.

emotion (Figure B2).

To test my third hypothesis (H3), *Card Acceptance* is, as in the main analysis, a direct measure of subjective beliefs about the acceptance of debit and credit cards at the point of sale. The mean rating of 4.22 is high (Figure 7), and similar to the U.S. sample (4.64) (Figure 4).

Figure 7: Beliefs about credit and debit card acceptance at the point of sale in the Swiss sample



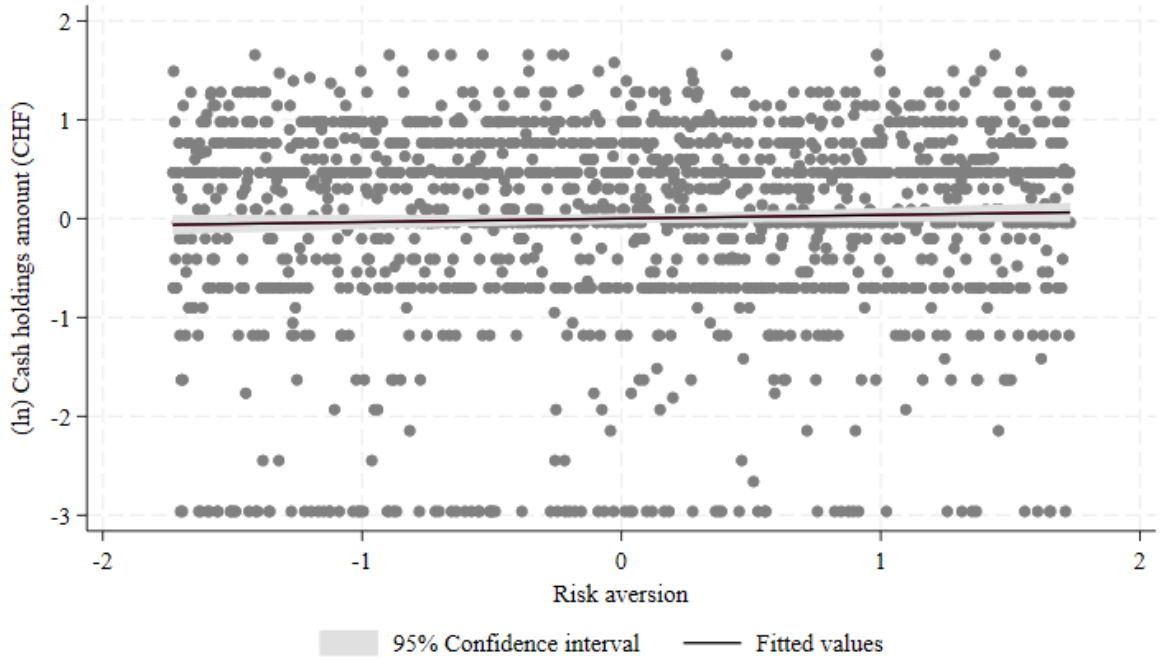
This figure shows the distribution of the answers to the question: "Please rate how likely credit/debit card is to be accepted for payment by stores, companies, online merchants, and other people or organizations." The 5-point Likert scale ranges from 1 = "rarely accepted" to 5 = "almost always accepted." The sample size is $N = 1'666$. Data source: Swiss sample.

5.3 Empirical results

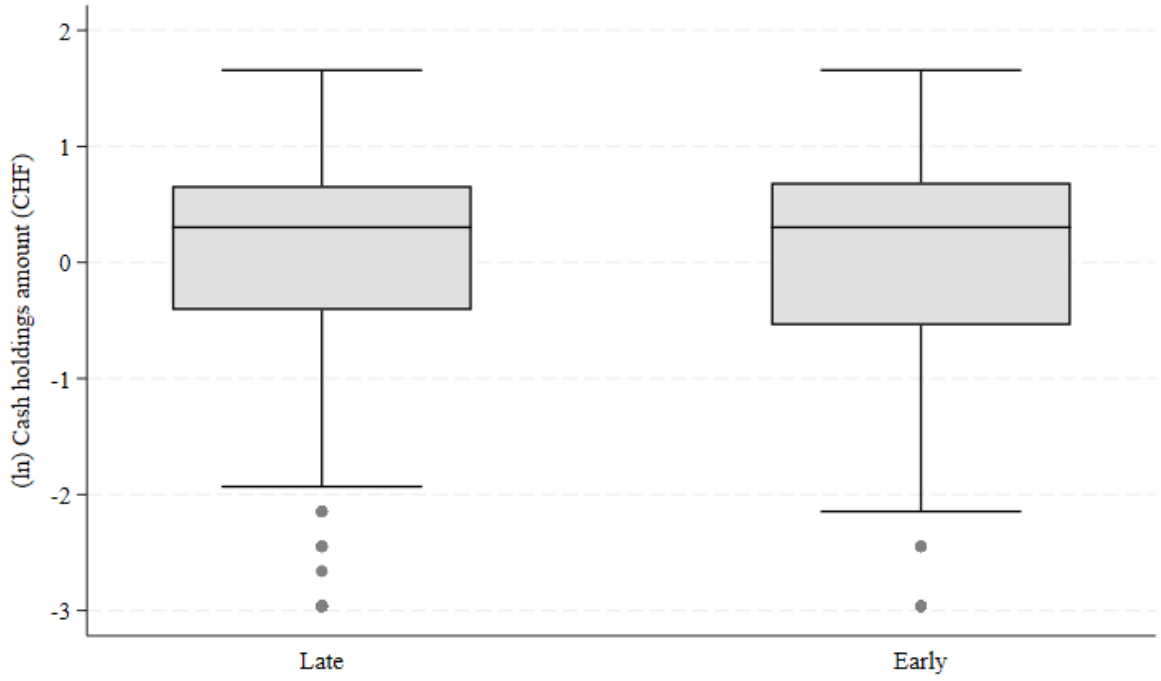
Figure 8 provides a visual summary of the relationship between risk aversion, preferences for early resolution of uncertainty, and cash holdings. The y-axis shows the natural logarithm of cash holdings, while the x-axis shows the risk measure (Panel A) and the early resolution of uncertainty measure (Panel B). In both panels, the fitted curves are flat, indicating that neither stronger risk aversion nor a greater preference for early resolution of uncertainty is associated with the amount of cash respondents carry.

Figure 8: Cash holdings, risk aversion, and preferences for early resolution of uncertainty

Panel A. Risk aversion



Panel B. Resolution of uncertainty



This figure displays the association between the amount of cash holdings and risk aversion (Panel A) and a preference for early resolution of uncertainty (Panel B). All nonbinary variables are standardized. The sample size is $N = 1'666$. Data source: Swiss sample.

This result is confirmed when I estimate the following regression specification using the ordinary least squares method (Table 5):

$$\begin{aligned} Y_i = \beta_0 + \beta_1 \cdot \textit{Risk aversion}_i + \beta_2 \cdot \textit{Card acceptance}_i + \beta_3 \cdot PERU_i \\ + \beta_4 \cdot X_i + \beta_5 \cdot Z_i + \beta_6 \cdot L + \varepsilon_i \end{aligned} \tag{2}$$

where Y_i is one of my two outcome variables, *Cash Holdings* or *Cash Holdings Amount*, for consumer i. $PERU_i$ refers to my measures of preferences for the timing of the resolution of uncertainty and its associated motives (*Early resolution of uncertainty*, *Early resolution of uncertainty – negative emotion*, *Early resolution of uncertainty – positive emotion*, *Early resolution of uncertainty – planning*). X_i represents a set of behavioral control variables (*Mood* and *Patience*.)[41]. Z_i is a vector of socioeconomic control variables: *Age*, *Female*, *Married*, ln(*Number of children*), *Employed*, ln(*Income*), ln(*Financial wealth*), ln(*Housing wealth*), ln(*Housing space*), *Liquidity constrained*, *Education*, *Language region*, and *Rural*. Finally, L is a set of labor market area dummies to control for variation in shop availability, terminal density, and ATM density (supply-side controls).[42]

Table 5 presents the regression results. Like in my main analysis of the U.S. sample, risk aversion is not associated with cash holdings, neither at the extensive nor at the intensive margin (H1). The data therefore do not confirm that precautionary motives explain cash holdings. Furthermore, the results do not indicate that holding cash provides "peace of mind" by resolving the worry immediately about not being able to pay at a shop later in time (H4). Disconfirming H5, consumers with a preference for early resolution of uncertainty are more likely to state that negative emotions – i.e., anticipatory anxiety or worry – drive their decision, but they are less likely to carry cash (Table B5). In contrast to the U.S. data, subjective beliefs about card acceptance are consistently and significantly associated with cash holdings, confirming hypothesis H3. These results are robust in subsamples of cash users or respondents who correctly answered an attention check (Table B7).

Across specifications, I also find that more patient consumers tend to hold less cash, which may reflect that they are either less concerned about the risk of a foregone consumption opportunity and thus more prone to shop around (Telyukova, 2013), or that less patient consumers

[41] Further preregistered control variables (*Index of decision-making quality*, *Disappointment aversion*) are not added in this analysis.

[42] 16 large labor market areas as defined by the Swiss Federal Statistical Office (2018).

use cash as a tool to discipline their spending (Brown et al., 2023).

Concerning data quality, family income and education are again not consistently negatively associated with cash holdings. By contrast, the point estimates of financial wealth, liquidity constraints, and rural residence are consistently and significantly associated with the amount of cash holdings, in line with previous findings in the literature (Shy, 2023). Moreover, there is a clear age gradient, with higher cash holdings among older adults (Table B3). I am therefore confident that these are true null findings.

Table 5: Cash holdings, risk aversion, and preferences for early resolution of uncertainty

	Full sample		**Card payers**	
	ln(*Cash Holdings Amount*)		ln(*Cash Holdings Amount*)	
	(1)	(2)	(3)	(4)
Risk Aversion	0.032	0.032	0.077*	−0.046
	(0.032)	(0.113)	(0.043)	(0.176)
Early resolution of uncertainty	−0.012	−0.346	0.013	−0.633*
	(0.068)	(0.243)	(0.094)	(0.384)
High Card Acceptance	−0.256**	−0.376***	−0.245	−0.494***
	(0.111)	(0.124)	(0.176)	(0.173)
Mood	0.019	0.020	−0.010	−0.010
	(0.032)	(0.032)	(0.045)	(0.045)
Patience	−0.073**	−0.073**	−0.080*	−0.081*
	(0.032)	(0.032)	(0.043)	(0.043)
Interaction terms	No	Yes	No	Yes
Behavioral control variables	Yes	Yes	Yes	Yes
Socioeconomic control variables	Yes	Yes	Yes	Yes
Labor market area controls	Yes	Yes	Yes	Yes
Observations	1'666	1'666	1'014	1'014
Mean of dependent variable	3.99	3.99	3.720	3.720
Adjusted R^2	0.139	0.139	0.143	0.142

This table reports OLS regression results for the full sample and for a subsample of people who indicated that they mostly pay by card. The dependent variable is ln(*Cash Holdings Amount*). Robust standard errors are reported in parentheses. All columns include socioeconomic controls for *female*, 5-year *age category dummies*, *married*, *white*, ln(*number of household members*), *employment status*, ln(*family income*), ln(*financial wealth*), and ln(*housing wealth*), as well as behavioral controls for *mood*. All nonbinary independent variables are standardized. Data source: Swiss sample.

$^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

6. Conclusion

This preregistered study examines whether risk attitudes explain persistent cash holdings. Using two representative datasets – the RAND American Life Panel (2014 and 2017) and a 2023 survey of Swiss insurance customers – I find no consistent association between cash holdings and risk aversion, probability weighting, or preferences for early resolution of uncertainty. These null results hold across extensive and intensive margins, a range of specifications, and multiple robustness checks, despite average on-person balances of USD 64 in the United States and CHF 94 in Switzerland. The Swiss findings are further corroborated by evidence from the 2020 Swiss National Bank Payment Methods Survey of Private Individuals, which likewise does not support a role for risk aversion in explaining holdings. Taken together, the evidence across two countries (the United States and Switzerland) and three time periods (2014, 2020, and 2023) leads to the conclusion: risk attitudes do not explain cash holdings.

While previous research has shown that risk aversion is a determinant of money demand (Telyukova, 2013), it appears to have little relevance for the cash consumers keep in their wallets. Similarly, probability weighting (Barberis and Huang, 2008, Dimmock et al., 2021) and preferences for early resolution of uncertainty (Caplin and Leahy, 2001, Biener et al., 2024), which have been advanced as behavioral explanations in other financial decisions, fail to account for persistent cash holdings. This points to a gap in our understanding of how consumers manage cash that is not well captured by existing standard or behavioral theories. A promising direction for future research is social household finance, which examines the role of social interactions in financial decisions (Hirshleifer, 2020, Kuchler and Stroebel, 2021). Norms, peer effects, and intra-household dynamics may offer new insights into why consumers continue to carry cash despite declining transactional use.

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Appendix A – U.S. sample

A.1 Definition of variables and summary statistics

Table A1: Definition of variables U.S. sample

Variable	Definition	Unit	Year	Source
Outcome variables				
Cash Holdings Amount	On-person cash holdings, excluding large-value holdings, i.e., total cash holdings of less than or equal to holdings of the 99th percentile	USD	2014	Greene et al. (2016)
Cash Holdings	Dummy variable = 1 if the consumer has on-person cash holdings	[0;1]	2014	Greene et al. (2016)
Alternative outcome variables				
Cash Holdings Amount – all	On-person and on-property cash holdings, excluding large-value holdings, i.e., total cash holdings of less than or equal to holdings of the 98th percentile	USD	2014	Greene et al. (2016)
Cash Holdings Amount – large-value	On-person cash holdings, including large-value holdings	USD	2014	Greene et al. (2016)
Explanatory variables				
Risk Aversion	Average risk premium required for utility curvature lottery questions	number	2017	Dimmock et al. (2021)
Probability Weighting	Nonparametric probability weighting variable Inverse-S: Risk premiums of probability underweighting range (large probability questions) minus risk premiums of probability overweighting range (small probability questions) Inverse-S=(PW88%+PW75%+PW50%)(PW25%+PW12%+PW5%)	number	2017	Dimmock et al. (2021)
Card Acceptance	Beliefs about debit or credit card acceptance at the PoS: 1=”rarely accepted” and 5=”almost always accepted”	[1;..;5]	2014	Greene et al. (2016)
High Card Acceptance*	Dummy variable =1 if consumer rates the acceptance of debit or credit cards as ”almost always accepted” (highest answer option on a five-point Likert scale)	[0;1]	2014	Greene et al. (2016)
Alternative explanatory variables				
Card Acceptance – prepaid	Beliefs about debit, credit card or prepaid card acceptance at the PoS: 1=”rarely accepted” and 5=”almost always accepted”	[1;..;5]	2014	Greene et al. (2016)
Low Card Acceptance	Dummy variable =1 if consumer rates the acceptance of debit or credit cards as ”rarely”, ”occasionally” or ”often” (three lowest answer options on a five-point Likert scale)	[0;1]	2014	Greene et al. (2016)
Low Card Acceptance – prepaid	Dummy variable =1 if consumer rates the acceptance of debit, credit or prepaid cards as rarely, occasionally or often (three lowest answer options on a five-point Likert scale)	[0;1]	2014	Greene et al. (2016)
Risk attitude – general	Self-reported risk attitude: 0=”unwilling to take risks” and 100=”fully prepared to take risks”	[0;..;100]	2017	Stango et al. (2017)

The table shows the definition, unit, year, and source of all variables used in the U.S. sample analysis.

Variable	Definition	Unit	Year	Source
Alternative Probability Weighting definitions				
Inverse-S Rank	Rank variable of Inverse-S	[0,1]	2017	Dimmock et al. (2021)
Above Median Inverse-S Dummy	Dummy variable =1 if Inverse-S is above the median	[0;1]	2017	Dimmock et al. (2021)
Inverse-S Dummy	Dummy variable =1 if Inverse-S is above 25%	[0;1]	2017	Dimmock et al. (2021)
Inverse-S (PW88%+PW75%) – (PW25%+PW12%)	Inverse-S = (PW88%+PW75%) – (PW25%+PW12%)	number	2017	Dimmock et al. (2021)
Inverse-S (PW88% – PW12%)	Inverse-S = PW88% – PW12%	number	2017	Dimmock et al. (2021)
Parametric Probability Weighting measures				
Inverse-S – Prelec	The probability weighting measure, Inverse-S – Prelec, and utility curvature parameter are jointly estimated assuming the functional form for probability weighting in Prelec (1998), equation (3.1) and CRRA utility	number	2017	Dimmock et al. (2021)
Inverse-S – Salience theory	Bordalo et al. (2013), equation (5)	number	2017	Dimmock et al. (2021)
Inverse-S – TK	Tversky and Kahneman (1992) equation (6)	number	2017	Dimmock et al. (2021)
Socioeconomic control variables				
Age	Age of consumer in years	number	2017	Dimmock et al. (2021)
Female	Gender of consumer: 0 = male; 1 = female	[0;1]	2017	Dimmock et al. (2021)
Married	Marital status of consumer: 1 = consumer reports being married or having a partner	[0;1]	2017	Dimmock et al. (2021)
White	Race of consumer: 1 = white, 0 = black, Asian or other	[0;1]	2017	Dimmock et al. (2021)
Hispanic	Ethnicity of consumer: 1 = Hispanic or Latino, 0 = otherwise	[0;1]	2017	Dimmock et al. (2021)
Number of household members	Number of members in the household	number	2017	Dimmock et al. (2021)
Employed	Labor force status of consumer: 1 = employed, 0 = otherwise	[0;1]	2017	Dimmock et al. (2021)
Family income	Total income for all household members older than 15, including from jobs, business, farm, rental, pension benefits, dividends, interest, social security, and other income	USD 1'000	2017	Dimmock et al. (2021)
Financial wealth	The sum of checking and savings account, certificates of deposit (CDs), government and corporate bonds, Treasury bills, and stocks	USD 1'000	2017	Dimmock et al. (2021)
Housing wealth	The value of the primary home	USD 1'000	2017	Dimmock et al. (2021)
No college degree	Education of consumer: 1 = has less than a Bachelor's or Associate's degree, 0 = otherwise (base category)	[0;1]	2017	Dimmock et al. (2021)
Bachelor's or Associate's degree	Education of consumer: 1 = has completed a Bachelor's or Associate's degree, 0 = otherwise	[0;1]	2017	Dimmock et al. (2021)

The table shows the definition, unit, year, and source of all variables used in the U.S. sample analysis.

Variable	Definition	Unit	Year	Source
Control variables (continued)				
Master's or higher degree	Education of consumer: 1 = has completed a Master's degree or higher, 0 = otherwise	[0;1]	2017	Dimmock et al. (2021)
Behavioral control variables				
Financial literacy	Number of financial literacy questions answered correctly out of 3	[0;..;3]	2017	Dimmock et al. (2021)
Numeracy	Number of numeracy questions answered correctly out of 3	[0;..;3]	2017	Dimmock et al. (2021)
Trust	0 = "you can't be too careful" and 5 = "most people can be trusted"	[0;..;5]	2017	Dimmock et al. (2021)
Optimism	Subjective life expectancy minus objective life expectancy	number	2017	Dimmock et al. (2021)
Overconfidence	Overconfidence in performance: self-assessment > actual score. Indicator for overconfidence based on a person's overestimation of their actual performance on three numeric questions (based on Moore and Healy, 2008)	[0;1]	2017	Stango et al. (2017)
Loss aversion	Based on survey question "The possibility of even small losses on my stock investments makes me worry." Ordinal variable ranging from one to five, with higher values indicating greater loss aversion	[1;..;5]	2016	Choi and Robertson (2020)
Ambiguity aversion	Elicited ambiguity aversion. From −0.5 (strongest ambiguity seeking) to +0.5 (strongest ambiguity aversion).	[−0.5, +0.5]	2012	Dimmock et al. (2016)
Alternative behavioral control variables				
Loss aversion dummy	Dummy variable = 1 if consumer rejects one or both of the small-stakes lotteries based on Stango et al. (2017)	[0;1]	2017	Stango et al. (2017)
Ambiguity aversion dummy	Dummy variable = 1 if consumer chooses urn with unknown distribution	[0;1]	2017	Stango et al. (2017)
Non-preregistered control variables				
Acquisition and setup	Dummy variable =1 if consumer rates the use of cash as "very easy to get or set up" (highest answer option on a five-point Likert scale)	[0;1]	2014	Greene et al. (2016)
Convenience	Dummy variable =1 if consumer rates the use of cash as "very convenient" (highest answer option on a five-point Likert scale)	[0;1]	2014	Greene et al. (2016)
Cost	Dummy variable =1 if consumer rates the use of cash as "very low cost" (highest answer option on a five-point Likert scale)	[0;1]	2014	Greene et al. (2016)
Payment records	Dummy variable =1 if consumer rates the use of cash as providing "very good records" (highest answer option on a five-point Likert scale)	[0;1]	2014	Greene et al. (2016)
Security	Dummy variable =1 if consumer rates the use of cash as "very secure" (highest answer option on a five-point Likert scale)	[0;1]	2014	Greene et al. (2016)
Card stolen/lost	Dummy variable =1 if the consumer has had his debit or credit card stolen or lost in the last 12 months	[0;1]	2014	Greene et al. (2016)
Cash stolen/lost	Dummy variable =1 if the consumer has had cash stolen or lost in the last 12 months	[0;1]	2014	Greene et al. (2016)

The table shows the definition, unit, year, and source of all variables used in the U.S. sample analysis.

Table A2: Summary statistics U.S. sample

Variable	Mean	Median	SD	Min	Max	N
Outcome variables						
Cash Holdings Amount	63.87	25.00	93.83	0.00	600.00	989
Cash Holdings	0.86	1.00	0.35	0.00	1.00	989
Alternative outcome variables						
Cash Holdings Amount – all	251.13	75.00	459.33	0.00	3'150.00	946
Cash Holdings Amount – large-value	63.87	25.00	93.83	0.00	600.00	989
Explanatory variables						
Risk Aversion	0.12	0.08	0.25	-0.29	0.54	989
Probability Weighting	0.74	0.82	0.79	-1.54	2.96	989
Card Acceptance	4.64	5.00	0.66	1.00	5.00	989
High Card Acceptance*	0.72	1.00	0.45	0.00	1.00	989
Alternative explanatory variables						
Card Acceptance – prepaid	4.59	5.00	0.68	1.00	5.00	989
Low Card Acceptance	0.16	0.00	0.36	0.00	1.00	989
Low Card Acceptance – prepaid	0.40	0.00	0.49	0.00	1.00	989
Risk attitude – general	55.81	56.00	19.10	0.00	100.00	287
Risk attitude – financial	46.77	50.00	20.68	0.00	100.00	287
Barsky et al. utility curvature	4.18	4.00	1.29	1.00	6.00	316
Alternative Probability Weighting definitions						
Inverse-S Rank	0.54	0.61	0.29	0.00	1.00	989
Above Median Inverse-S Dummy	0.57	1.00	0.50	0.00	1.00	989
Inverse-S Dummy	0.77	1.00	0.42	0.00	1.00	989
Inverse-S (PW 88%+PW 75%) – (PW 25%+PW 12%)	0.53	0.52	0.61	-1.15	2.21	989
Inverse-S (PW 88% – PW 12%)	0.34	0.29	0.38	-0.47	1.21	989
Parametric Probability Weighting measures						
Inverse-S – Prelec	0.14	0.21	0.44	-3.06	0.77	976
Inverse-S – Salience theory	0.65	0.72	0.34	0.00	0.99	985
Inverse-S – TK	0.19	0.30	0.48	-2.44	0.77	976

This table reports summary statistics for the variables used in my study of the U.S. sample. All results use post-stratification weights.

Variable	Mean	Median	SD	Min	Max	N
Socioeconomic control variables						
Age	48.37	47.00	15.35	24.00	91.00	989
Female	0.52	1.00	0.50	0.00	1.00	989
Married	0.59	1.00	0.49	0.00	1.00	989
White	0.64	1.00	0.48	0.00	1.00	989
Hispanic	0.18	0.00	0.38	0.00	1.00	989
Number of household members	2.85	3.00	1.57	1.00	11.00	989
Employed	0.57	1.00	0.50	0.00	1.00	989
Family income	83.03	87.50	55.56	2.50	200.00	989
Financial wealth	62.39	1.00	440.17	0.00	6'021.07	989
Housing wealth	147.51	85.00	195.88	0.00	4'000.00	989
No college degree	0.60	1.00	0.49	0.00	1.00	989
Bachelor's or Associate's degree	0.29	0.00	0.45	0.00	1.00	989
Master's or higher degree	0.11	0.00	0.32	0.00	1.00	989
Behavioral control variables						
Financial literacy	1.95	2.00	0.84	0.00	3.00	989
Numeracy	2.43	3.00	0.81	0.00	3.00	989
Trust	1.66	2.00	1.26	0.00	5.00	989
Optimism	-2.14	-3.04	8.82	-47.19	25.09	800
Overconfidence	0.39	0.00	0.49	0.00	1.00	291
Loss aversion	2.50	2.00	1.25	1.00	5.00	368
Ambiguity aversion	-0.08	0.00	0.21	-0.44	0.47	849
Alternative behavioral control variables						
Loss aversion dummy	0.53	1.00	0.50	0.00	1.00	328
Ambiguity aversion dummy	0.72	1.00	0.45	0.00	1.00	291

This table reports summary statistics for the variables used in my study of the U.S. sample. All results use post-stratification weights.

Variable	Mean	Median	SD	Min	Max	N
Non-preregistered control variables						
Acquisition and setup	0.60	1.00	0.49	0.00	1.00	989
Convenience	0.48	0.00	0.50	0.00	1.00	989
Cost	0.67	1.00	0.47	0.00	1.00	989
Payment records	0.11	0.00	0.31	0.00	1.00	989
Security	0.26	0.00	0.44	0.00	1.00	989
Card stolen/lost	0.06	0.00	0.23	0.00	1.00	989
Cash stolen/lost	0.09	0.00	0.28	0.00	1.00	989

This table reports summary statistics for the variables used in my study of the U.S. sample. All results use post-stratification weights.

Table A3: Risk attitudes in the U.S. population

A. Bivariate correlations of explanatory variables

	Risk Aversion	**Probability Weighting**	**Card Acceptance**
Risk Aversion	1.00		
Probability Weighting	0.07**	1.00	
Card Acceptance	-0.02	-0.05	1.00

B. Bivariate correlations of behavioral control variables

	Risk Aversion	**Probability Weighting**	**Card Acceptance**
Education	-0.01	0.07**	-0.03
Financial literacy	0.06*	0.11**	0.01
Numeracy	0.08***	0.11**	-0.02
Trust	-0.00	-0.01	-0.00
Optimism	-0.16***	-0.07**	-0.03
Overconfidence	0.02	-0.05	0.02
Loss aversion	0.07	-0.03	-0.01
Ambiguity aversion	0.17***	0.04	-0.12

C. Summary statistics consistency checks for Risk Aversion and Probability Weighting

	Risk Aversion		**Probability Weighting**	
	Consistent	Inconsistent	Consistent	Inconsistent
\$12 question	81%	19%	5% question	68% / 32%
\$18 question	82%	18%	12% question	72% / 28%
\$24 question	84%	16%	25% question	75% / 25%
\$30 question	85%	15%	50% question	74% / 26%
			75% question	77% / 23%
			88% question	76% / 24%

This table shows correlations for the explanatory variables in the U.S. population. Panel A reports pairwise correlations among the explanatory variables, and Panel B shows correlations between the explanatory variables and the set ofbehavioral control variables (*Education*, *Financial literacy*, *Numeracy*, *Trust*, *Optimism*, *Overconfidence*, *Loss aversion*, and *Ambiguity aversion*) . Pearson correlations are used for continuous variables and Spearman correlations otherwise. Panel C reports the share of respondents who passed the internal consistency checks for each of the four risk aversion questions and the six probability weighting questions. The sample size is $N = 989$. All results use post-stratification weights.

$^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

A.2 The elicitation procedure for *Risk Aversion*

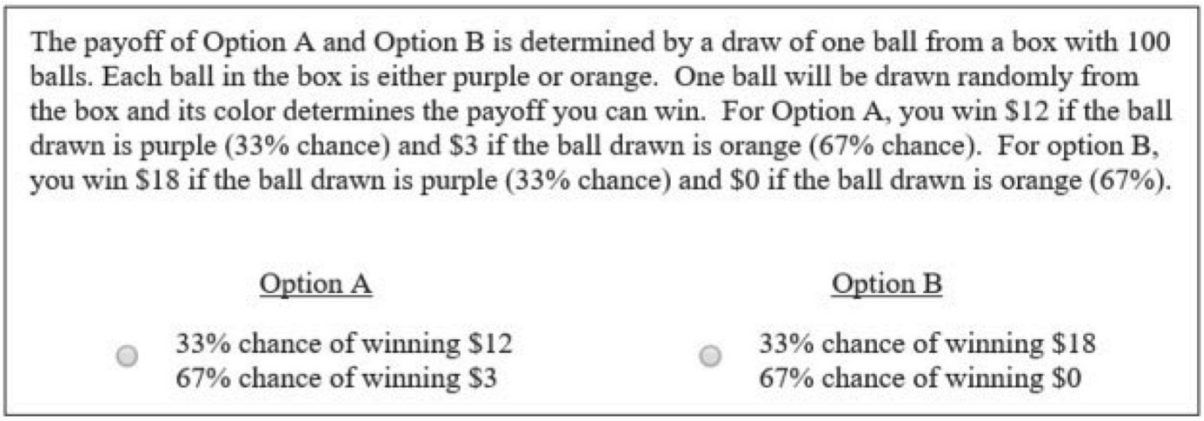
To elicit *Risk Aversion* (utility curvature), Dimmock et al. (2021) present respondents with four questions, each consisting of three rounds. Each round begins with the answer of a risk-neutral expected utility maximizer. The choice offered in the subsequent round depends on the respondent's choice. Figure A1 shows an example of the first round of the first question.

Dimmock et al. (2021, p. 4533) provide the following illustration:

> "Option A offers a 33% chance of winning \$12 and a 67% chance of winning \$3, while option B initially offers a 33% chance of winning \$18 and a 67% chance of winning \$0. Both options have an expected value of \$6 and offer the same chance of winning the larger payoff (33%), but option B is riskier (option B is a mean-preserving spread of option A). If the subject selects the safer option A, then in the next round option B is made more attractive by increasing the winning amount to \$21. If, instead, the subject chooses option B, then in the next round option B is made less attractive by decreasing the winning amount to \$16. This process continues for three rounds until the subject's indifference point is approximated. For each question, the subject is then presented with a fourth choice used only to evaluate consistency with prior choices."

In the four questions, the authors hold the probability of winning the large prize fixed at 33% to cancel out the effects of probability weighting between both options. They chose a probability of 33% because it is usually in the range in which a subject neither under- nor overweights probabilities (Tversky and Fox, 1995). The structure and estimates of the four sets of utility curvature prospects are illustrated in Table A4.

Figure A1: Example of a question to elicit *Risk Aversion*



Source: Figure 4 in Dimmock et al. (2021).

Table A4: Structure and estimates of the four utility curvature prospects

A. Utility curvature questions

	Option A		Option B		Estimates of $X in the data	
	Probability	Amount	Probability	Amount	Mean	Risk premium %
Questions $RA_{\$12}$	33% 67%	$12 $3	33% 67%	$X $0	21.4	18.5
Questions $RA_{\$18}$	33% 67%	$18 $3	33% 67%	$X $0	27.5	14.3
Questions $RA_{\$24}$	33% 67%	$24 $3	33% 67%	$X $0	34.8	15.6
Questions $RA_{\$30}$	33% 67%	$30 $3	33% 67%	$X $0	42.1	16.6

This table shows the four questions used to elicit *Risk Aversion*. All results use ALP survey weights. Source: Table 1, Panel A in Dimmock et al. (2021).

A.3 The elicitation procedure for *Probability Weighting*

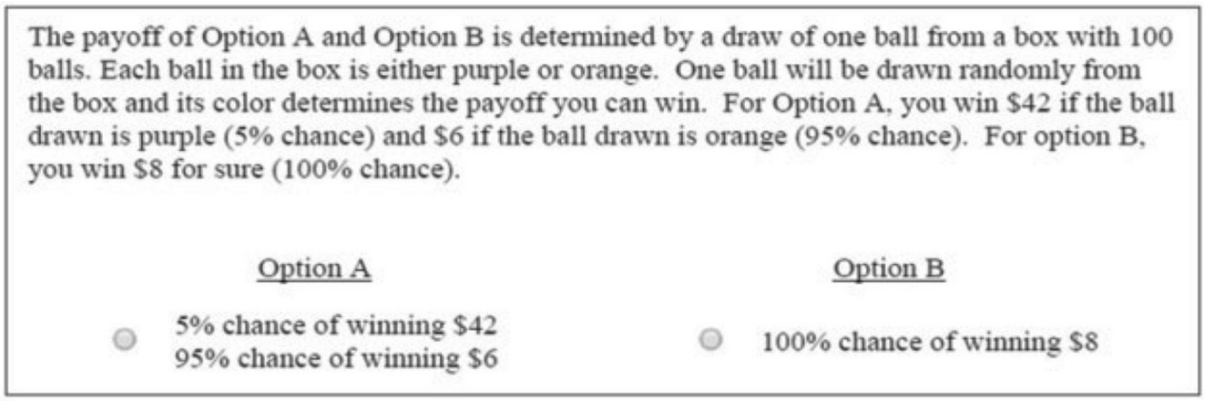
To elicit the probability weighting measure (*Inverse-S*), Dimmock et al. (2021) present the subject with six questions, each having three rounds, presenting a choice between a high-probability payout for small sums of money and a low-probability payout for larger sums. The goal is to elicit the certainty equivalent of the risky prospect. For the questions with small probabilities for the large prize (Questions $PW_{5\%}$ and Questions $PW_{12\%}$), the risk premiums are negative, indicating that the subject overweighs the probability of winning the large sum and thus requires a certainty equivalent greater than the expected value of the risky prospect (see Table A5). For the questions with high-probability payouts for large sums, the risk premiums are positive and increasing, which is consistent with underweighting of large probabilities. Inverse-S is then defined as the risk premiums of the probability underweighting range (large probability questions) minus the risk premiums of the overweighting range (small probability questions):

$$ProbabilityWeighting = (PW_{88\%} + PW_{75\%} + PW_{50\%}) - (PW_{25\%} + PW_{12\%} + PW_{5\%}) \quad (3)$$

Figure A2 presents an example of a first round of one of the six questions. Dimmock et al. (2021, p. 4534) provide the following illustration:

> "[...] option A offers a fixed large payoff of \$42 with probability $p = 5\%$ and a small payoff of \$6 with probability 95%, whereas option B offers a sure amount of \$8. If the subject chooses risky option A, then in the second round the sure amount for option B is increased to \$9. If the subject instead chooses option B, then in the second round the sure amount is reduced to \$7. This process is repeated for three rounds until the certainty equivalent for option A is closely approximated [...]."

Figure A2: Example of a question to elicit *Probability Weighting*



Source: Figure 5 in Dimmock et al. (2021).

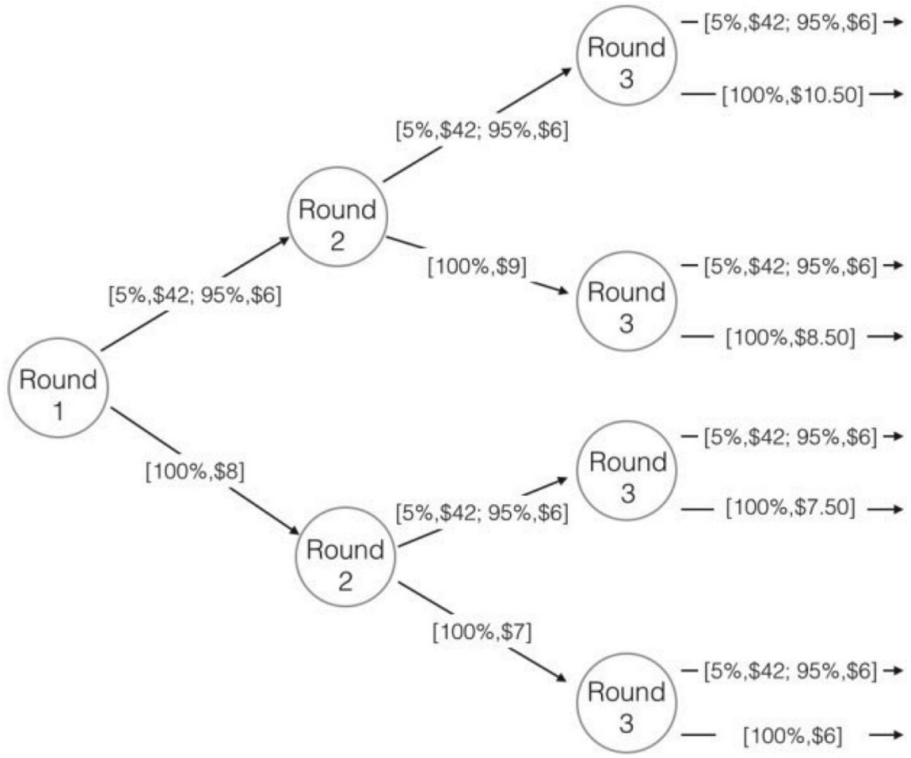
Figure A3 shows an example of this iterative process to elicit the certainty equivalent. The probabilities of winning the large prize (USD 42) in option A are subsequently increased to 12%, 25%, 50%, 75%, and 88%. The authors then calculate the risk premium for each of the six questions (the last column in Table A5). For example, for Question $PW_{5\%}$ the expected value of option A is USD 7.80 ($0.05 \times 42 + 0.95 \times 6 = 7.80$), and the elicited sure amount a subject requires on average to forgo the gamble is USD 8.40. Therefore, the risk premium is

$$\frac{7.80 - 8.40}{7.80} = -7.1\%.$$

The negative risk premium indicates that the subject demands a greater certainty equivalent than the expected value of option A, which shows overweighting of the low probability of winning the large prize.

Further, the authors present the subjects with an additional choice after the three rounds of each question to check whether the responses are consistent. This helps avoid measurement error, which is common in procedures of preference elicitation (Harless and Camerer, 1994, Hey and Orme, 1994). For the six probability weighting questions, between 71% and 78% of respondents provided consistent answers (see Table 3, Panel C in Dimmock et al. (2021)).

Figure A3: Example of question rounds for a probability weighting question



The figure shows an example of the three rounds of the iterative process to elicit the certainty equivalent necessary to construct the probability weighting measure. Source: Figure 6 in Dimmock et al. (2021).

Table A5: Structure and estimates of the six probability weighting prospects

B. Probability weighting questions

	Option A		Option B		Estimates of $X in the data	
	Probability	Amount	Probability	Amount	Mean	Risk premium %
Questions $PW_{5\%}$	5% 95%	$42 $6	100%	$X	8.4	–7.1
Questions $PW_{12\%}$	12% 88%	$42 $6	100%	$X	10.6	–2.3
Questions $PW_{25\%}$	25% 75%	$42 $6	100%	$X	14.3	4.6
Questions $PW_{50\%}$	50% 50%	$42 $6	100%	$X	20.4	15.0
Questions $PW_{75\%}$	75% 25%	$42 $6	100%	$X	25.5	22.8
Questions $PW_{88\%}$	88% 12%	$42 $6	100%	$X	27.0	28.2

This table shows the four questions used to elicit probability weighting. All results use ALP survey weights. Source: Table 1, panel B in Dimmock et al. (2021).

A.4 Survey questions of alternative explanatory variables and behavioral control variables

These are the survey questions for the alternative explanatory variables on risk attitudes *Risk attitude – general* and *Risk attitude – financial* (Stango et al., 2017):[43]

Risk attitude – general

"How do you see yourself: Are you a person who is fully prepared to take risks or do you try to avoid taking risks? Please indicate your answer on a scale from 0–100, where the value 0 means: 'unwilling to take risks' and the value 100 means: 'fully prepared to take risks.' Higher numbers indicate more willingness to take risks. Click on the point on the scale below that best represents your answer."

Risk attitude – financial

"How do you see yourself: Are you generally a person who is fully prepared to take financial risks or do you try to avoid taking financial risks? Please indicate your answer on a scale from 0–100, where the value 0 means: 'unwilling to take financial risks' and the value 100 means: 'fully prepared to take financial risks.' Higher numbers indicate more willingness to take financial risks. Click on the point on the scale below that best represents your answer."

As Dimmock et al. (2021), I also use a risk aversion measure based on choices between a sure lifetime income and a risky lifetime income *Barsky et al. utility curvature* (Barsky et al., 1997)[44]. The questions are an adaptive lifetime income gamble task adopted by the Health and Retirement Study and other surveys (Stango et al., 2017). This allows constructing a proxy for risk attitudes ranging from 1 (most risk tolerant) to 6 (most risk averse) based on the threshold value at which the respondent is willing to switch from the safe to the risky option.

This task starts with:

> "Suppose that you are the only income earner in the family. Your doctor recommends that you move because of allergies, and you have to choose between two possible jobs. The first would guarantee your current total family income for life. The second is possibly better paying, but the income is also less certain. There is a

[43] Well Being 472 – Copy of ms352 – Decision Quality [Composite 2], 16.10.2017 – 05.11.2017, available here.

[44] Well Being 474 – Copy of ms315 – Decision Quality [Composite 1], 02.10.2017 – 27.10.2017, available here.

50% chance the second job would double your current total family income for life and a 50% chance that it would cut it by a third. Which job would you take—the first job or the second job?"

Those taking the risky job are then asked to choose between a 50% probability that it cuts earnings by 50% (and, if they still choose the risky job, by 75%). Those taking the safe job are then confronted with a 50/50 gamble of a 20% decrease, and then, if they still choose the safe job, a 50/50 gamble of a 10% decrease.

These are the survey questions by Dimmock et al. (2021) for the behavioral control variables *Optimism*, *Overconfidence*[45] , *Financial literacy*, *Numeracy*, and *Trust*[46]:

Optimism

Dimmock et al. (2021) measure optimism similarly to Puri and Robinson (2007) comparing self-reported life expectancy to that implied by statistical tables. The question they use is "About how long do you think you will live?" The optimism measure equals the self-reported years minus the expected years according to mortality tables (using separate tables for men and women).

Overconfidence

Stango et al. (2017) measure overconfidence in performance (Moore and Healy, 2008) based on three numeric questions. Afterward, the respondent is asked, "How many of the last 3 questions (the ones on the disease, the lottery, and the savings account) do you think you got correct?". A person is then classified as overconfident if his own assessment is above his actual performance.

Financial Literacy

The financial literacy questions Dimmock et al. (2021) posed in the ALP module have been used in two dozen countries and comparable results obtained (Lusardi and Mitchell, 2011) :

"Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?"

1) More than $102

2) Exactly $102

3) Less than $102

[45] Well Being 472 – Copy of ms352 – Decision Quality [Composite 2], 2017-10-16 until 2017-11-05, available here.

[46] Well Being 481 – Retirement Saving and Probability Weighting, 2017-06-20 until 2017-07-20, available here.

4) Don't know

5) Refuse

"Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, would you be able to buy more than, exactly the same as, or less than today with the money in this account?"

1) More than today

2) Exactly the same as today

3) Less than today

4) Don't know

5) Refuse

"Please tell us whether this statement is true or false. Buying a single company stock usually provides a safer return than a stock or mutual fund."

1) True

2) False

3) Don't know

4) Refuse

Numeracy

Dimmock et al. (2021) assess numeracy using three questions based on those in the HRS and the English Longitudinal Study of Ageing:

"If the chance of getting a disease is 10 percent, how many people out of 1,000 would be expected to get the disease?"

1) About 1 person

2) About 10 people

3) About 100 people

4) About 1000 people

5) Don't know

6) Refuse

"If 5 people all have the winning numbers in the lottery and the prize is two million dollars, how much will each of them get?"

1) $200,000

2) $400,000

3) $1,000,000

4) $2,000,000

5) Don't know

6) Refuse

"A secondhand car dealer is selling a car for $6,000. This is two-thirds of what it costs new. How much did the car cost new?"

1) $7,000

2) $9,000

3) $12,000

4) $18,000

5) Don't know

6) Refuse

Trust

The trust question Dimmock et al. (2021) use was:

"Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people? Please indicate on a score of 0 to 5."

For the results reported in the main paper, the authors reverse the scale of the trust variable so that higher values indicate stronger trust in others (with 0 indicating "You can't be too careful", and with 5 indicating "Most people can be trusted").

Loss aversion

This is the survey question by Choi and Robertson (2020) for the variable *Loss aversion*[47]:

"The possibility of even small losses on my stock investments makes me worry."

1) Not important at all

2) A little important

3) Moderately important

4) Very important

5) Extremely important

For the variable *Loss aversion dummy*, Stango et al. (2017) use the elicitation procedure

[47] Well Being 465 – Financial Decisions, 2016-12-14 until 2016-12-27, available here.

developed by Fehr and Goette (2007)[48]. Respondents can choose between these two lotteries:

Lottery A: A lottery with a 50% chance of winning $80 and a 50% chance of losing $50. Option B: Zero dollars. Which option would you choose?

Lottery B: Play the lottery from the previous question (50% chance of winning $80, 50% chance of losing $50) six times. Option B: Zero dollars. Which option would you choose?

Fehr and Goette (2007) show that, if subjects have reference-dependent preferences, then respondents who reject Lottery A have a higher level of loss aversion than those who accept Lottery A, and respondents who reject both lotteries have a higher level of loss aversion than those who reject only Lottery A. I classify as loss averse respondents that reject one or both lotteries.

Ambiguity aversion

Dimmock et al. (2016) elicit ambiguity aversion through repeated choices between two options: one risky and the other ambiguous, i.e., the probability distribution is unknown[49] The goal of the staircase method is to elicit the indifference point for the ambiguous option (i.e., the share of purple balls that is required in the risky option so that a subject is indifferent between the risky and the ambiguous option). The ambiguity aversion measure is then calculated as $0.5-q$, where q refers to the share of purple balls in the risky option that implies indifference (Figure A4).

Ambiguity aversion dummy

This is the survey question by Stango et al. (2017) for the variable *Ambiguity aversion dummy*[50] Respondents that choose the urn with known distribution of balls are deemed ambiguity averse:

"Imagine you are going to play a game where you draw one ball out of a bag without looking. If the ball you choose is GREEN, then you win $500. There are two bags, and you get to pick one bag to choose the one ball from."

Bag One: 100 balls, 45 GREEN balls and 55 YELLOW balls.

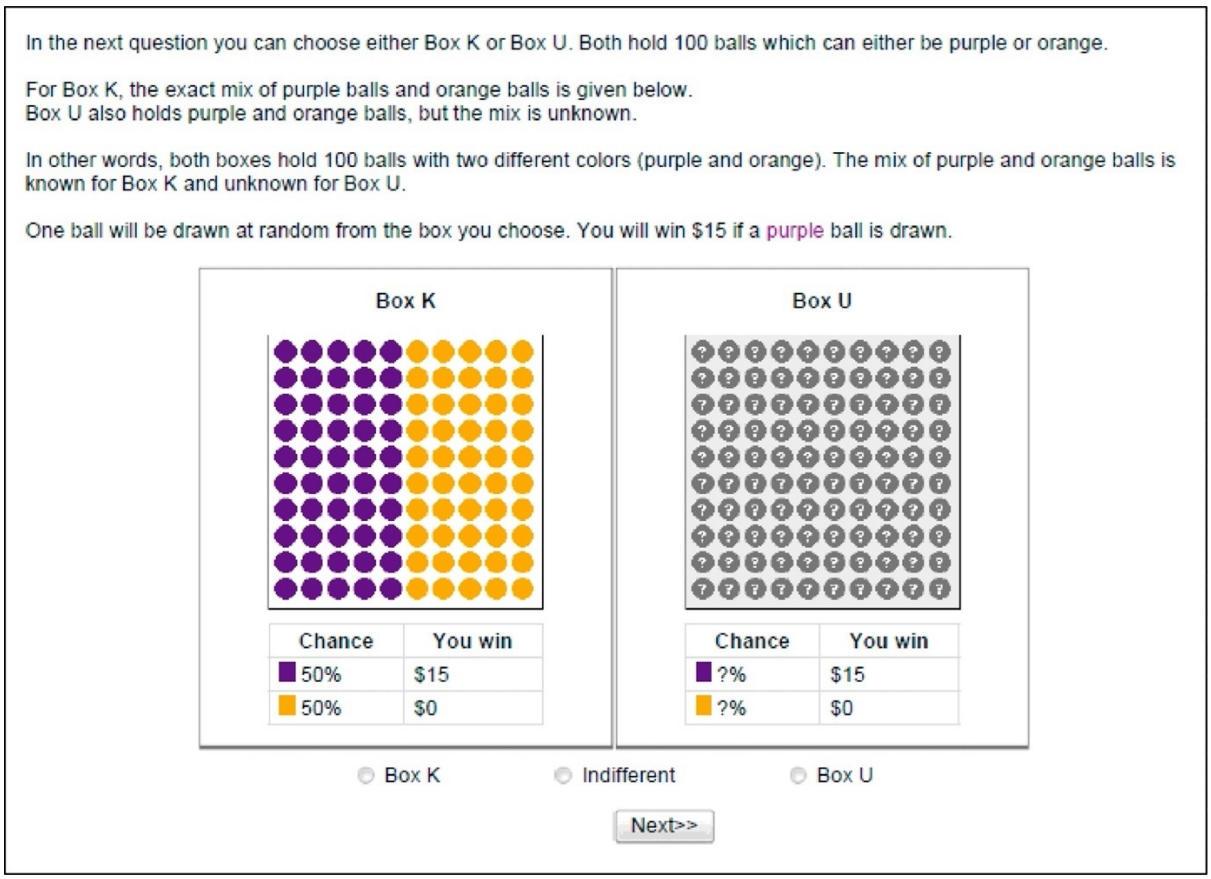
Bag Two: 100 balls, some GREEN and some YELLOW, you don't know how many there are of each.

[48] Well Being 474 – Copy of ms315 – Decision Quality [Composite 1], 2017-10-02 until 2017-10-27, available here.

[49] Well Being 243 – Netspar uncertainty, 2012-03-20 until 2012-04-16, available here.

[50] Well Being 472 – Copy of ms352 – Decision Quality [Composite 2], 2017-10-16 until 2017-11-05, available here.

Figure A4: Decision task to elicit *Ambiguity aversion*



Choosing between two boxes with purple and orange balls, one having a known (50%) chance of winning and the other ambiguous. This figure shows a screenshot from the American Life Panel module representing the first question in the ambiguity elicitation sequence. Box K has a 50% initial known probability of winning; Box U has an unknown mix of purple and orange balls. If the respondent selects "Box K," they are taken to a new question with a lower probability of winning in Box K (fewer purple balls). If they select "Box U," the next question has a higher probability of winning in Box K (more purple balls). If the respondent selects "Indifferent," or after four rounds, the question sequence is complete. Source: Figure 1 in Dimmock et al. (2016), p. 562.

A.5 Post-stratification weights

After combining both surveys, Well Being 401 and Well Being 481, the respective survey weights are no longer correct due to attrition from the 2014 to the 2017 survey. To make the RAND ALP sample again representative of the U.S. population I calculate post-stratification weights using the 2017 one-year Census Bureau's American Community Survey (ACS) Public Use Microdata Sample (PUMS). Following the RAND ALP methodology, the weights match on four bivariate discrete distributions: gender by age, gender by race, gender by education, and family income by adult household size (Table A6). I adopted a raking algorithm to calculate these weights.

Table A6: Set of weighting variables

Gender × Age				
M, $18-32$	M, $33-43$	M, $44-54$	M, $55-64$	M, $65+$
F, $18-32$	F, $33-43$	F, $44-54$	F, $55-64$	F, $65+$

Gender × Ethnicity	
M, White	M, Other
F, White	F, Other

Gender × Education		
M, High School or Less	M, Some College	M, Bachelor's Degree or More
F, High School or Less	F, Some College	F, Bachelor's Degree or More

Household Size × Household Income			
Single, $< \$30K$	Single, $\$30K - \$59K$	Single, $\geq 60K$	
Couple, $< \$30K$	Couple, $\$30K - \$59K$	Couple,$\$60K - \$99K$	Couple, $\geq \$100K$
≥ 3 , $< \$30K$	≥ 3 , $\$30K - \$59K$	≥ 3 ,$\$60K - \$99K$	≥ 3 , $\geq \$100K$

The set of weighting variables. "M" stands for male, and "F" stands for female. The highest income brackets for single households were combined to avoid small cell sizes. Source: Table 7 in Angrisani et al. (2017).

Table A7 shows the extent to which the post-stratification weights correct for misalignment between sample and population distributions of key socio-economic variables, as well as when using the weights of Well Being 481.

Table A7: Post-stratification weights

	Population Census ACS 2017	Unweighted sample	Weighted sample post-stratification weights	Weighted sample Well Being 481 weights
Gender				
Male	49%	45%	47%	48%
Female	51%	55%	53%	52%
Race				
White	64%	82%	64%	80%
Non-white	36%	18%	36%	20%
Age				
18–32	27%	6%	23%	20%
33–43	18%	17%	19%	22%
44–54	18%	18%	20%	21%
55–64	17%	31%	18%	18%
65+	20%	28%	20%	19%
Education				
High School or less	36%	13%	34%	37%
Some College	26%	24%	27%	20%
College or more	38%	63%	39%	43%
Household Income				
$ <30k	19%	18%	19%	19%
$30k–59,999	23%	25%	23%	22%
$60k–99,999	24%	27%	24%	28%
$100k+	34%	30%	34%	30%
Household Composition				
Single	15%	57%	15%	39%
Couple	35%	18%	34%	21%
3 or more members	51%	25%	51%	40%

This table illustrates how sample weights correct for misalignment between sample and U.S. population distributions of key socio-economic variables. Population data are taken from the 2017 Census Bureau's American Community Survey (ACS) Public Use Microdata Sample (PUMS). The number of consumers in the sample is 1,021.

A.6 Risk attitudes and cash holdings – full results

Table A8: Risk attitudes and cash holdings – full results

	Cash Holdings				ln(***Cash Holdings Amount***)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Risk Aversion								
Quartile 2	−0.029	0.026	−0.425**	−0.012	−0.359	0.132	−1.943**	0.453
	(0.053)	(0.108)	(0.189)	(0.302)	(0.267)	(0.505)	(0.872)	(1.536)
Quartile 3	−0.063	0.045	−0.420*	−1.391***	−0.397	0.348	−3.603***	−7.106***
	(0.058)	(0.120)	(0.216)	(0.398)	(0.287)	(0.597)	(1.034)	(2.057)
Quartile 4	−0.123*	−0.080	−0.607***	−1.087**	−0.165	0.376	−5.263***	−5.477**
	(0.064)	(0.140)	(0.222)	(0.476)	(0.310)	(0.599)	(1.064)	(2.411)
Probability weighting	0.002	0.054	−0.228**	0.005	−0.134	0.172	−2.302***	0.849**
	(0.021)	(0.045)	(0.088)	(0.080)	(0.096)	(0.207)	(0.432)	(0.397)
High Card Acceptance	0.048	0.126	0.671***	−0.097	0.221	0.854**	0.653	−1.308
	(0.048)	(0.087)	(0.127)	(0.526)	(0.228)	(0.373)	(0.572)	(2.670)
*Risk Aversion * High Card Acceptance*								
Quartile 2		−0.069		−0.170		−0.618		−2.319
		(0.124)		(0.498)		(0.551)		(2.563)
Quartile 3		−0.150		1.817***		−1.022		9.582***
		(0.139)		(0.528)		(0.665)		(2.767)
Quartile 4		−0.057		0.430		−0.730		2.945
		(0.152)		(0.651)		(0.669)		(3.321)
Probability Weighting * High card acceptance		−0.065		0.032		−0.385		−1.651***
		(0.053)		(0.103)		(0.237)		(0.514)
Education	0.001	−0.004	0.359***	0.077	0.043	0.007	0.262	0.286
	(0.028)	(0.028)	(0.075)	(0.110)	(0.143)	(0.142)	(0.330)	(0.552)
Financial literacy	0.010	0.011	−0.386***	−0.103	−0.008	0.001	−0.275	0.013
	(0.027)	(0.026)	(0.092)	(0.129)	(0.129)	(0.121)	(0.430)	(0.648)
Numeracy	0.038	0.035	−0.092	−0.001	0.350***	0.335***	−0.291	0.691**
	(0.028)	(0.028)	(0.111)	(0.062)	(0.121)	(0.119)	(0.506)	(0.313)
Trust	−0.053**	−0.050**	0.135	0.113	−0.175	−0.157	1.450***	0.058
	(0.024)	(0.024)	(0.087)	(0.074)	(0.114)	(0.114)	(0.420)	(0.370)
Optimism			0.079	0.105***			1.351***	0.620***
			(0.053)	(0.028)			(0.244)	(0.129)
Overconfidence			0.173***	0.046			0.474**	0.264
			(0.040)	(0.087)			(0.185)	(0.439)
Loss aversion			0.426***	0.255***			−0.033	0.300
			(0.099)	(0.094)			(0.449)	(0.456)
Ambiguity aversion			0.231	0.315*			3.348***	1.668*
			(0.158)	(0.187)			(0.761)	(0.968)

	Cash Holdings				ln(*Cash Holdings Amount)*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female	−0.030	−0.032	−0.510**	−0.197	−0.501**	−0.526**	1.999**	−0.520
	(0.045)	(0.045)	(0.212)	(0.295)	(0.226)	(0.226)	(0.972)	(1.454)
Married	0.103*	0.099*	0.278	−0.173	0.322	0.299	−1.626	0.239
	(0.058)	(0.057)	(0.217)	(0.125)	(0.261)	(0.255)	(1.029)	(0.564)
White	0.112**	0.104*	0.270*	−0.459***	0.285	0.235	1.734**	−3.051***
	(0.057)	(0.056)	(0.147)	(0.064)	(0.253)	(0.250)	(0.674)	(0.314)
Hispanic	0.123*	0.123*	−0.221	−0.214**	0.301	0.313	−1.416**	−1.228***
	(0.069)	(0.069)	(0.147)	(0.081)	(0.317)	(0.311)	(0.661)	(0.435)
(ln) Number of household members	−0.066**	−0.066**	0.176	−0.162	−0.208	−0.206	−1.874**	−0.927
	(0.030)	(0.030)	(0.176)	(0.138)	(0.150)	(0.150)	(0.790)	(0.662)
Employed	−0.062	−0.062	−0.095	−0.039	0.019	0.004	−3.775***	0.748
	(0.054)	(0.055)	(0.262)	(0.207)	(0.247)	(0.249)	(1.205)	(1.036)
(ln) Family income	0.003	0.003	−0.465***	−0.210	−0.037	−0.033	0.412	−1.411**
	(0.032)	(0.032)	(0.156)	(0.140)	(0.143)	(0.143)	(0.705)	(0.698)
(ln) Financial wealth	−0.001	0.001	−0.442***	−0.462**	0.202	0.206	−2.951***	−2.940**
	(0.030)	(0.031)	(0.128)	(0.221)	(0.147)	(0.149)	(0.606)	(1.124)
(ln) Housing wealth	0.031	0.031	0.720***	0.753***	0.041	0.046	2.234***	3.974***
	(0.028)	(0.028)	(0.085)	(0.198)	(0.141)	(0.137)	(0.382)	(0.992)
Age 20–25	0.286*	0.378**			1.954***	2.615***		
	(0.162)	(0.172)			(0.716)	(0.746)		
Age 31–35	0.155	0.147	−0.629*	0.348**	0.197	0.157	−5.378***	0.383
	(0.101)	(0.101)	(0.325)	(0.167)	(0.441)	(0.428)	(1.518)	(0.854)
Age 36–40	0.108	0.078	−0.139	1.177***	0.819	0.637	2.734**	6.053***
	(0.119)	(0.122)	(0.281)	(0.279)	(0.539)	(0.545)	(1.241)	(1.478)
Age 41–45	0.233**	0.218**	0.411	0.657	1.011**	0.929*	3.564***	1.789
	(0.102)	(0.106)	(0.275)	(0.486)	(0.499)	(0.497)	(1.258)	(2.575)
Age 46–50	0.137	0.121	−0.227	0.132	0.912	0.838	−0.703	−0.996
	(0.118)	(0.119)	(0.234)	(0.300)	(0.583)	(0.573)	(1.054)	(1.576)
Age 51–55	0.160	0.134	−0.347	0.100	0.615	0.460	−4.379**	0.079
	(0.114)	(0.119)	(0.419)	(0.244)	(0.515)	(0.528)	(2.010)	(1.169)
Age 56–60	0.170	0.156	−1.365**	−0.758*	0.972*	0.902*	−7.324***	−3.971*
	(0.108)	(0.110)	(0.582)	(0.444)	(0.503)	(0.498)	(2.709)	(2.206)
Age 61–65	0.221**	0.194*	−1.070*	−0.815***	1.685***	1.520***	−4.738*	−4.623***
	(0.109)	(0.113)	(0.603)	(0.135)	(0.521)	(0.533)	(2.761)	(0.696)

	Cash Holdings				ln(*Cash Holdings Amount*)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Age 66–70	0.023	0.004			0.516	0.394		
	(0.122)	(0.126)			(0.548)	(0.567)		
Age 71–75	0.057	0.030			0.615	0.439		
	(0.153)	(0.153)			(0.651)	(0.629)		
Age 76–80	0.144	0.157			1.181*	1.299*		
	(0.125)	(0.133)			(0.668)	(0.719)		
Age 81–85	0.214**	0.171			2.352***	2.090**		
	(0.103)	(0.124)			(0.810)	(0.840)		
Age 86–90	0.482***	0.448***			2.071***	1.933***		
	(0.143)	(0.148)			(0.597)	(0.621)		
Age 91–95	0.035	−0.049			1.869***	1.403*		
	(0.132)	(0.144)			(0.662)	(0.723)		
Constant	0.703***	0.668***	−1.810**	1.224	2.631***	2.297***	7.317*	5.777
	(0.126)	(0.137)	(0.866)	(1.290)	(0.531)	(0.543)	(3.951)	(6.461)
Observations	989	989	89	89	989	989	89	89
Mean of dependent variable	0.924	0.924	0.924	0.924	3.371	3.371	3.371	3.371
Adjusted R^2	0.188	0.196	0.972	0.998	0.214	0.230	0.975	0.998

This table reports OLS regression results for the full U.S. sample. The dependent variable is either *Cash Holdings* (columns 1–4) or ln(*Cash Holdings Amount*) (columns 5–8). Robust standard errors are reported in parentheses. All nonbinary independent variables are standardized. All results use post-stratification weights. Data source: RAND American Life Panel.

$^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

Table A9: Risk attitudes and cash holdings – full results card payers

	Cash share < 50%				***No cash transactions***			
	Cash Holdings		ln*(Cash Holdings Amount)*		*Cash Holdings*		ln*(Cash Holdings Amount)*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Risk Aversion								
Quartile 2	−0.047	−0.025	−0.455	−0.207	−0.273	−1.324***	−0.561	−4.807***
	(0.057)	(0.115)	(0.284)	(0.542)	(0.260)	(0.192)	(0.903)	(0.218)
Quartile 3	−0.111*	−0.034	−0.536*	−0.225	−1.014***	−1.010*	−3.782***	−11.465***
	(0.061)	(0.128)	(0.297)	(0.578)	(0.321)	(0.568)	(0.947)	(0.520)
Quartile 4	−0.146**	−0.139	−0.168	0.084	−0.999	−0.670	−3.602	−3.664***
	(0.069)	(0.161)	(0.330)	(0.675)	(0.681)	(0.522)	(2.542)	(0.589)
Probability weighting	−0.007	0.044	−0.143	0.165	−0.132	−1.186***	−0.158	−2.772***
	(0.022)	(0.045)	(0.097)	(0.203)	(0.107)	(0.271)	(0.304)	(0.196)
High Card Acceptance	0.052	0.097	0.208	0.514	−0.303*	−0.917***	−0.205	−3.442***
	(0.050)	(0.100)	(0.235)	(0.417)	(0.168)	(0.197)	(0.624)	(0.225)
*Risk Aversion * High Card Acceptance*								
Quartile 2		−0.023		−0.279		2.890***		8.223***
		(0.133)		(0.578)		(0.494)		(0.407)
Quartile 3		−0.110		−0.440		0.640*		8.506***
		(0.149)		(0.652)		(0.374)		(0.403)
Quartile 4		−0.008		−0.328		−0.486		−1.465***
		(0.176)		(0.756)		(0.409)		(0.415)
Probability Weighting * High card acceptance		−0.066		−0.388*		0.292**		0.168
		(0.053)		(0.233)		(0.134)		(0.131)
Education	0.009	0.005	0.169	0.144	−0.053	−0.101**	−0.334	−0.534***
	(0.030)	(0.031)	(0.145)	(0.149)	(0.109)	(0.040)	(0.379)	(0.058)
Financial literacy	0.002	0.003	−0.082	−0.070	−0.058	−0.396***	0.299	−0.551***
	(0.028)	(0.027)	(0.127)	(0.124)	(0.090)	(0.071)	(0.337)	(0.088)
Numeracy	0.039	0.037	0.312**	0.295**	−0.128***	−0.242***	−0.189	−0.572***
	(0.030)	(0.030)	(0.127)	(0.128)	(0.036)	(0.031)	(0.216)	(0.040)
Trust	−0.055**	−0.052**	−0.221*	−0.208*	0.075	0.064	0.482	1.050***
	(0.025)	(0.026)	(0.115)	(0.118)	(0.169)	(0.061)	(0.508)	(0.129)
Female	−0.043	−0.043	−0.528**	−0.536**	0.643***	−0.032	2.912***	2.276***
	(0.046)	(0.046)	(0.229)	(0.232)	(0.223)	(0.218)	(0.582)	(0.173)
Married	0.124**	0.124**	0.417	0.419	−0.954***	−1.597***	−2.033**	−5.754***
	(0.062)	(0.061)	(0.263)	(0.260)	(0.249)	(0.145)	(0.868)	(0.237)
White	0.106*	0.096	0.327	0.284	−0.232	0.486***	−0.745*	0.430***
	(0.058)	(0.059)	(0.249)	(0.254)	(0.169)	(0.155)	(0.446)	(0.119)
Hispanic	0.096	0.090	0.430	0.405	−1.455**	−2.503***	−5.433**	−7.761***
	(0.073)	(0.073)	(0.338)	(0.337)	(0.638)	(0.200)	(2.265)	(0.299)
(ln) Number of household members	−0.067*	−0.068*	−0.150	−0.160	0.016	0.445***	−0.121	1.295***
	(0.035)	(0.036)	(0.168)	(0.170)	(0.054)	(0.101)	(0.220)	(0.105)
Employed	−0.023	−0.018	0.076	0.065	0.470	0.754***	2.816	3.744***
	(0.055)	(0.057)	(0.243)	(0.246)	(0.533)	(0.110)	(1.778)	(0.262)

	Cash share < 50%				***No cash transactions***			
	Cash Holdings		ln(*Cash Holdings Amount)*		*Cash Holdings*		ln(*Cash Holdings Amount)*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(ln) Family income	0.023	0.025	0.045	0.060	0.060	−0.060	−0.555	−0.442***
	(0.037)	(0.036)	(0.156)	(0.152)	(0.159)	(0.064)	(0.421)	(0.113)
(ln) Financial wealth	−0.010	−0.008	0.168	0.163	0.214	0.858***	0.155	1.633***
	(0.031)	(0.031)	(0.144)	(0.145)	(0.190)	(0.170)	(0.473)	(0.217)
(ln) Housing wealth	0.033	0.034	0.054	0.058	0.176*	0.170***	0.138	−0.312***
	(0.029)	(0.029)	(0.148)	(0.147)	(0.096)	(0.060)	(0.231)	(0.048)
Age 20–25	0.405**	0.487**	2.390***	2.899***				
	(0.193)	(0.202)	(0.771)	(0.820)				
Age 31–35	0.152	0.138	0.368	0.307	0.106	−0.411*	−0.323	−0.305
	(0.113)	(0.114)	(0.484)	(0.481)	(0.417)	(0.217)	(1.193)	(0.213)
Age 36–40	0.161	0.128	1.007*	0.846	−1.512***	−1.484***	−3.460***	−3.029***
	(0.127)	(0.133)	(0.540)	(0.559)	(0.461)	(0.147)	(1.000)	(0.326)
Age 41–45	0.269**	0.248**	1.410***	1.285**	0.106	0.189*	0.578	1.075***
	(0.107)	(0.114)	(0.497)	(0.519)	(0.295)	(0.104)	(1.094)	(0.155)
Age 46–50	0.194	0.171	1.224**	1.125*	−0.642	−0.827***	−0.889	−0.409**
	(0.123)	(0.125)	(0.583)	(0.585)	(0.444)	(0.181)	(1.295)	(0.183)
Age 51–55	0.196	0.166	0.923*	0.772	0.928***	1.544***	3.453***	6.765***
	(0.121)	(0.128)	(0.528)	(0.547)	(0.323)	(0.148)	(1.045)	(0.197)
Age 56–60	0.218*	0.201*	1.367***	1.277**	−0.380	−3.103***	3.573*	−2.811***
	(0.112)	(0.115)	(0.492)	(0.500)	(0.718)	(0.707)	(1.935)	(0.650)
Age 61–65	0.259**	0.234*	2.017***	1.859***	0.114	−0.357	4.422***	5.114***
	(0.116)	(0.124)	(0.539)	(0.565)	(0.517)	(0.285)	(1.521)	(0.450)
Age 66–70	0.084	0.064	0.893	0.761				
	(0.126)	(0.132)	(0.558)	(0.582)				
Age 71–75	0.123	0.100	0.956	0.842				
	(0.162)	(0.164)	(0.692)	(0.679)				
Age 76–80	0.246*	0.257*	1.823***	1.871**	0.207	1.062***	2.905***	7.359***
	(0.134)	(0.142)	(0.686)	(0.733)	(0.260)	(0.124)	(0.884)	(0.228)
Age 81–85	0.323***	0.285**	3.078***	2.803***				
	(0.109)	(0.132)	(0.812)	(0.857)				
Age 86–90	0.548***	0.511***	2.257***	2.088***	−0.190	−1.065***	1.938	−1.304***
	(0.157)	(0.161)	(0.635)	(0.664)	(0.686)	(0.347)	(2.457)	(0.445)
Age 91–95	0.128	0.047	2.366***	2.066***				
	(0.132)	(0.142)	(0.657)	(0.719)				
Constant	0.651***	0.641***	2.193***	2.094***	1.871***	2.282***	3.304***	5.978***
	(0.128)	(0.139)	(0.523)	(0.535)	(0.382)	(0.213)	(0.836)	(0.223)
Observations	890	890	890	890	117	117	117	117
Mean of dependent variable	0.925	0.925	3.343	3.343	0.846	0.846	2.768	2.768
Adjusted R^2	0.200	0.206	0.228	0.236	0.816	0.961	0.914	0.994

This table reports OLS regression results for two U.S. subsamples. Columns (1)–(4) restrict the sample to individuals with less than 50% of their transactions made in cash. Columns (5)–(8) restrict the sample to individuals who report no cash transactions. The dependent variable is either *Cash Holdings* (columns 1–2 and 5–6) or ln(*Cash Holdings Amount*) (columns 3–4 and 7–8). Robust standard errors are reported in parentheses. All nonbinary independent variables are standardized. All results use post-stratification weights. Data source: RAND American Life Panel.

$^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

Table A10: Risk attitudes and cash use – full results

	Cash share of all POS transactions (volume)		***Cash share of all in person transactions (value)***	
	(1)	(2)	(3)	(4)
Risk Aversion				
Quartile 2	−0.018	−0.077	−0.042	−0.350***
	(0.025)	(0.050)	(0.082)	(0.121)
Quartile 3	−0.000	−0.004	0.006	−0.175
	(0.031)	(0.058)	(0.078)	(0.110)
Quartile 4	−0.015	−0.070	−0.092	−0.543***
	(0.033)	(0.062)	(0.094)	(0.140)
Probability Weighting	0.000	0.010	−0.028	−0.034
	(0.009)	(0.021)	(0.030)	(0.054)
High Card Acceptance	−0.008	−0.044	0.043	−0.215**
	(0.023)	(0.046)	(0.063)	(0.104)
*Risk Aversion * High Card Acceptance*				
Quartile 2		0.077		0.388**
		(0.057)		(0.154)
Quartile 3		0.000		0.219
		(0.065)		(0.148)
Quartile 4		0.073		0.594***
		(0.076)		(0.175)
Probability Weighting * High Card Acceptance		−0.011		−0.001
		(0.024)		(0.063)
Education	−0.014	−0.013	0.000	0.013
	(0.012)	(0.013)	(0.032)	(0.033)
Financial literacy	−0.000	−0.002	−0.049	−0.062*
	(0.013)	(0.013)	(0.032)	(0.034)
Numeracy	0.024**	0.022**	0.014	0.014
	(0.011)	(0.011)	(0.037)	(0.038)
Trust	−0.009	−0.007	−0.045	−0.036
	(0.011)	(0.011)	(0.031)	(0.031)

	Cash share of all POS transactions (volume)		*Cash share of all in person transactions (value)*	
	(1)	(2)	(3)	(4)
Female	−0.016	−0.016	0.026	0.023
	(0.022)	(0.022)	(0.063)	(0.060)
Married	−0.039	−0.040	−0.071	−0.078
	(0.025)	(0.025)	(0.078)	(0.075)
White	0.037	0.036	0.008	0.018
	(0.025)	(0.025)	(0.062)	(0.062)
Hispanic	−0.003	−0.005	0.036	0.050
	(0.032)	(0.032)	(0.075)	(0.078)
(ln) Number of household members	0.009	0.008	0.042	0.047
	(0.018)	(0.018)	(0.039)	(0.040)
Employed	−0.038	−0.034	−0.093	−0.069
	(0.025)	(0.025)	(0.064)	(0.066)
(ln) Family income	−0.027*	−0.028*	−0.080*	−0.101**
	(0.016)	(0.015)	(0.041)	(0.044)
(ln) Financial wealth	0.017	0.019	0.031	0.062
	(0.013)	(0.013)	(0.041)	(0.042)
(ln) Housing wealth	−0.035***	−0.034***	−0.078**	−0.081**
	(0.012)	(0.012)	(0.039)	(0.035)
Age 31–35	0.026	0.020	−0.064	−0.067
	(0.044)	(0.045)	(0.148)	(0.146)
Age 36–40	0.051	0.043	−0.241*	−0.261*
	(0.043)	(0.043)	(0.145)	(0.150)
Age 41–45	0.008	0.007	−0.131	−0.118
	(0.046)	(0.046)	(0.139)	(0.138)
Age 46–50	0.018	0.009	−0.098	−0.100
	(0.044)	(0.045)	(0.158)	(0.146)
Age 51–55	0.053	0.047	−0.151	−0.151
	(0.044)	(0.045)	(0.142)	(0.142)
Age 56–60	0.095**	0.091**	−0.063	−0.070
	(0.041)	(0.040)	(0.139)	(0.130)
Age 61–65	0.070	0.067	−0.085	−0.046
	(0.070)	(0.071)	(0.153)	(0.148)

	Cash share of all POS transactions (volume)		*Cash share of all in person transactions (value)*	
	(1)	(2)	(3)	(4)
Age 66–70	−0.020	−0.023	−0.374**	−0.360**
	(0.050)	(0.051)	(0.164)	(0.160)
Age 71–75	−0.019	−0.024	−0.356**	−0.286*
	(0.079)	(0.079)	(0.169)	(0.170)
Age 76–80	−0.065	−0.069	−0.138	−0.256
	(0.061)	(0.060)	(0.219)	(0.206)
Age 81–85	0.007	0.017	−0.626***	−0.619***
	(0.065)	(0.070)	(0.173)	(0.174)
Age 86–90	−0.126**	−0.143**	−0.358*	−0.446**
	(0.061)	(0.061)	(0.185)	(0.179)
Age 91–95	0.150**	0.116*		
	(0.062)	(0.068)		
Constant	0.182***	0.217***	0.602***	0.799***
	(0.055)	(0.062)	(0.166)	(0.162)
Observations	962	962	512	512
Mean of dependent variable	0.189	0.189	0.411	0.411
Adjusted R^2	0.164	0.171	0.364	0.413

This table reports OLS regression results for cash use in the U.S. sample. The dependent variable is either *Cash share of all POS transactions (volume)* (columns 1–2) or *Cash share of all in person transactions (value)* (columns 3–4). Robust standard errors are reported in parentheses. All nonbinary independent variables are standardized. All results use post-stratification weights. Data source: RAND American Life Panel.
*$p < .05$; **$p < .01$; ***$p < .001$.

Table A11: Risk attitudes and cash holdings – subgroup regressions

	Low education (1)	**Low numeracy** (2)	**Low financial literacy** (3)	**Low income** (4)	**Seniors 65+** (5)	**High payment rating** (6)	**High convenience rating** (7)
Risk Aversion							
Quartile 2	−0.412	1.326***	3.356**	−0.042	−3.290***	0.138	0.695
	(0.600)	(0.411)	(1.480)	(1.187)	(0.704)	(1.334)	(0.686)
Quartile 3	1.137	3.713***	1.918*	1.449	−2.419**	−10.088***	0.325
	(0.789)	(0.414)	(1.040)	(0.921)	(1.021)	(1.630)	(1.158)
Quartile 4	0.398	7.382***	1.400	2.268**	−5.123***	−0.549	0.885
	(0.706)	(0.497)	(1.008)	(1.104)	(1.555)	(1.345)	(0.616)
Probability Weighting	0.505	−1.035***	−0.081	−0.100	0.632	2.282***	−0.071
	(0.317)	(0.257)	(0.578)	(0.597)	(0.547)	(0.614)	(0.257)
High Card Acceptance	1.690***	3.305***	2.512***	2.378**	−2.458***	0.607	1.391***
	(0.481)	(0.696)	(0.837)	(1.183)	(0.847)	(1.106)	(0.448)
Education	−0.274	0.117	−0.086	−0.525	0.097	−0.291	0.123
	(0.270)	(0.177)	(0.354)	(0.409)	(0.250)	(0.411)	(0.178)
Financial literacy	0.155	−0.258	−0.213	−0.292	−0.142	0.450	0.069
	(0.162)	(0.276)	(0.516)	(0.269)	(0.206)	(0.321)	(0.187)
Numeracy	0.242*	0.037	0.433*	0.556**	0.350	0.230	0.308**
	(0.138)	(0.231)	(0.252)	(0.259)	(0.300)	(0.265)	(0.155)
Trust	−0.110	−0.299	−0.359	0.044	−0.456*	0.053	−0.071
	(0.118)	(0.185)	(0.333)	(0.441)	(0.265)	(0.345)	(0.155)
Interaction terms	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Socioeconomic control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Behavioral control variables	No	No	No	No	No	No	No
Observations	363	94	173	171	270	144	484
Mean of dependent variable	3.221	2.586	2.791	2.969	3.810	3.320	3.415
Adjusted R^2	0.258	0.986	0.424	0.672	0.571	0.607	0.357

This table reports OLS regression results for subgroups of the U.S. sample. The dependent variable is ln(*Cash Holdings Amount*). Explanatory variables include *Risk Aversion*, *Probability Weighting*, and *High Card Acceptance*. All columns include socioeconomic controls for *Female*, 5-year *Age* category dummies, *Married*, *White*, *Hispanic*, ln(*Number of household members*), *Employed*, ln(*Family income*), ln(*Financial wealth*), and ln(*Housing wealth*), as well as behavioral controls for *Education*, *Financial literacy*, *Numeracy*, and *Trust*. All nonbinary independent variables are standardized. All results use post-stratification weights.

*$p < .10$; **$p < .05$; ***$p < .01$.

A.7 Robustness checks for the U.S. sample

Table A12: Overview of robustness checks for the U.S. sample

Dimension	Description and findings
Preregistered	
Sampling criteria	Excluding respondents who performed poorly on the consistency-check questions of the risk-aversion and probability-weighting measures does not change the results.
Outcome variables	Including on-property cash holdings or large-value cash holdings leaves results unchanged.
Estimation methods	Tobit model (for bounded *Cash Holdings Amount*) and logit model (for binary *Cash Holdings*) both confirm main results.
Explanatory variables (risk preferences)	Using self-reported general and financial risk attitudes, or the Barsky et al. (1997) measure, yields similar null results.
Explanatory variables (prepaid cards)	Considering also prepaid cards together with debit and credit cards confirms the main findings.
Explanatory variables (probability weighting)	Using alternative nonparametric probability-weighting measures yields nonsignificant results.
Explanatory variables (probability weighting)	Using parametric measures (Prelec, 1998, Tversky and Kahneman, 1992, Bordalo et al., 2013) instead of the nonparametric measure yields nonsignificant results.
Non-preregistered	
Payment method characteristics	Adding controls for *Acquisition and Setup*, *Convenience*, *Cost*, *Payment records*, and *Security* shows no association with cash holdings.
Spending controls	Expressing cash holdings as a share of total expenditure, or including spending as a regressor, leaves results unchanged.
Safety concerns	Neither cash stolen/lost in the last 12 months nor negative card experiences affect cash holdings.

The table summarizes preregistered and non-preregistered robustness checks for my U.S. sample analysis.

Table A13: Risk attitudes and cash holdings – alternative sampling and outcome variables

	Sample: excl. *Probability Weighting* inattentive	**Sample: excl. *Risk Aversion* inattentive**	**Outcome: *Cash Holdings Amount* – all**	**Outcome: *Cash Holdings Amount* (large-value)**	**Logit model: *Cash Holdings***
	(1)	(2)	(3)	(4)	(5)
Risk Aversion					
Quartile 2	0.392	0.833	0.046	0.130	−0.081
	(0.479)	(0.571)	(0.541)	(0.505)	(0.874)
Quartile 3	0.857	0.670	−0.146	0.345	1.589
	(0.583)	(0.633)	(0.698)	(0.599)	(1.335)
Quartile 4	0.248	0.568	0.738	0.381	−0.693
	(0.586)	(0.648)	(0.507)	(0.598)	(0.891)
Probability Weighting	−0.124	−0.049	0.219	0.171	0.348
	(0.165)	(0.214)	(0.241)	(0.207)	(0.475)
High Card Acceptance	0.725*	0.998**	0.811*	0.852**	1.550
	(0.382)	(0.428)	(0.466)	(0.373)	(1.066)
Education	−0.038	−0.036	−0.040	0.007	−0.150
	(0.141)	(0.150)	(0.147)	(0.142)	(0.262)
Financial literacy	−0.006	0.015	−0.047	0.006	−0.016
	(0.124)	(0.136)	(0.149)	(0.121)	(0.256)
Numeracy	0.385***	0.261*	0.284**	0.334***	0.479*
	(0.129)	(0.146)	(0.142)	(0.119)	(0.270)
Trust	−0.230*	−0.114	−0.073	−0.156	−0.631**
	(0.122)	(0.132)	(0.132)	(0.114)	(0.246)
Interaction terms	Yes	Yes	Yes	Yes	Yes
Socioeconomic control variables	Yes	Yes	Yes	Yes	Yes
Behavioral control variables	No	No	No	No	No
Observations	902	826	952	996	961
Mean of dependent variable	3.391	3.407	3.367	3.367	0.924
Adjusted R^2	0.246	0.255	0.229	0.230	–
AIC	–	–	–	–	621.887
BIC	–	–	–	–	782.530

This table reports robustness checks for the U.S. sample. Columns 1–4 present OLS regressions using alternative sampling or outcome variable definitions. Column 5 reports a logit model with *Cash Holdings* as the dependent variable. Robust standard errors are reported in parentheses. All columns include socioeconomic controls for *Female*, 5-year *Age* category dummies,*Married*, *White*, *Hispanic*, ln(*Number of household members*), *Employed*, ln(*Family income*), ln(*Financial wealth*), and ln(*Housing wealth*). All nonbinary independent variables are standardized. All results use post-stratification weights.

*$p < .10$; **$p < .05$; ***$p < .01$.

Table A14: Risk attitudes and cash holdings – alternative risk and card acceptance measures

	Risk attitude (general)	Risk attitude (financial)	Barsky et al. utility curvature	Alternative card acceptance (incl. prepaid)
	(1)	(2)	(3)	(4)
Risk attitude – general	−0.016			
	(0.018)			
Risk attitude – financial		−0.024		
		(0.019)		
Barsky et al. utility curvature			0.771***	
			(0.230)	
Risk Aversion (Quartile 2)				0.139
				(0.512)
Risk Aversion (Quartile 3)				0.284
				(0.634)
Risk Aversion (Quartile 4)				0.439
				(0.600)
High Card Acceptance	−0.569	−1.604	3.961***	0.224
	(1.179)	(1.112)	(1.137)	(0.827)
High Card Acceptance prepaid				0.685
				(0.727)
Education	0.213	0.229	0.203	0.029
	(0.194)	(0.189)	(0.201)	(0.144)
Financial literacy	−0.113	−0.165	0.015	0.003
	(0.176)	(0.173)	(0.173)	(0.122)
Numeracy	0.463*	0.506**	0.253	0.336***
	(0.260)	(0.226)	(0.261)	(0.119)
Trust	−0.127	−0.175	−0.066	−0.151
	(0.202)	(0.199)	(0.188)	(0.114)
Interaction terms	Yes	Yes	Yes	Yes
Socioeconomic control variables	Yes	Yes	Yes	Yes
Behavioral control variables	No	No	No	No
Observations	287	287	316	989
Mean of dependent variable	3.371	3.371	3.371	3.371
Adjusted R^2	0.417	0.465	0.408	0.229

This table reports OLS regression results for the U.S. sample using alternative explanatory variables. Columns 1–3 use different measures of risk preferences (*Risk attitude – general*, *Risk attitude – financial*, and the *Barsky et al. (1997) utility curvature* measure). Column 4 replaces the main card-acceptance variable with an alternative measure that also counts prepaid cards. The dependent variable is ln(*Cash Holdings Amount*). All nonbinary independent variables are standardized. All results use post-stratification weights.

$^{*}p < .10$; $^{**}p < .05$; $^{***}p < .01$.

Table A15: Risk attitudes and cash holdings – alternative probability weighting measures

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Inverse-S Rank	0.640							
	(0.732)							
Above median Inverse-S Dummy		0.226						
		(0.434)						
Inverse-S Dummy			0.134					
			(0.527)					
Inverse-S (PW 88% + PW 75%) − (PW 25% + PW 12%)				0.197				
				(0.411)				
Inverse-S (PW 88% − PW 12%)					0.352			
					(0.645)			
Inverse-S – Prelec						0.095		
						(0.614)		
Inverse-S – TK							0.380	
							(0.473)	
Inverse-S – Salience theory								−0.162
								(0.608)
Education	0.005	0.004	0.013	−0.011	−0.012	−0.014	−0.033	0.015
	(0.144)	(0.143)	(0.145)	(0.141)	(0.143)	(0.145)	(0.144)	(0.143)
Financial literacy	−0.002	−0.005	−0.023	0.026	0.004	0.003	0.007	−0.004
	(0.121)	(0.123)	(0.122)	(0.124)	(0.122)	(0.124)	(0.126)	(0.123)
Numeracy	0.333***	0.332***	0.345***	0.347***	0.364***	0.330***	0.319**	0.336***
	(0.119)	(0.118)	(0.118)	(0.118)	(0.117)	(0.119)	(0.126)	(0.120)
Trust	−0.157	−0.167	−0.163	−0.156	−0.167	−0.177	−0.187	−0.160
	(0.115)	(0.114)	(0.115)	(0.114)	(0.113)	(0.115)	(0.115)	(0.115)
Interaction terms	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Socioeconomic control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Behavioral control variables	No	No	No	No	No	No	No	No
Observations	989	989	989	989	989	976	976	985
Mean of dependent variable	3.371	3.371	3.371	3.371	3.371	3.371	3.371	3.371
Adjusted R^2	0.227	0.224	0.216	0.233	0.225	0.210	0.205	0.210

This table reports OLS regression results for the U.S. sample using eight alternative measures of *Probability Weighting*. Columns 1–5 replicate the nonparametric probability weighting specifications. Columns 6–8 use the parametric measures *Inverse-S – Prelec*, *Inverse-S – TK*, and *Inverse-S – Salience theory*. The dependent variable is ln(*Cash Holdings Amount*). All nonbinary independent variables are standardized. All results use post-stratification weights.

$^{*}p < .10$; $^{**}p < .05$; $^{***}p < .01$.

Table A16: Risk attitudes and cash holdings – payment method characteristics, spending, and safety

	Controls for payment method characteristics	Outcome: Cash holdings / in-person expenditures	Controlling for spending	Safety concerns: Card/Cash stolen
	(1)	(2)	(3)	(4)
Risk Aversion				
Quartile 2	0.002	−5.609	−0.251	0.159
	(0.488)	(5.529)	(0.521)	(0.516)
Quartile 3	0.333	−3.813	0.047	0.396
	(0.597)	(4.946)	(0.697)	(0.606)
Quartile 4	0.269	−6.436	1.008	0.409
	(0.609)	(4.951)	(0.634)	(0.576)
Probability Weighting	0.143	−2.133	0.170	0.168
	(0.207)	(1.334)	(0.192)	(0.212)
High Card Acceptance	0.719*	−6.006	0.612	0.855**
	(0.375)	(4.951)	(0.448)	(0.372)
Payment method characteristics				
High Acquisition and Setup rating	−0.057			
	(0.263)			
High Convenience rating	−0.127			
	(0.246)			
High Cost rating	0.133			
	(0.245)			
High Payment Records rating	0.279			
	(0.426)			
High Security rating	0.402			
	(0.245)			
Safety concerns				
Card stolen or lost				−0.336
				(0.522)
Cash stolen or lost				−0.070
				(0.346)
Interaction terms	Yes	Yes	Yes	Yes
Socioeconomic control variables	Yes	Yes	Yes	Yes
Behavioral control variables	No	No	No	No
Observations	989	646	646	989
Mean of dependent variable	3.371	3.371	3.371	3.371
Adjusted R^2	0.239	0.196	0.236	0.230

This table reports OLS regression results for the U.S. sample. Column (1) adds controls for payment method characteristics: *Acquisition and Setup*, *Convenience*, *Cost*, *Payment records*, and *Security*. Column (2) expresses cash holdings as a share of total in-person expenditures. Column (3) includes ln(*Total in-person expenditures*) as an additional regressor. Column (4) adds indicators for *Card stolen or lost* and *Cash stolen or lost*. Robust standard errors are reported in parentheses. All columns include socioeconomic controls for *Female*, 5-year *Age* category dummies, *Married*, *White*, *Hispanic*, ln(*Number of household members*), *Employed*, ln(*Family income*), ln(*Financial wealth*), and ln(*Housing wealth*). All nonbinary independent variables are standardized. All results use post-stratification weights.

*$p < .10$; **$p < .05$; ***$p < .01$.

Appendix B – Swiss sample

B.1 Definition of variables and summary statistics

Table B1: Definition of variables Swiss sample

Variable	Definition	Unit	Source
Outcome variables			
Cash holdings amount	On-person cash holdings, excluding large-value holdings, i.e., total cash holdings of less than or equal to holdings of the 99th percentile	CHF	Survey question, variable *cashholdings*
Cash holdings	Dummy variable =1 if person has on-person cash holdings	[0;1]	Survey question, variable *cashholdings*
Alternative outcome variables			
Cash holdings amount – large-value	On-person cash holdings, including large-value holdings	CHF	Survey question, variable *cashholdings*
Explanatory variables			
Risk aversion	Index of overall risk aversion: Each choice situation in the asset allocation task posits a choice between 101 different portfolios with varying risk. Individuals are ranked according to how much risk they are willing to take relative to other individuals in the data. A composite measure is computed based on the full set of symmetric choice situations.	number	Choice situations
Early resolution of uncertainty	Dummy variable =1 if the person chooses to know the payment amount immediately at the end of the survey	[0;1]	Choice
Early resolution of uncertainty – negative emotion	Dummy variable =1 if the person states that his choice about the timing of the resolution of uncertainty is driven by anxiety or worry	[0;1]	Survey question, variable *negativeemotion*
Early resolution of uncertainty – positive emotion	Dummy variable =1 if the person states that his choice about the timing of the resolution of uncertainty is driven by enjoyment of the excitement of thinking about the payment amount	[0;1]	Survey question, variable *positiveemotion*
Early resolution of uncertainty – planning	Dummy variable =1 if the person states that his choice about the timing of the resolution of uncertainty is driven by a desire to consider the payment amount in his spending/savings planning	[0;1]	Survey question, variable *planning*
Card acceptance	Beliefs about card acceptance at the PoS: 1=”rarely accepted” and 5=”almost always accepted”	[1;..;5]	Survey question, variable *beliefcardacceptance*
High card acceptance	Dummy variable =1 if consumer rates the acceptance of debit or credit cards as ”almost always accepted” (highest answer option on a five-point Likert scale)	[0;1]	Survey question, variable *beliefcardacceptance*

The table shows the definition, unit, and source of all variables used in the Swiss sample analysis.

Variable	Definition	Unit	Source
Alternative risk measures			
Risk attitude – general	Self-reported risk attitude: 0=”very disposed to take risks” and 10=”not at all very disposed to take risks”	[0;..;10]	Survey question, variable *risksurvey*
Risky behavior	Risky behavior of person: 1=either smokes, drinks regularly, or engages in risky sports	[0;1]	Survey questions, variables *smokingstatus*, *drinkingstatus*, *riskysport*
Alternative subjective beliefs measures			
Early resolution of uncertainty – negative emotion	Self-reported rating of the motive ”anxiety/worry” for the person’s choice of timing of resolution of uncertainty: 0=”not important at all” and 10=”very important”	[0;..;10]	Survey question, variable *negativeemotion*
Early resolution of uncertainty – positive emotion	Self-reported rating of the motive ”positive emotion” for the person’s choice of timing of resolution of uncertainty: 0=”not important at all” and 10=”very important”	[0;..;10]	Survey question, variable *positiveemotion*
Early resolution of uncertainty – planning	Self-reported rating of the motive ”planning” for the person’s choice of timing of resolution of uncertainty: 0=”not important at all” and 10=”very important”	[0;..;10]	Survey question, variable *planning*
Socioeconomic control variables			
Age	Age of the person in years	number	Survey question, variable *age* or administrative data
Female	Gender of person: 0=male or divers, 1=female	[0;1]	Survey question, variable *gender*
Married	Marital status of person: 1=person reports being married or having a partner	[0;1]	Survey question, variable *maritalstatus* or administrative data
Number of children	Number of children of respondent	number	Survey question, variable *numberchildren* or administrative data
Employed	Occupational status of person: 1=employed. Employed is defined as working full or part-time	[0;1]	Survey question, variable *occustatus* or administrative data
Family income	Total income for all household members older than 15, including from jobs, business, farm, rental, pension benefits, dividends, interest, social security, and other income	in CHF 1’000	Survey question, variable *incomemonthly*
Financial wealth	The sum of checking and savings accounts, certificates of deposit (CDs), government and corporate bonds, Treasury bills, and stocks	in CHF 1’000	Survey question, variable *wealth*
Housing wealth	Dummy variable =1 if the person owns property	[0;1]	Administrative data
Housing space	Living space of primary residence	m^2	Survey question, variable *living*
Liquidity constrained	Difficulty of coming up with CHF 1’000 in case of unforeseen expenses: 1=difficult; 0=easy	[0;1]	Survey question, variable *living*

The table shows the definition, unit, and source of all variables used in the Swiss sample analysis.

Variable	Definition	Unit	Source
Vocational education and training	Education of person: 1=has a vocational degree or less (base category)	[0;1]	Survey question, variable *eduattain*
High school	Education of person: 1=has completed a maturity degree or less	[0;1]	Survey question, variable *eduattain*
Higher education	Education of person: 1=has completed a higher educational degree, a university degree or higher	[0;1]	Survey question, variable *eduattain*
Language region	Language region of person: 1=German, 2=French, or 3=Italian	[1;2;3]	Administrative data
Rural	Dummy variable =1 if location in which the person lives (ZIP code) has a population density of less than 3'000 inhabitants per km^2	[0;1]	Administrative data
Behavioral control variables			
Mood	Self-reported mood: 0="very happy, in very good mood" and 10="very unhappy, in very bad mood"	[0;..;10]	Survey question, variable *mood*
Patience	Self-reported patience: 0="very patient" and 10="very impatient"	[0;..;10]	Survey question, variable *patience*
Liquidity variable			
Deposits	Share of total wealth held as deposits in bank accounts	percent	Survey question, variable *wealthbank*

The table shows the definition, unit, and source of all variables used in the Swiss sample analysis.

Table B2: Summary statistics Swiss sample

Variable	Mean	Median	SD	Min	Max	N
Outcome variables						
Cash holdings amount	94.03	80.00	86.28	0.00	500	1'666
Cash holdings	0.95	1.00	0.22	0.00	1.00	1'666
Alternative outcome variables						
Cash holdings amount – large-value	99.28	80.00	115.50	0	2'000	1'682
Explanatory variables						
Risk aversion	0.50	0.50	0.29	0.00	1.00	1'666
Early resolution of uncertainty	0.33	0.00	0.47	0.00	1.00	1'666
Early resolution of uncertainty – negative emotion	0.10	0.00	0.29	0.00	1.00	1'666
Early resolution of uncertainty – positive emotion	0.27	0.00	0.44	0.00	1.00	1'666
Early resolution of uncertainty – planning	0.08	0.00	0.26	0.00	1.00	1'666
Card acceptance	4.22	4.00	0.56	1.00	5.00	1'666
High card acceptance*	0.95	1.00	0.22	0.00	1.00	1'666
Alternative risk measures						
Risk attitude – general	5.26	5.00	2.12	0.00	10.00	1'666
Risky behavior	0.34	0.00	0.47	0.00	1.00	1'666
Alternative subjective beliefs measures						
Negative emotion (continuous scale)	1.17	0.00	1.99	0.00	10.00	1'666
Positive emotion (continuous scale)	2.39	1.00	2.83	0.00	10.00	1'666
Planning (continuous scale)	0.87	0.00	1.87	0.00	10.00	1'666

This table reports summary statistics for the variables used in my study of the Swiss sample.
*this variable has not been preregistered.

Variable	Mean	Median	SD	Min	Max	N
Socioeconomic control variables						
Age	46.40	46.00	13.28	22.00	75.00	1'666
Female	0.38	0.00	0.48	0.00	1.00	1'666
Married	0.43	0.00	0.50	0.00	1.00	1'666
Number of children	3.87	3.00	2.05	1.00	6.00	1'666
Employed	0.81	1.00	0.40	0.00	1.00	1'666
Family income	2.92	3.00	1.18	1.00	5.00	1'666
Financial wealth	551.18	150	2'039.94	0.00	60'000	1'666
Housing wealth	0.50	0.00	0.50	0.00	1.00	1'666
Housing space	131.43	120.00	193.68	0.00	7'486	1'666
Liquidity constrained	0.12	0.00	0.32	0.00	1.00	1'666
Vocational education and training	0.04	0.00	0.19	0.00	1.00	1'666
High school	0.37	0.00	0.48	0.00	1.00	1'666
Higher education	0.60	1.00	0.49	0.00	1.00	1'666
Language region	1.26	1.00	0.54	1.00	3.00	1'666
Rural	0.16	0.00	0.37	0.00	1.00	1'666
Behavioral control variables						
Mood	7.37	8.00	1.64	1.00	10.00	1'666
Patience	4.57	5.00	2.43	0.00	10.00	1'666
Liquidity variable						
Deposits	46.24	33.00	35.80	0.00	100.00	1'666

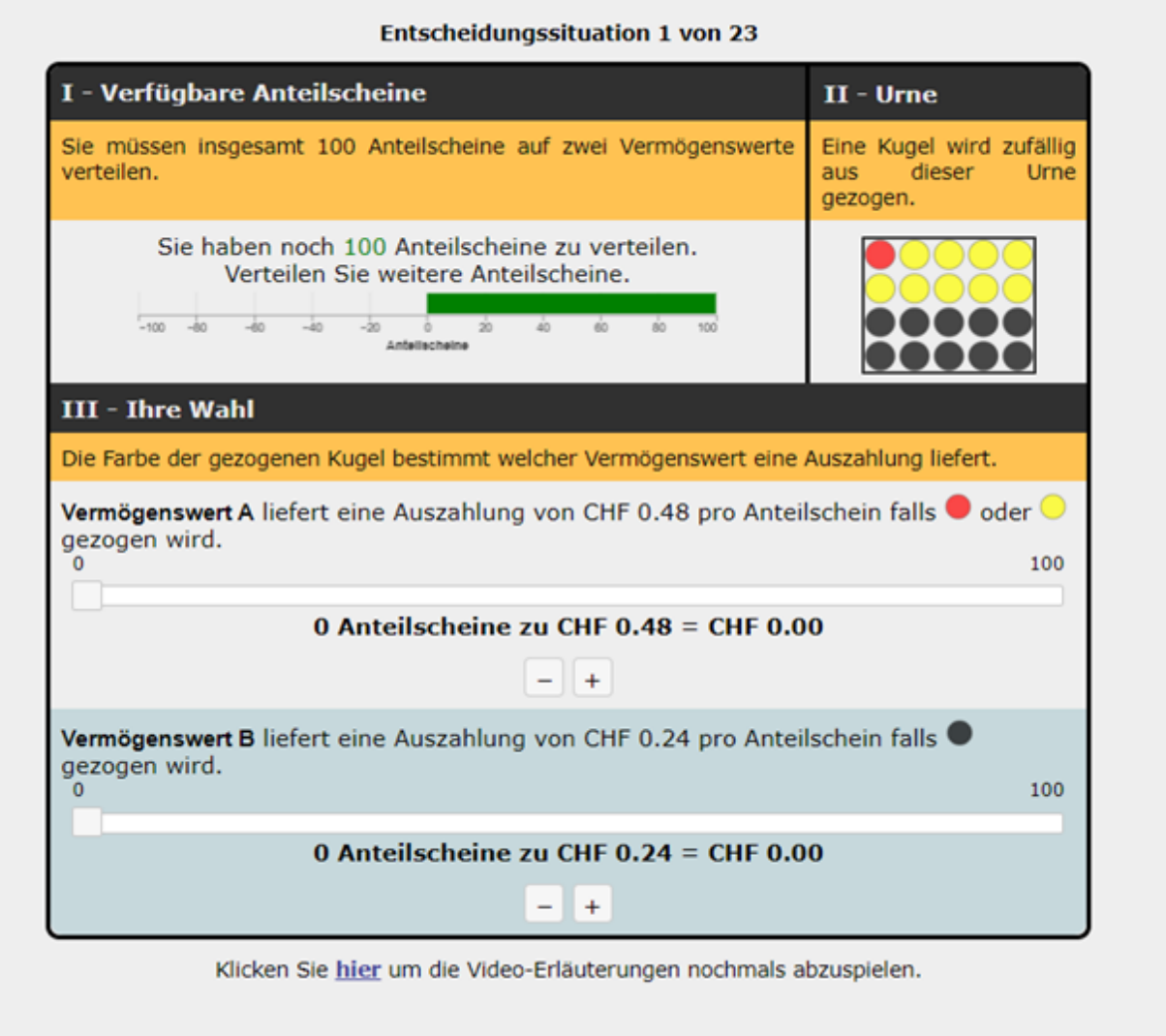
This table reports summary statistics for the variables used in my study of the Swiss sample.

B.2 The elicitation procedure for risk preferences, subjective beliefs, and behavioral control variables

We present the survey participants with an asset allocation task consisting of a sequence of 23 choice situations (Biener and Epper, 2023). In each choice situation, individuals have an initial endowment of 100 shares to distribute among two assets A and B. The assets yield state-contingent returns which are determined by a ball being drawn from an urn.

Figure B1 shows an example of a choice situation (in German).

Figure B1: Example of a choice situation



Example of a choice situation presented to participants in the online survey of the Swiss sample.Source: Biener and Epper (2023).

Biener and Epper (2023) calibration is based on 10 base choice situations. The authors use two probability conditions:

1. Symmetric: The probability of each event to occur is 50%.

2. Asymmetric: The probability of the event associated with the higher return is 5%.

There are 10 symmetric (base) choice situations, 10 asymmetric choice situations, and 3 symmetric replication choice situations (a total of 10 + 10 + 3 = 23). See Biener and Epper (2023) Appendix C for a detailed description of the asset allocation task. From these choice situations, the following variables are constructed:

Survey questions of alternative explanatory variables

Risk aversion

Index of overall risk aversion. Each choice situation in the asset allocation task posits a choice between 101 different portfolios with varying risk. Individuals are ranked according to how much risk they are willing to take relative to other individuals in the data. A composite measure is computed based on the full set of symmetric choice situations.

Contrary to the pre-analysis plan, the variables *Positive skewness*, *Indices of decision-making quality*, and *Disappointment aversion* are not used in the analysis.

B.3 The elicitation procedure for *Early resolution of uncertainty* and associated anticipatory feelings

Early resolution of uncertainty

To elicit an incentivized preference measure for the timing of resolution of uncertainty, at the end of the experiment, participants have the option to resolve uncertainty about their payment for participating in this study directly or wait for two weeks to receive the information on study payment, including the resolution of uncertainty from the incentivized risk and belief tasks, for an additional CHF 2. Importantly, the effective transfer of the payout is independent of this choice, i.e., study participants receive the payment amount about two weeks after the survey in either case. The binary response variable provides an estimate for the preference parameter and takes the value of 1 if the respondent chooses to know the payout amount immediately. See Biener and Epper (2023) Appendix E for a transcript of the choice situation.

To elicit the motives behind participants' choices about the timing of resolution of uncertainty, Biener and Epper (2023) ask participants whether negative or positive emotions or planning motives were driving their choices. The questions are adapted from Kocher et al. (2014). The original questions are in German, French, or Italian, conditional on the language selection of the participant. The original variable names are shown in brackets.

Introduction

You may have had several different reasons to decide the way you did. For each of the reasons mentioned below, please indicate on the attached scale (ranging from 1 = "not important at all" to 10 = "very important") how important this reason was to you.

Early resolution of uncertainty – negative emotion [negativeemotion]

"I thought I would worry about the possibility of not winning anything or very little and wanted to get over it as soon as possible."

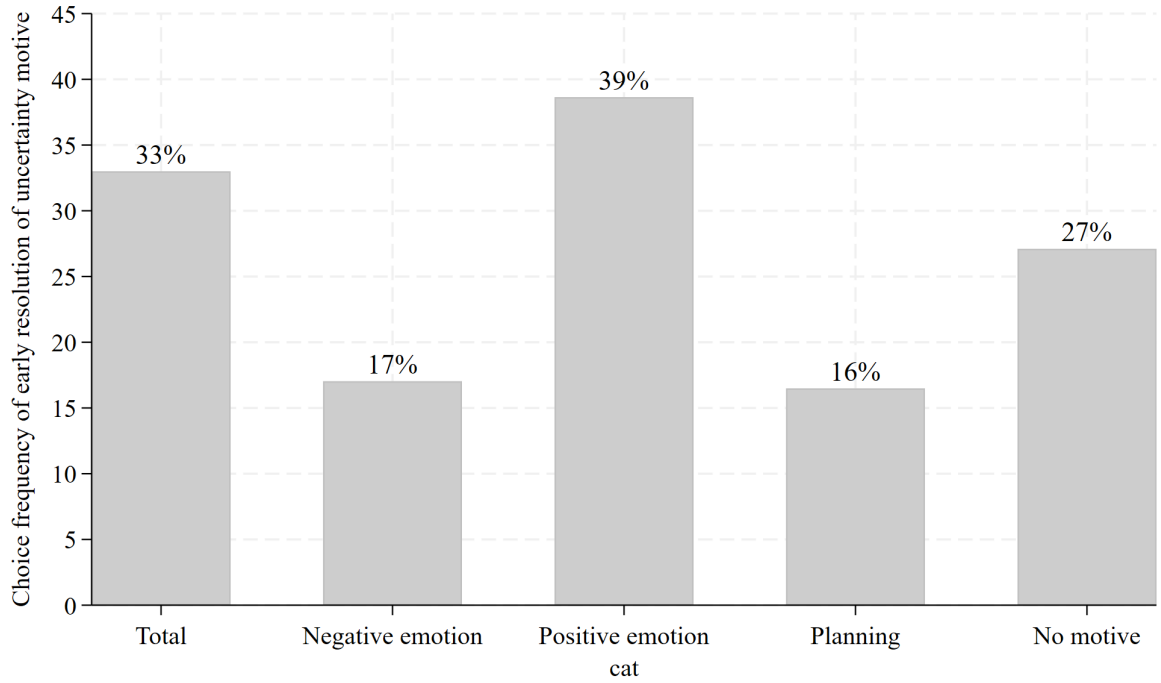
Early resolution of uncertainty – positive emotion [positiveemotion]

"I thought I would cherish the hope or enjoy the excitement of thinking about the winnings."

Early resolution of uncertainty – planning [planning]

"I wanted to include the payout amount in my spending planning/savings planning as soon as possible."

Figure B2: Early resolution of uncertainty and its motives



This figure displays the share of respondents that chose early resolution of uncertainty conditional on the stated motive. The sample size is $N = 1'666$.

B.4 Survey questions of variables

These are the survey questions by Biener and Epper (2023) for the dependent and independent variables *Cash holdings amount* and *Card acceptance* in English. The original questions are in German, French, or Italian, conditional on language selection of the participant. The original variable names are in brackets.

Outcome variable

Cash holdings amount [cashholdings]

The question on cash holdings is taken from the Swiss National Bank's Survey on Payment Methods 2020 (SNB, 2020): "About how much cash do you have in your wallet, purse and/or pocket?"

Explanatory variable

Card acceptance [beliefcardacceptance]

This question on the belief whether payment cards are accepted at the PoS is adapted from the U.S. 2021 Diary of Consumer Payment Choice of the Atlanta Fed (Foster et al., 2022): "Please rate how likely a debit or credit card or a payment app is to be accepted for payment."

1) Rarely accepted
2) Occasionally accepted
3) Often accepted
4) Usually accepted
5) Almost always accepted

Alternative risk measures

Risky behavior

To construct the variable risky behavior, I combine three questions on smoking, drinking, and risky sports:

Smoking [smokingstatus]

"Rauchen oder dampfen (vapen) Sie, wenn auch nur selten?"

1) Ja

2) Nein

Drinking [drinkingstatus]

"Wie häufig trinken Sie normalerweise alkoholische Getränke, also Bier, Wein, Likör, Aperitif, Spirituosen, Schnaps?"

1) 3 Mal oder mehr pro Tag

2) 2 Mal pro Tag (zu Mahlzeiten)

3) 1 Mal pro Tag

4) Mehrmals pro Woche

5) 1–2 Mal pro Woche

6) 1–3 Mal pro Monat

7) Weniger als 1 Mal pro Monat

8) Nie (abstinent)

Risky sports [sportsriskysports]

"Betreiben Sie regelmässig eine oder mehrere Sportarten, die man als Risikosportarten bezeichnen würde?"

1) Ja

2) Nein

Risk attitude [risksurvey]

"Sind Sie im Allgemeinen bereit, Risiken einzugehen oder versuchen Sie Risiken zu vermeiden?" (0 = sehr bereit, Risiken einzugehen, 10 = überhaupt nicht bereit, Risiken einzugehen)

Socioeconomic control variables

For the survey questions of socioeconomic control variables, see Biener and Epper (2023), Appendix F.

Behavioral control variables

Mood [mood]

"Wie fühlen Sie sich?" (0 = sehr glücklich / in sehr guter Stimmung, 10 = sehr unglücklich / in sehr schlechter Stimmung)

Patience [patience]

"Sind Sie im Allgemeinen eine ungeduldige Person oder jemand, der viel Geduld hat?" (0 = sehr geduldig, 10 = sehr ungeduldig)

Liquidity variable

Deposits [wealthbank]

"Bitte schätzen Sie den Anteil Ihres Vermögens in den folgenden Kategorien:"

[wealthstocks]: Aktien & Derivate: __%

[wealthbonds]: Anleihen / Bonds: __%

[wealthbank]: Bankkonto: __%

[wealthreal]: Immobilien: __%

[wealthother]: Anderes: __%

Variable for subsample analysis

Payment mode [paymentmode]

To split the sample according to payment behavior, I use information on how the respondent usually pays. The question is taken from the Swiss National Bank's Survey on Payment Methods 2020 (SNB, 2020):

"How do you generally pay for everyday expenses (e.g., food shopping)?"

1) Always cash

2) Usually cash

3) Both cash and cashless

4) Usually cashless

5) Always cashless

Attention check [attentioncheck]

“Bei der nächsten Frage geht es um das folgende Problem. In Befragungen wie dieser gibt es manchmal Teilnehmer, welche die Fragen nicht genau lesen und nur rasch durch den Fragebogen klicken. Dadurch gibt es viele Zufallsantworten, welche die Ergebnisse der Studie verfälschen. Um zu zeigen, dass Sie unsere Fragen aufmerksam lesen, bitten wir Sie daher bei der nächsten Frage ‘Sehr stark’ als Antwort anzugeben. Wie stark interessieren Sie sich für Flusskrebse?”

1) Gar nicht

2) Eher nicht

3) Mittelmässig

4) Eher ja

5) Sehr stark

B.5 Risk attitudes, preferences for early resolution of uncertainty and cash holdings – full results

Table B3: Cash holdings, risk aversion, and preferences for early resolution of uncertainty – full results

	Cash Holdings		ln***(Cash Holdings Amount)***	
	(1)	(2)	(3)	(4)
Risk Aversion	0.013**	0.012	0.032	0.032
	(0.006)	(0.011)	(0.032)	(0.113)
Early resolution of uncertainty	−0.008	−0.007	−0.012	−0.346
	(0.012)	(0.033)	(0.068)	(0.243)
High card acceptance	−0.031*	−0.031	−0.256**	−0.376***
	(0.016)	(0.019)	(0.111)	(0.124)
Risk Aversion * High card acceptance		0.001		0.000
		(0.012)		(0.117)
Early resolution of uncertainty * High card acceptance		−0.001		0.352
		(0.035)		(0.250)
Mood	0.001	0.001	0.019	0.020
	(0.006)	(0.006)	(0.032)	(0.032)
Patience	−0.012**	−0.012**	−0.073**	−0.073**
	(0.006)	(0.006)	(0.032)	(0.032)
Female	0.042***	0.042***	0.013	0.012
	(0.012)	(0.012)	(0.071)	(0.071)
Married	−0.001	−0.001	−0.085	−0.085
	(0.014)	(0.014)	(0.080)	(0.080)
Number of children	0.011	0.011	0.069*	0.067*
	(0.007)	(0.007)	(0.039)	(0.040)
Employed	−0.010	−0.010	−0.096	−0.094
	(0.016)	(0.016)	(0.102)	(0.102)
Family income	−0.011	−0.011	−0.014	−0.014
	(0.008)	(0.008)	(0.044)	(0.044)
Financial wealth	0.016*	0.016*	0.247***	0.246***
	(0.009)	(0.009)	(0.049)	(0.049)
Housing wealth	0.021	0.021	0.083	0.086
	(0.014)	(0.014)	(0.083)	(0.082)
Housing space	0.006	0.006	0.047	0.043
	(0.008)	(0.008)	(0.045)	(0.043)

	Cash Holdings		ln(*Cash Holdings Amount*)	
	(1)	(2)	(3)	(4)
Liquidity constrained	−0.001	−0.001	−0.266**	−0.271**
	(0.022)	(0.022)	(0.115)	(0.115)
Education	−0.007	−0.007	−0.043	−0.042
	(0.006)	(0.006)	(0.034)	(0.034)
Language region	0.002	0.002	−0.018	−0.016
	(0.009)	(0.009)	(0.070)	(0.070)
Rural	0.010	0.010	0.231***	0.234***
	(0.014)	(0.014)	(0.087)	(0.087)
Age 20-25	−0.018	−0.018	−0.172	−0.173
	(0.036)	(0.036)	(0.198)	(0.198)
Age 31-35	−0.014	−0.014	0.065	0.061
	(0.027)	(0.027)	(0.143)	(0.143)
Age 36-40	−0.031	−0.031	−0.088	−0.089
	(0.028)	(0.028)	(0.148)	(0.148)
Age 41-45	−0.001	−0.001	0.192	0.196
	(0.026)	(0.026)	(0.146)	(0.146)
Age 46-50	0.017	0.017	0.410***	0.409***
	(0.025)	(0.025)	(0.142)	(0.142)
Age 51-55	0.043*	0.043*	0.556***	0.553***
	(0.024)	(0.024)	(0.145)	(0.145)
Age 56-60	0.025	0.025	0.460***	0.465***
	(0.024)	(0.024)	(0.142)	(0.142)
Age 61-65	0.033	0.033	0.714***	0.711***
	(0.022)	(0.022)	(0.141)	(0.141)
Age 66-70	0.019	0.019	0.620***	0.619***
	(0.027)	(0.027)	(0.168)	(0.168)
Age 71-75	0.031	0.031	1.031***	1.040***
	(0.032)	(0.032)	(0.190)	(0.191)
Constant	0.943***	0.898***	4.160***	3.726***
	(0.049)	(0.058)	(0.327)	(0.327)
Labor market area controls	Yes	Yes	Yes	Yes
Observations	1'666	1'666	1'666	1'666
Mean of dependent variable	0.948	0.948	3.99	3.99
Adjusted R^2	0.032	0.031	0.139	0.139

This table reports OLS regression results. The dependent variable is either *Cash Holdings* (columns 1–2) or ln(*Cash Holdings Amount*) (columns 3–4). Robust standard errors are reported in parentheses. All columns include labor market area controls. All nonbinary independent variables are standardized. Data source: Swiss sample.

$^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

Table B4: Cash holdings, risk aversion, and preferences for early resolution of uncertainty – full results card payers

	Cash Holdings		ln***(Cash Holdings Amount)***	
	(1)	(2)	(3)	(4)
Risk Aversion	0.018**	−0.002	0.077*	−0.046
	(0.009)	(0.017)	(0.043)	(0.176)
Early resolution of uncertainty	−0.006	0.007	0.013	−0.633*
	(0.019)	(0.030)	(0.094)	(0.384)
High card acceptance	−0.062***	−0.061***	−0.245	−0.494***
	(0.017)	(0.020)	(0.176)	(0.173)
Risk Aversion * High card acceptance		0.021		0.124
		(0.019)		(0.181)
Early resolution of uncertainty * High card acceptance		−0.013		0.664*
		(0.036)		(0.396)
Mood	0.000	0.000	−0.010	−0.010
	(0.009)	(0.009)	(0.045)	(0.045)
Patience	−0.014*	−0.014*	−0.080*	−0.081*
	(0.008)	(0.008)	(0.043)	(0.043)
Female	0.054***	0.054***	0.107	0.107
	(0.019)	(0.019)	(0.096)	(0.096)
Married	0.014	0.014	0.014	0.016
	(0.022)	(0.022)	(0.111)	(0.111)
Number of children	0.020*	0.020*	0.125**	0.123**
	(0.012)	(0.012)	(0.057)	(0.057)
Employed	−0.013	−0.012	−0.147	−0.150
	(0.028)	(0.028)	(0.156)	(0.156)
Family income	−0.010	−0.010	0.049	0.050
	(0.012)	(0.012)	(0.060)	(0.060)
Financial wealth	0.029**	0.030**	0.323***	0.321***
	(0.014)	(0.014)	(0.070)	(0.070)
Housing wealth	0.033	0.033	0.094	0.095
	(0.023)	(0.023)	(0.120)	(0.120)
Housing space	−0.000	0.000	0.057	0.054
	(0.010)	(0.010)	(0.058)	(0.056)
Liquidity constrained	0.029	0.029	−0.150	−0.154
	(0.032)	(0.032)	(0.153)	(0.153)

	Cash Holdings		ln(*Cash Holdings Amount*)	
	(1)	(2)	(3)	(4)
Education	−0.005	−0.005	−0.056	−0.055
	(0.008)	(0.008)	(0.046)	(0.046)
Language region	0.018	0.018	0.045	0.047
	(0.013)	(0.013)	(0.103)	(0.103)
Rural	0.017	0.016	0.098	0.108
	(0.023)	(0.023)	(0.123)	(0.125)
Age 20–25	−0.026	−0.026	−0.130	−0.131
	(0.053)	(0.053)	(0.257)	(0.258)
Age 31–35	−0.014	−0.013	0.044	0.045
	(0.038)	(0.038)	(0.182)	(0.182)
Age 36–40	−0.028	−0.028	−0.002	0.002
	(0.040)	(0.040)	(0.193)	(0.194)
Age 41–45	−0.013	−0.013	0.142	0.146
	(0.038)	(0.038)	(0.187)	(0.187)
Age 46–50	0.010	0.009	0.493**	0.503**
	(0.038)	(0.039)	(0.197)	(0.198)
Age 51–55	0.035	0.034	0.465**	0.474**
	(0.038)	(0.038)	(0.203)	(0.203)
Age 56–60	0.020	0.019	0.401*	0.408*
	(0.041)	(0.041)	(0.212)	(0.212)
Age 61–65	0.029	0.028	0.699***	0.692***
	(0.037)	(0.037)	(0.205)	(0.206)
Age 66–70	0.001	0.001	0.526**	0.525**
	(0.047)	(0.047)	(0.256)	(0.256)
Age 71–75	0.012	0.012	1.131***	1.140***
	(0.052)	(0.052)	(0.270)	(0.271)
Constant	0.781***	0.880***	2.737***	3.628***
	(0.151)	(0.090)	(0.584)	(0.473)
Labor market area controls	Yes	Yes	Yes	Yes
Observations	1'014	1'014	1'014	1'014
Mean of dependent variable	0.923	0.923	3.720	3.720
Adjusted R^2	0.032	0.030	0.143	0.142

This table reports OLS regression results for the subsample of respondents who indicated that they mostly pay by card. The dependent variable is either *Cash Holdings* (columns 1–2) or ln(*Cash Holdings Amount*) (columns 3–4). Robust standard errors are reported in parentheses. All columns include labor market area controls. All nonbinary independent variables are standardized. Data source: Swiss sample.

$^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

Table B5: Motives for early resolution of uncertainty

	ln(***Cash Holdings Amount***)		
	(1)	(2)	(3)
Risk aversion	−0.011	−0.010	−0.015
	(0.054)	(0.055)	(0.054)
Early resolution – negative emotion	−0.211		
	(0.187)		
Early resolution – positive emotion		−0.142	
		(0.123)	
Early resolution – planning			−0.114
			(0.176)
High card acceptance	−0.229	−0.220	−0.237
	(0.213)	(0.216)	(0.218)
Mood	0.063	0.066	0.063
	(0.055)	(0.055)	(0.055)
Patience	−0.091	−0.084	−0.089
	(0.056)	(0.057)	(0.056)
Socioeconomic control variables	Yes	Yes	Yes
Labor market area controls	Yes	Yes	Yes
Observations	546	546	546
Mean of dependent variable	3.949	3.949	3.949
Adjusted R^2	0.175	0.175	0.173

This table reports OLS regression results for a subsample of respondents who indicated that they prefer early resolution of uncertainty. The dependent variable is ln(*Cash Holdings Amount*). Robust standard errors are reported in parentheses. All specifications include socioeconomic controls (5-year *age* dummies, *female*, *married*, *number of children*, *employment status*, ln(*family income*), ln(*financial wealth*), *housing wealth*, ln(*housing space*), *education*, *language region*, *rural*), behavioral controls (*mood*, *patience*), and labor market area controls. All nonbinary independent variables are standardized. Data source: Swiss sample.

$^{*}p < .10$; $^{**}p < .05$; $^{***}p < .01$.

B.6 Robustness checks for the Swiss sample

Table B6: Overview of robustness checks for the Swiss sample

Dimension	Description and findings
Preregistered	
Sampling criteria	Excluding inattentive respondents does not change results.
Outcome variables	Including large-value cash holdings leaves results unchanged.
Explanatory variables (risk preferences)	Using self-reported general risk attitudes or risky behavior yields similar null results.
Estimation methods	Tobit model (for bounded *Cash Holdings Amount*) and logit model (for binary *Cash Holdings*) both confirm main results, except for *Risk aversion*, which becomes significant for *Cash Holdings*.
Non-preregistered	
Liquidity-constrained consumers	Restricting the sample to liquidity-constrained consumers does not alter the results; *High card acceptance* also becomes insignificant.

The table summarizes preregistered and non-preregistered robustness checks for the Swiss sample analysis.

Table B7: Cash holdings, risk aversion, and preferences for early resolution of uncertainty – subsample of respondents who answered the attention question correctly

	Cash Holdings		ln***(Cash Holdings Amount)***	
	(1)	(2)	(3)	(4)
Risk aversion	0.010	0.001	−0.007	−0.135
	(0.006)	(0.011)	(0.035)	(0.107)
Early resolution of uncertainty	−0.006	−0.004	−0.030	−0.172
	(0.014)	(0.016)	(0.075)	(0.231)
High card acceptance	−0.050***	−0.050***	−0.330***	−0.394***
	(0.010)	(0.036)	(0.110)	(0.396)
Risk Aversion * High card acceptance		0.010		0.132
		(0.012)		(0.112)
Early resolution of uncertainty * High card acceptance		−0.002		0.147
		(0.021)		(0.242)
Mood	0.003	0.003	0.044	0.045
	(0.006)	(0.006)	(0.036)	(0.036)
Patience	−0.014**	−0.014**	−0.080**	−0.080**
	(0.006)	(0.006)	(0.035)	(0.035)
Female	0.037***	0.037***	−0.001	0.002
	(0.014)	(0.014)	(0.082)	(0.082)
Married	0.002	0.002	−0.061	−0.061
	(0.015)	(0.016)	(0.088)	(0.089)
Number of children	0.013	0.013	0.076*	0.074*
	(0.008)	(0.008)	(0.045)	(0.045)
Employed	−0.022	−0.021	−0.234**	−0.229**
	(0.017)	(0.017)	(0.112)	(0.112)
Family income	−0.008	−0.008	−0.004	−0.004
	(0.009)	(0.009)	(0.051)	(0.051)
Financial wealth	0.018	0.018	0.257***	0.258***
	(0.011)	(0.011)	(0.060)	(0.060)
Housing wealth	0.018	0.018	0.088	0.090
	(0.016)	(0.016)	(0.093)	(0.093)
Housing space	0.001	0.001	−0.013	−0.015
	(0.007)	(0.007)	(0.041)	(0.041)
Liquidity constrained	0.003	0.003	−0.305**	−0.307**
	(0.026)	(0.026)	(0.139)	(0.139)

	Cash Holdings		ln(*Cash Holdings Amount*)	
	(1)	(2)	(3)	(4)
Education	−0.010	−0.010	−0.052	−0.052
	(0.007)	(0.007)	(0.041)	(0.041)
Language region	−0.001	−0.002	0.002	0.000
	(0.009)	(0.009)	(0.082)	(0.082)
Rural	0.013	0.013	0.236**	0.234**
	(0.016)	(0.016)	(0.099)	(0.099)
Age 20–25	−0.021	−0.021	−0.246	−0.247
	(0.038)	(0.038)	(0.215)	(0.215)
Age 31–35	−0.012	−0.012	0.059	0.063
	(0.028)	(0.028)	(0.150)	(0.151)
Age 36–40	−0.019	−0.019	−0.078	−0.078
	(0.030)	(0.030)	(0.160)	(0.160)
Age 41–45	0.001	0.001	0.217	0.218
	(0.028)	(0.028)	(0.158)	(0.158)
Age 46–50	0.019	0.019	0.460***	0.455***
	(0.027)	(0.027)	(0.154)	(0.155)
Age 51–55	0.051**	0.051**	0.571***	0.571***
	(0.026)	(0.026)	(0.159)	(0.159)
Age 56–60	0.024	0.024	0.505***	0.509***
	(0.028)	(0.028)	(0.164)	(0.164)
Age 61–65	0.032	0.032	0.741***	0.738***
	(0.025)	(0.025)	(0.157)	(0.158)
Age 66–70	0.010	0.011	0.537***	0.541***
	(0.032)	(0.032)	(0.191)	(0.192)
Constant	0.984***	0.895***	4.163***	3.835***
	(0.053)	(0.072)	(0.374)	(0.393)
Labor market area controls	Yes	Yes	Yes	Yes
Observations	1’333	1’333	1’333	1’333
Mean of dependent variable	0.947	0.947	3.972	3.972
Adjusted R^2	0.023	0.021	0.140	0.139

This table reports OLS regression results for the subsample of respondents who that answered the attention question correctly. The dependent variable is either *Cash Holdings* (columns 1–2) or ln(*Cash Holdings Amount*) (columns 3–4). Robust standard errors are reported in parentheses. All columns include labor market area controls. All nonbinary independent variables are standardized. Data source: Swiss sample.

$^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

Table B8: Cash holdings, risk aversion, and preferences for early resolution of uncertainty – robustness checks

	Outcome: ***Cash Holdings Amount*** **(large-value)**	**Explanatory:** ***Risk attitude*** **(general)**	**Explanatory:** ***Risk attitude*** **– risky behavior**	**Logit model:** ***Cash Holdings***	**Tobit model:** ***Cash Holdings Amount***
Risk aversion	0.032			0.812**	0.032
	(0.113)			(0.307)	(0.111)
Risk attitude – general		−0.119			
		(0.122)			
Risky behavior			−0.126		
			(0.223)		
Early resolution of uncertainty	−0.341	−0.344	−0.347	−0.056	−0.346
	(0.244)	(0.242)	(0.246)	(1.216)	(0.239)
High card acceptance	−0.359***	−0.358***	−0.433***	−1.102	−0.376**
	(0.124)	(0.126)	(0.140)	(0.873)	(0.123)
Mood	0.021	0.018	0.019	0.051	0.020
	(0.033)	(0.032)	(0.032)	(0.119)	(0.032)
Patience	−0.071**	−0.073**	−0.073**	−0.264*	−0.073*
	(0.032)	(0.032)	(0.032)	(0.118)	(0.031)
Interaction terms	Yes	Yes	Yes	Yes	Yes
Socioeconomic control variables	Yes	Yes	Yes	Yes	Yes
Labor market area controls	Yes	Yes	Yes	Yes	Yes
Observations	1'675	1'666	1'666	1'562	1'666
Mean of dependent variable	4.004	3.988	3.988	0.948	3.988
Adjusted R^2	0.139	0.138	0.138		
AIC				658.447	5'517.428
BIC				877.949	5'761.246

This table reports OLS, Logit, and Tobit regression results. The dependent variable is either ln(*Cash Holdings Amount*) (columns 1, 2, 3, and 5) or *Cash Holdings* (column 4). Robust standard errors are reported in parentheses. All columns include socioeconomic controls for *female*, 5-year *age category dummies*, *married*, *white*, ln(*number of household members*), *employment status*, ln(*family income*), ln(*financial wealth*), and ln(*housing wealth*). All nonbinary independent variables are standardized. Data source: Swiss sample.

*$p < .05$; **$p < .01$; ***$p < .001$.

Table B9: Cash holdings, risk aversion, and preferences for early resolution of uncertainty – liquidity constrained consumers

	Cash Holdings		ln***(Cash Holdings Amount)***	
	(1)	(2)	(3)	(4)
Risk aversion	−0.005	0.046	−0.110	0.367
	(0.019)	(0.063)	(0.106)	(0.249)
Early resolution of uncertainty	−0.034	0.097	−0.312	0.687
	(0.042)	(0.122)	(0.208)	(0.453)
High card acceptance	−0.003	0.050	−0.128	0.293
	(0.064)	(0.092)	(0.304)	(0.388)
Risk aversion * High card acceptance		−0.053		−0.501*
		(0.065)		(0.274)
Early resolution of uncertainty * High card acceptance		−0.140		−1.062**
		(0.127)		(0.496)
Mood	0.003	0.005	0.080	0.094
	(0.014)	(0.014)	(0.088)	(0.088)
Patience	−0.001	−0.001	−0.018	−0.018
	(0.013)	(0.013)	(0.079)	(0.080)
Socioeconomic control variables	Yes	Yes	Yes	Yes
Labor market area controls	Yes	Yes	Yes	Yes
Observations	198	198	198	198
Mean of dependent variable	0.939	0.939	3.377	3.377
Adjusted R^2	0.042	0.037	0.124	0.129

This table reports OLS regression results for the subsample of respondents classified as liquidity constrained. The dependent variable is either *Cash Holdings* (columns 1–2) or ln(*Cash Holdings Amount*) (columns 3–4). Robust standard errors are reported in parentheses. All columns include socioeconomic controls (5-year *age* dummies, *female*, *married*, *number of children*, *employment status*, *family income*, *financial wealth*, *housing wealth*, *housing space*, *education*, *language region*, *rural*), behavioral controls (*mood*, *patience*), and labor market area controls. All nonbinary independent variables are standardized. Data source: Swiss sample.

$^{*}p < .10$; $^{**}p < .05$; $^{***}p < .01$.

B.7 Cash holdings and liquidity demand

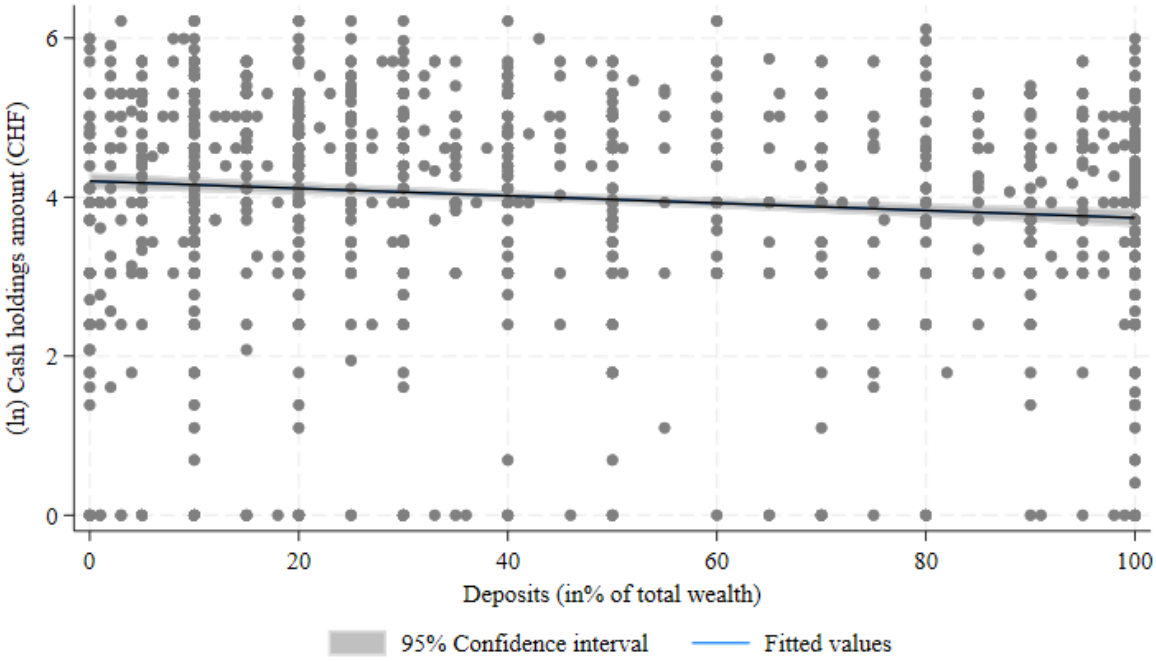
In household finance, several standard (e.g., Greene and Stavins, 2023; Gross and Souleles, 2002; Telyukova, 2013) and behavioral explanations (e.g., Bertaut et al., 2009; Gathergood and Weber, 2014) have been put forward to explain the "credit card debt puzzle": the fact that consumers choose to revolve unsecured high-interest credit card debt while also holding low interest-bearing liquid assets that could be used to pay down that debt. Telyukova (2013) suggests households may hold liquid assets to make purchases for which consumer credit cannot be used such as mortgage or rent payments. Thus, in her model, the demand for liquidity is mainly driven by precautionary motives. Greene and Stavins (2023) confirm this liquidity-need hypothesis using recent U.S. consumer payments diary data.

Thus, if consumers hold cash for precautionary motives, they are expected to not only carry cash balances on them but additionally to hold a considerable share of their wealth as liquid assets such as bank deposits. To investigate whether cash holdings are related to a preference for liquidity, I consider the self-reported share of total wealth held as bank deposits of the respondent (*Deposits*). Therefore, I conjecture:

H6: Consumers who carry larger cash amounts on them are expected to hold larger shares of their total wealth as liquidity in bank accounts.

However, Figure B3 as well as unreported regression results do not confirm the hypothesized relationships between liquidity and cash holdings. If anything, the results point to an inverse relationship.

Figure B3: Cash holdings and liquidity demand



This figure displays the association between the amount of cash holdings and the share of wealth a respondent holds as deposits in his bank account. The sample size is $N = 1'666$.

Appendix C – Swiss National Bank sample

C.1 Definition of variables and summary statistics

Table C1: Definition of variables SNB sample

Variable	Definition	Unit
Outcome variables		
Cash holdings amount	On-person cash holdings, excluding large-value holdings, i.e., total cash holdings of less than or equal to holdings of the 99th percentile	CHF
Cash holdings	Dummy variable =1 if person has on-person cash holdings	[0;1]
Alternative outcome variables		
Cash holdings amount – large-value	On-person cash holdings, including large-value holdings	CHF
Explanatory variables		
Risk aversion	Combined measure of risk-taking behavior based on quantitative and qualitative survey items. The quantitative component is derived from five choice situations with varying probabilities and payouts; the qualitative component is based on self-reported willingness to take risks on a 0–10 scale. Higher values imply greater willingness to take risks.	Continuous
Card acceptance	Belief about card acceptance at the point of sale, based on the question: "Please rate how likely a debit or credit card or a payment app is to be accepted for payment." Takes values from 1 = "rarely accepted" to 5 = "almost always accepted."	[1;..;5]
High Card Acceptance	Dummy variable equal to 1 if respondent rates the acceptance of debit or credit cards as "almost always accepted" (highest answer option), and 0 otherwise.	[0;1]
Alternative explanatory variables		
Risk attitude – general	Self-reported risk attitude based on the survey question: "In general, how willing are you to take risks?" Answers are given on a 0–10 scale, where 0 = "completely unwilling to take risks" and 10 = "very willing to take risks."	[0;..;10]
Socioeconomic control variables		
Age	Age of respondent in years. Used as 5-year age groups in regressions.	continuous
Female	Dummy = 1 if respondent is female, 0 otherwise.	[0;1]
German speaking	Dummy = 1 if German language chosen by respondent for the survey.	[0;1]
Household income	Household income group: 1 = ¡ CHF 4,000; 2 = 4,000–5,999; 3 = 6,000–7,999; 4 = 8,000–9,999; 5 = 10,000.	[0;..;5]
Household size	Household size: 1 = single; 2 = 2–4 persons; 3 = >4 persons.	[0;..;3]
Labor force status	Labor force status: 1 = employed (full/part-time), 2 = unemployed, 3 = in education, 4 = retired, 5 = other.	[0;..;5]
Residential environment	Rural / Intermediate / Urban (official statistical classification).	[0;..;3]
Large labor market area	Seven NUTS2 statistical regions of Switzerland (Ticino and Lac Leman merged).	[0;..;8]

The table shows the definition and unit of all variables used in the SNB sample analysis. Variables of socioeconomic and behavioral control variables follow Brown et al. (2023).

Variable	Definition	Unit
Behavioral control variables		
High Education	Level of education: 1 = compulsory; 2 = upper secondary level; 3 = tertiary level. Dummy variable = 1 if tertiary education.	[0;1]
Financial literacy score	Number of correct answers to the "Big 3" financial literacy questions: interest rate literacy, inflation literacy, and portfolio diversification literacy.	[0;3]
Memory of numbers	Number of correctly recalled numbers (out of three) displayed at the beginning of the survey and chosen from a list of twelve numbers at the end.	[0;3]
Numeracy	Derived from a short numeracy test, including basic arithmetic and probability tasks.	number
Trust	Average of three items on trust in institutions (banks in Switzerland, main bank, Swiss Federal Council/judicial system), coded 1 = very low to 4 = very high.	[1;4]
Patience	Self-assessed willingness to delay gratification: scale from 0 = completely unwilling to 10 = very willing to give up something today to benefit in the future.	[0;10]
Present bias	Composite index of impulsivity and procrastination, each measured on a 0–10 scale. Higher values indicate stronger present bias.	[0;10]
Conscientiousness	Average of two items: (i) "I see myself as someone who does a thorough job," (ii) "Generally, I am someone others would describe as well organized." Scale from 1 = does not describe me at all to 7 = describes me perfectly.	[1;7]
Payment method characteristics		
Security	Perceived security of using payment instruments, Likert scale 1 (very bad) to 7 (very good).	[0;..;7]
Ease of use	Perceived ease of use, Likert scale 1–7.	[0;..;7]
Speed	Perceived transaction speed, Likert scale 1–7.	[0;..;7]
Costs	Perceived costs of using the instrument, Likert scale 1–7.	[0;..;7]
Budget control	Perceived help of instrument in keeping control of expenses, Likert scale 1–7.	[0;..;7]

The table shows the definition and unit of all variables used in the SNB sample analysis. Variables of socioeconomic and behavioral control variables follow Brown et al. (2023).

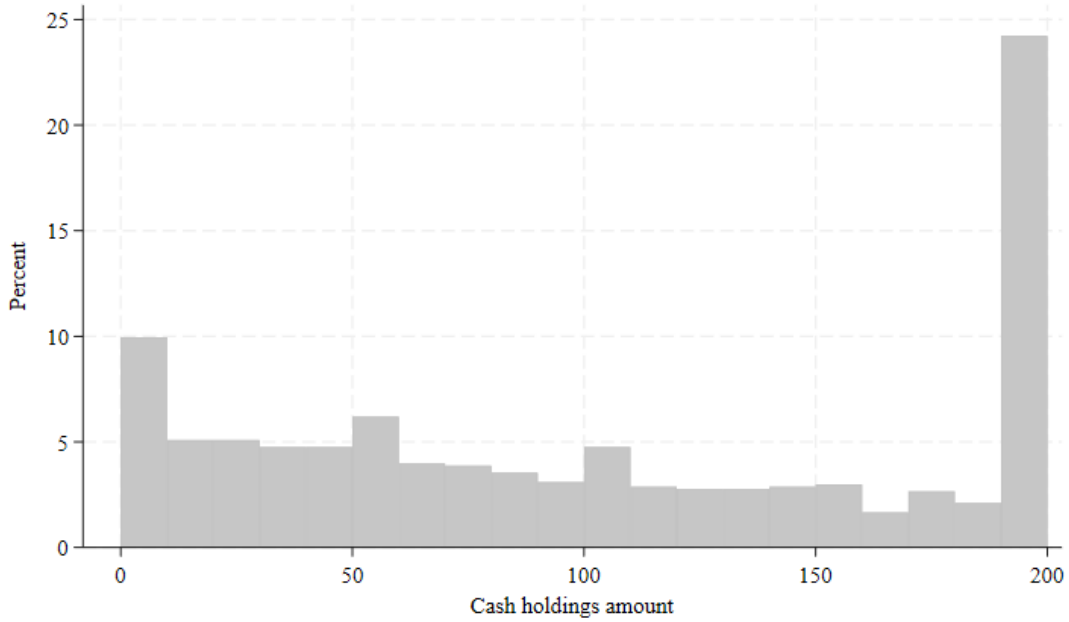
Table C2: Summary statistics SNB sample

Variable	Mean	Median	SD	Min	Max	N
Outcome variables						
Cash Holdings Amount	132.44	98.23	129.02	0.00	738.60	904
Cash Holdings	0.96	1.00	0.20	0.00	1.00	904
Alternative outcome variables						
Cash Holdings Amount – large-value	143.029	92.750	188.900	0.000	2505.000	1'134
Explanatory variables						
Risk aversion	11.98	12.00	6.73	1.00	32.00	904
Card acceptance	6.32	7.00	0.82	1.00	7.00	902
High Card Acceptance	0.50	1.00	0.50	0.00	1.00	904
Alternative explanatory variables						
Risk attitude – general	5.50	6.00	2.08	1.00	10.00	892
Socioeconomic control variables						
Age	50.18	52.00	17.28	16.00	96.00	904
Female	0.47	0.00	0.50	0.00	1.00	904
1 person household	0.19	0.00	0.39	0.00	1.00	904
2–4 person household	0.75	1.00	0.43	0.00	1.00	904
>4 person household	0.06	0.00	0.25	0.00	1.00	904
Employed	0.62	1.00	0.49	0.00	1.00	904
Family income	3.61	4.00	1.37	1.00	5.00	904
Rural	0.16	0.00	0.37	0.00	1.00	904
Distance ATM	0.95	0.80	0.61	0.28	6.11	904
Language region	0.62	1.00	0.49	0.00	1.00	904

Variable	Mean	Median	SD	Min	Max	N
Behavioral control variables						
High Education	0.60	1.00	0.49	0.00	1.00	904
Financial literacy	2.24	2.00	0.80	0.00	3.00	904
Memory of numbers	2.22	2.00	0.78	0.00	3.00	904
Numeracy	2.83	3.00	0.42	1.00	3.00	904
Trust	1.99	2.00	0.45	1.00	4.00	904
Patience	21.75	26.00	10.32	1.00	32.00	904
Present bias	4.18	4.00	1.96	0.00	9.50	904
Conscientiousness	5.43	6.00	1.40	1.00	7.00	904
Payment method characteristics						
High speed rating	0.53	1.00	0.50	0.00	1.00	904
High convenience rating	0.64	1.00	0.48	0.00	1.00	904
High cost rating	0.35	0.00	0.48	0.00	1.00	904
High payment records rating	0.39	0.00	0.49	0.00	1.00	904
High security rating	0.38	0.00	0.49	0.00	1.00	904

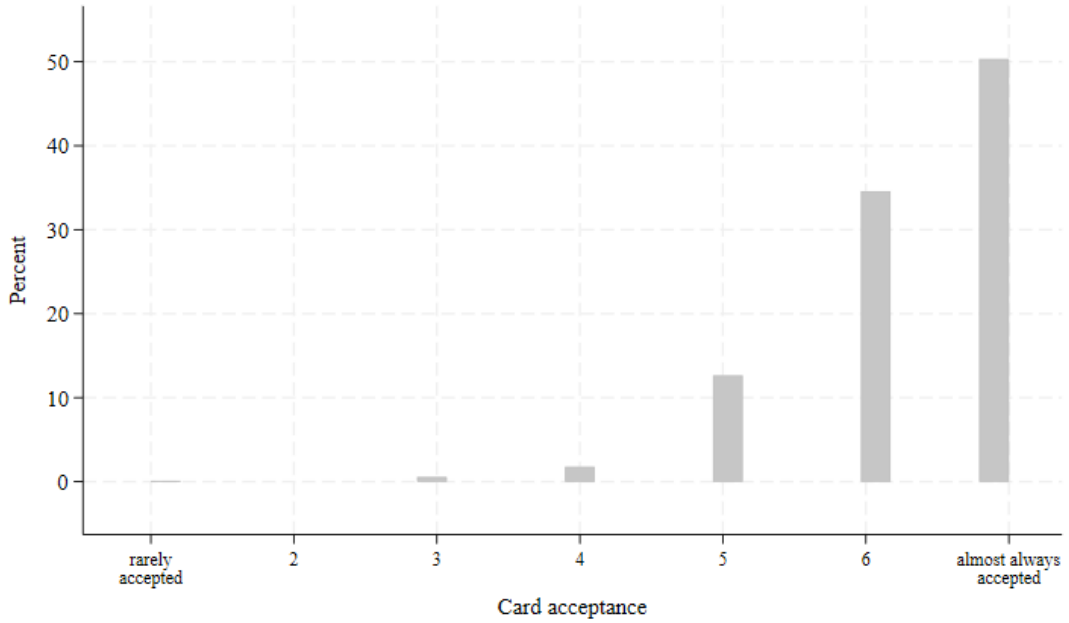
This table reports summary statistics for all variables used in the SNB sample analysis.

Figure C1: Distribution of cash holdings on-person in the SNB sample



This figure shows the average on-person cash holdings (excluding the top 1% of observations of very large-value holdings) in CHF 10 bins. Amounts larger than CHF 200 are summarized in one bin. The sample size is $N = 904$. Data source: Swiss National Bank's Payment Methods Survey of Private Individuals 2020.

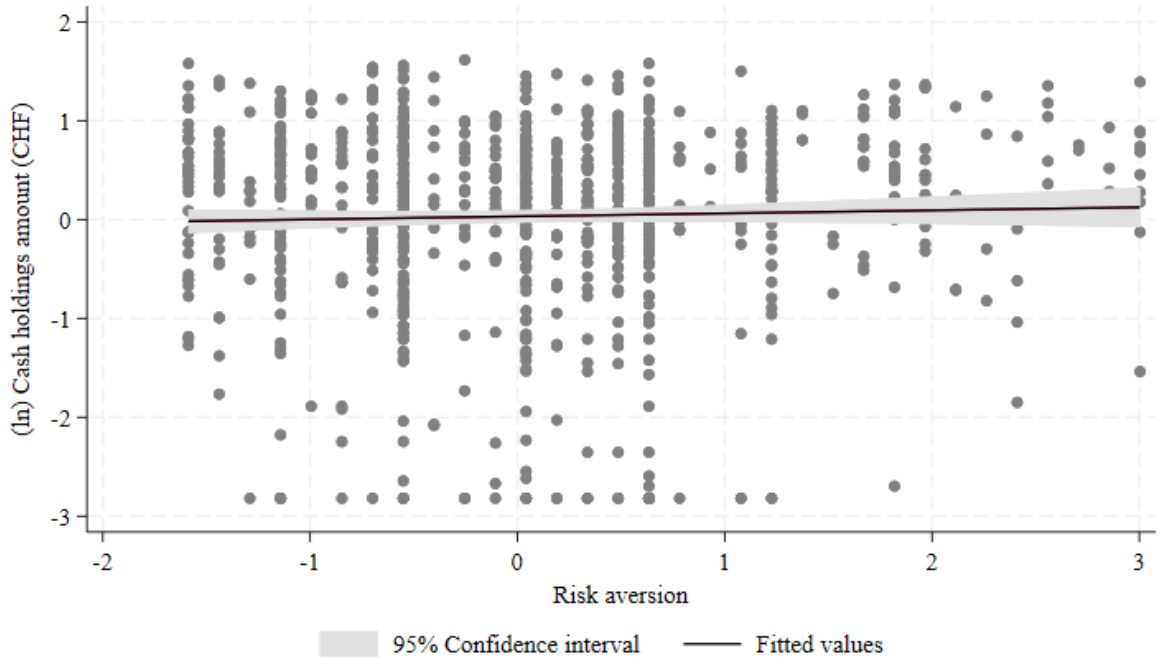
Figure C2: Beliefs about credit and debit card acceptance at the point of sale in the SNB sample



This figure shows the distribution of the answers to the question: "Please rate how likely credit/debit card is to be accepted for payment by stores, companies, online merchants, and other people or organizations." The 5-point Likert scale ranges from 1 = "rarely accepted" to 5 = "almost always accepted." The sample size is $N = 904$. Data source: Swiss National Bank's Payment Methods Survey of Private Individuals 2020.

C.2 Risk aversion and cash holdings – results

Figure C3: Risk aversion and cash holdings



This figure displays the association between the amount of cash holdings and risk aversion. All variables are standardized. The sample size is $N = 904$. Data source: Swiss National Bank's Payment Methods Survey of Private Individuals 2020.

Table C3: Risk aversion and cash holdings

	Full sample		**Card payers**	
	ln(*Cash Holdings Amount*)		ln(*Cash Holdings Amount*)	
	(1)	(2)	(3)	(4)
Risk Aversion	0.067	−0.091	0.136*	−0.101
	(0.046)	(0.077)	(0.069)	(0.111)
High Card Acceptance	0.120	0.109	0.194	0.168
	(0.104)	(0.103)	(0.144)	(0.142)
High Education	−0.159	−0.160	−0.176	−0.148
	(0.098)	(0.097)	(0.143)	(0.142)
Financial literacy	−0.052	−0.048	−0.103	−0.103
	(0.051)	(0.050)	(0.077)	(0.076)
Memory of numbers	0.127**	0.127**	0.119	0.119
	(0.051)	(0.051)	(0.074)	(0.073)
Numeracy	0.029	0.018	0.111	0.099
	(0.054)	(0.053)	(0.073)	(0.068)
Trust	−0.096*	−0.091*	−0.142*	−0.140*
	(0.054)	(0.054)	(0.073)	(0.073)
Patience	0.093	0.090	0.193**	0.196**
	(0.058)	(0.058)	(0.090)	(0.089)
Present bias	−0.185***	−0.181***	−0.218***	−0.209***
	(0.050)	(0.050)	(0.072)	(0.071)
Conscientiousness	−0.001	0.002	0.016	0.020
	(0.046)	(0.046)	(0.074)	(0.072)
Interaction terms	No	Yes	No	Yes
Socioeconomic control variables	Yes	Yes	Yes	Yes
Payment method characteristics	Yes	Yes	Yes	Yes
Labor market area controls	Yes	Yes	Yes	Yes
Observations	904	904	522	522
Mean of dependent variable	4.25	4.25	3.83	3.83
Adjusted R^2	0.217	0.224	0.193	0.205

This table reports OLS regression results for the full Swiss National Bank sample and for a subsample of people who indicated that they mostly pay by card. The dependent variable is ln(*Cash Holdings Amount*). Robust standard errors are reported in parentheses. All columns include socioeconomic controls for *female*, 5-year *age category dummies*, ln(*number of household members*), *employment status*, ln(*family income*), *residential environment*, *language region* and *distance to ATM*. All nonbinary independent variables are standardized. Data source: Swiss National Bank's Payment Methods Survey of Private Individuals 2020.

$^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

C.3 Robustness checks for the SNB sample

Table C4: Overview of robustness checks for the SNB sample

Dimension	Description and findings
Non-preregistered	
Outcome variable	Including large-value cash holdings leaves results unchanged.
Explanatory variables (risk preferences)	Using self-reported general risk attitudes yields similar null results.
Estimation methods	Tobit model (for bounded *Cash Holdings Amount*) and logit model (for binary *Cash Holdings*) both confirm main results.

The table summarizes preregistered and non-preregistered robustness checks for the SNB sample analysis.

Table C5: Risk aversion and cash holdings – robustness checks

	Outcome: *Cash Holdings Amount (large-value)*	**Explanatory:** Risk attitude – general	**Logit model:** *Cash Holdings*	**Tobit model:** *ln(Cash Holdings Amount)*
	(1)	(2)	(3)	(4)
Risk Aversion	−0.110		−0.333	−0.091
	(0.077)		(0.239)	(0.075)
Risk attitude – general		−0.115		
		(0.079)		
High Card Acceptance	0.137	0.104	0.740	0.109
	(0.104)	(0.105)	(0.487)	(0.101)
High Education	−0.204**	−0.164*	−0.256	−0.160*
	(0.099)	(0.098)	(0.456)	(0.095)
Financial literacy	−0.031	−0.052	−0.198	−0.048
	(0.051)	(0.052)	(0.209)	(0.049)
Memory of numbers	0.117**	0.115**	0.126	0.127**
	(0.051)	(0.051)	(0.219)	(0.049)
Numeracy	0.029	0.025	−0.096	0.018
	(0.053)	(0.054)	(0.247)	(0.051)
Trust	−0.088	−0.096*	−0.228	−0.091*
	(0.054)	(0.054)	(0.178)	(0.052)
Patience	0.056	0.096	0.094	0.090
	(0.059)	(0.059)	(0.242)	(0.056)
Present bias	−0.182***	−0.183***	−0.411*	−0.181***
	(0.050)	(0.051)	(0.248)	(0.048)
Conscientiousness	−0.004	0.007	−0.056	0.002
	(0.047)	(0.048)	(0.207)	(0.045)
Socioeconomic control variables	Yes	Yes	Yes	Yes
Payment method characteristics	Yes	Yes	Yes	Yes
Labor market area controls	Yes	Yes	Yes	Yes
Observations	914	892	728	904
Mean of dependent variable	4.23	4.25	0.96	4.25
Adjusted R^2	0.223	0.222		
AIC			338.49	3190.79
BIC			526.69	3411.90

This table reports robustness checks for the Swiss National Bank sample. Column (1) uses the alternative dependent variable ln(*Cash Holdings Amount–large value*); column (2) uses self-reported general risk attitude as the main explanatory variable; column (3) estimates a logit model for the binary *Cash Holdings* outcome; and column (4) estimates a Tobit model for ln(*Cash Holdings Amount*). Robust standard errors are reported in parentheses. All columns include socioeconomic controls for *female*, 5-year *age category dummies*, ln(*number of household members*), *employment status*, ln(*family income*), *residential environment*, *language region*, and *distance to ATM*. All nonbinary independent variables are standardized. Data source: Swiss National Bank's Payment Methods Survey of Private Individuals 2020.

*$p < .05$; **$p < .01$; ***$p < .001$.