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Do consumers pay more using debit cards than cash?

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This paper is dedicated to the memory of Emma Runnemark, good colleague and dear friend.

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ABSTRACT

We conduct an incentivized experiment to study the effect of the payment method on spending. We find that the willingness to pay is higher when subjects pay with debit cards compared to cash. The result is robust to controlling for cash-on-hand constraints, spending type, price familiarity and consumption habits of the products. The evidence thus suggests that different representations of money matters for consumer behavior. Such results further tease out the underlying mechanism of how payment methods influence spending behavior, which poses important implications for both consumers and merchants, as well as designing of digitalized payment in the future.

1. Introduction

Payments are deeply embedded in our daily life. Every day, we carry out various payments in different contexts and with different methods. For most of the 1900s, cash and checks were the most common means of exchange available for purchases and financial transactions between people and organizations (Evans and Schmalensee, 2005). During the second half of the 1900s, payment cards, such as credit and debit cards, were made available for store purchases and later used to withdraw cash from automatic teller machines (ATMs) (Slawsky and Zafar, 2005). In the 1990s, electronic commerce appeared as an alternative way of conducting financial transactions over the Internet, and Internet payments and Internet banks emerged (Zwass, 1996). Now the focus has shifted to the mobile phone and its capabilities of as a payment device. The prediction is that sooner or later, cash will die out and we will have a cashless society (Arvidsson and Markendahl, 2014; Carton and Hedman, 2013; Hedman, 2012).

Similar to payments practices that involve multiple industries (e.g., banking, retailing, and IT), payments research is a multi-disciplinary area that is tackled by scholars from Information Systems (IS). They are mostly interested in adoption and diffusion of digital payment technologies (Dahlberg et al., 2008, Holmström and Stalder, 2001, Jonker, 2007, Mallat, 2007, Ondrus and Pigneur, 2006, Plouffe et al., 2001, Schierz et al., 2010, Xin et al., 2015). Scholars from economics are mostly concerned with payment patterns at a macro-level (Garcia-Swartz et al., 2004, 2006, Humphrey, 2004, 2010, Prelec and Loewenstein, 1998). Others scholars from psychology strive to understand how payment context (e.g., recipients, pricing mechanism) affect paying behavior (Gneezy et al., 2010, Jung et al., 2014, Menon et al., 1997, Srivastava and Raghubir, 2002). Finally, others from consumer research and marketing are interested in how different payment methods influence consumer spending behavior (Chatterjee and Rose, 2012, Hirschman, 1979, Raghubir, 2006, Raghubir and Srivastava, 2002, 2009, Thomas et al., 2011).

This last stream of research on payment outcomes has attracted the most attention, and has generated fruitful results with important implications for designing new payment methods. This is associated with the widespread phenomenon of digitalization. The results of these studies have challenged the assumptions of standard economic theory that consumer valuations of products and services are independent of how money is represented, especially the payment instrument, supported by evidence that the payment instrument itself does affect spending (Feinberg, 1986, Hirschman, 1982, Prelec and Simester, 2001, Raghubir and Srivastava, 2008, Soman, 2001, 2003). However, it is worth noting that studies in this field have mainly been concerned with the comparison between credit cards and cash, showing that people tend to spend more with credit cards (Hafalir and Loewenstein, 2009, Humphrey, 2004, Prelec and Simester, 2001). Considering

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the fact that credit cards and cash differ on two fundamental aspects (the coupling between consumption and payment, and the format), it is reasonable to conclude that such impacts can be attributed to: (1) the temporal separation between consumption and payment (Prelec and Loewenstein, 1998); (2) the representation of money itself (Feinberg, 1986, Raghubir and Srivastava, 2008); or (3) a combination of both.

One way to tease out the underlying mechanism of why certain payment methods induce more spending (or willingness to spend more) is to find a substitute payment method for cash that only differs in terms of the format or representation. Other studies in this endeavor focus on gift certificates, prepaid cards, and different denominations of cash (Mishra et al., 2006, Raghubir and Srivastava, 2008, Raghubir and Srivastava, 2009, Soman, 2001, 2003, Vandoros, 2013) but apart from cash denominations, these payment methods are often restricted to certain purchases so they may not be treated as substitutes for cash (see Felső and Soetevent, 2014).

This research serves as an effort to further clarify the underlying mechanism of the relationship between payment methods and spending behavior by investigating whether consumers pay more for identical products using debit cards compared to cash. There are three reasons for comparing cash and debit cards. First, debit cards are attractive to study since debit card transactions, just as cash, are ubiquitous and immediate, making debit cards a suitable substitute for cash. In other words, debits cards do not differ from cash in terms of the underlying payment mechanism (e.g., tight coupling between consumption and payment), but only in the representation of money (digital and invisible versus physical). In this sense, comparing debit cards with cash will allow us examine whether the payment format itself influences spending behavior. This is indeed an under-explored research area.

Second, debit cards have become increasingly popular (Borzekowski et al., 2008). For instance, debit card transactions account for a larger share of payments in the U.S. than credit cards (CPSS, 2013). In Denmark, where we conducted our experiment, debit cards are the most common payment method both in terms of transaction value and diffusion rate (87% of the population between 15 and 79 years old has the national debit card Dankort) (Nationalbanken, 2014). Third, debit cards are increasingly being embedded on mobile phones and thus the affect of debit cards on spending is critical for mobile payment research.

Our experiment is among the first endeavors to compare debit card spending with cash. Indirect evidence can be traced to charitable giving, where Soetevent (2011), using a field experiment, found that debit cards lead to higher donations than cash, conditional on choosing to donate money. However, just as in the incentivized experiments on credit cards, there is the possibility that the result is, at least partly, driven by cash-on-hand constraints. To tease out the influence of the payment form, our experimental design controls for this as well as order effects, spending type, price familiarity and consumption habits of the products.

We find that the willingness-to-pay is higher for debit cards than cash. The effect is sizeable, average bids increase by 22–54% when paying with a debit card. This result suggests that the format of money affects the willingness to pay. Cash payments, which are more transparent than debit card transactions, make it easier to control spending, and this effect is not solely due to cash-on-hand constraints. This may explain why some people prefer cash in order to control their spending. The implication for consumers, with the ongoing digitization of payments, is that they lose some control over their spending and face the risk of overspending. For merchants, on the other hand the recommendation is to encourage debit card payment.

This article is organized as follows. The next section reviews the related literature on debit cards and cash spending. Section 3 outlines the experimental design, procedure and expected outcomes. In Section 4, we present the results. This is followed by a discussion in Section 5. Finally, we conclude the paper in Section 6.

2. Payment method and spending

Studies focusing on how different payment methods induce different spending behavior of the consumers have been one of the main streams of payment related research for in particular marketing and consumer research. Credit cards are among the most studied payment methods (Carow and Staten, 1999, Feinberg, 1986, Hafalir and Loewenstein, 2009, Humphrey, 2004, Thomas et al., 2011. Worthington et al., 2007, Zinman, 2009) and used to be compared with cash. One of the earliest efforts was carried out by Prelec and Simester (2001) who conducted two incentivized experiments comparing credit cards with cash by selling sports tickets and a dinner certificate. They found a difference between those who were instructed to pay with their credit cards and those who were instructed to pay with cash for the sports tickets but not for the dinner certificate.

While there were other differences between the two studies, an important difference was that the sports tickets are of an uncertain price and the dinner certificate stated how much it was worth at the restaurant. They also varied exposure to credit cards among cash payers for the dinner certificate but did not replicate the logo effect. Thus, their results suggested that the payment method itself mattered and that uncertainty regarding the price of the product may have influenced the outcome.

Meanwhile, studies conducted in other controlled environment utilizing experiments have been able to confirm the effects of the subjectivity associated with payment methods, in particular the forms. They found that the presence of a credit card logo only can induce higher willingness of paying (Feinberg, 1986, Raghubir and Srivastava, 2008). In another vein, Chatterjee and Rose (2012) found that credit cards seem to prime consumers to think about benefits of products while cash activate costs considerations. They suggested that since credit cards separate payment (and thus the pain of paying) from consumption, repeated use of credit cards reinforces the positive feelings of purchases while the immediate pain felt with cash reinforces cost considerations.

Furthermore, studies based on natural settings also present a similar pattern regarding spending behavior associated with different payment methods. For instance, research based on grocery data has reported that credit cards are associated with higher spending than cash. This is true especially regarding certain types of products, such as flexible items (treats and luxuries) (Soman, 2003), and unhealthy foods (Thomas et al., 2011), suggesting cash constraining impulsive buying. Similarly, Hafalir and Loewenstein (2009) ran a field experiment comparing cash and credit card spending at lunch time at a major insurance company. They found that only credit card users who were not carrying any credit card debt (convenience users) spent more than cash users, suggesting an effect from past credit card expenses.

The concept of "pain of paying," advanced by Prelec and Loewenstein (1998), has been argued as the theoretical explanation for why spending may be higher with different payment instruments than with cash. The pain of paying idea suggests that, when paying for consumption, consumers experience an immediate pain when parting with money. The less transparent the payment is (the less the payer feels the outflow of money), the less painful it is to pay. Soman (2003) defines the transparency of a payment method as the salience of parting with money. The level of transparency can be affected by the form that the payment comes in and the temporal separation of consumption and