



The Anesthesia of Digital Transactions: A Conceptual Framework Linking the Pain of Paying to Expense Control and Debt Accumulation

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ABSTRACT

The rapid digitalization of financial services has fundamentally altered how economic agents interact with money, shifting the paradigm from tangible cash exchanges to frictionless digital transactions. Grounded in behavioral economics and mental accounting theory, this conceptual paper investigates the psychological phenomenon known as the “pain of paying” and its profound impact on financial behavior. Specifically, this article proposes a comprehensive theoretical framework illustrating how the pain of paying influences expense control and debt accumulation. Furthermore, it introduces digital finance adoption, including e-wallets, mobile banking, and “Buy Now, Pay Later” (BNPL) schemes, as a critical moderator that numbs this psychological pain. We argue that while financial technology enhances transactional efficiency, it inadvertently weakens self-regulatory mechanisms, leading to suboptimal cash management and an increased propensity for over-indebtedness. The conceptual framework extends to the context of individual consumers as well as Micro, Small, and Medium Enterprises (MSMEs), highlighting the necessity for robust financial literacy and an entrepreneurial mindset to buffer these adverse effects. The paper concludes with theoretical and practical implications, suggesting avenues for future empirical validation, particularly utilizing variance-based structural equation modeling techniques, and offering insights for regulatory frameworks governing digital financial services.

Keywords: Behavioral Economics; Debt Accumulation; Digital Finance; Mental Accounting; Pain of Paying

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INTRODUCTION

The evolution of money from physical currency to digital notations represents one of the most significant behavioral shifts in modern economic history (Chuen & Zhao, 2024). Historically, the act of consumption was inextricably linked to the physical relinquishment of cash, a process inherently fraught with psychological friction (Dant, 2000). This friction, known as the “pain of paying,” serves as a natural self-regulatory mechanism that curbs impulsive spending and promotes prudent financial management (Reshadi & Fitzgerald, 2023; Shah, 2015; Zellermayer, 1996). However, the advent of financial technology (FinTech) and the pervasive adoption of digital finance have systematically dismantled this friction (Ghosh & Golder, 2026) .

Today’s financial ecosystem is characterized by contactless payments, embedded finance, and deferred payment schemes such as “Buy Now, Pay Later” (BNPL) (Donou-Adonsou & Leslie-Piper, 2025). While these innovations drive unprecedented financial inclusion and transactional efficiency, they introduce latent behavioral risks. By decoupling the consumption experience from the immediate psychological cost of payment, digital finance acts as a cognitive anesthetic (Kinanti et al., 2026; Patil, 2026). Consequently, economic agents, ranging from individual households to Micro, Small, and Medium Enterprises (MSMEs), find themselves navigating a complex environment where traditional cues for expense control are increasingly muted (Widita et al., 2024).

Despite the growing body of literature on digital finance adoption, there remains a theoretical gap in understanding how the attenuation of the pain of paying cascades into long-term financial health indicators, specifically expense control and debt accumulation. Most existing studies isolate the pain of paying within the narrow context of immediate purchase intentions or willingness to pay, neglecting its broader systemic implications for continuous cash management and capital resilience.

This conceptual paper aims to bridge this gap by proposing an integrated theoretical framework. We pose the following guiding questions: How does the psychological pain of paying serve as a determinant of rigorous expense control and a deterrent to debt accumulation? Furthermore, how does the adoption of digital finance moderate these relationships? By unpacking these dynamics, this article contributes to the intersection of behavioral economics, corporate financial management, and digital finance literature.

THEORETICAL

Mental Accounting and Behavioral Economics

The foundation of our conceptual model rests upon Mental Accounting theory, that refers to the cognitive processes whereby individuals and businesses code, categorize, and evaluate economic outcomes (Prelec & Loewenstein, 1998; Silva et al., 2023; Skwara, 2023; Xie, 2019). According to traditional economic theory, money is fungible; a dollar in one account holds the exact same value as a dollar in another (Ige, 2026). However, behavioral economics demonstrates that economic agents violate the principle of fungibility by creating distinct mental compartments for different sources of income and types of expenditures (Hasan et al., 2025; Sadhu, 2025) .

Within this framework, the timing and format of a transaction critically influence how an expenditure is mentally recorded. When transactions are transparent and immediate, the mental account is simultaneously debited, triggering immediate cognitive processing of the financial loss (Silva et al., 2023).

Conversely, opaque or deferred payment mechanisms obfuscate this mental bookkeeping. This cognitive categorization is not merely a theoretical abstraction; it directly dictates the strictness with which budgets are monitored and the threshold at which spending is curtailed (Schreiber et al., 2024) .

The Psychology of the Pain of Paying

The “pain of paying” is defined as the negative affect or psychological distress experienced when parting with money (Zellermayer, 1996). It is an emotional response rather than a purely rational calculation of opportunity cost. The intensity of this pain is largely determined by two factors: salience (how noticeable the outflow of money is) and timing (the temporal distance between the payment and the consumption) (Lee et al., 2020) .

Cash transactions exhibit maximum salience (Huebner et al., 2020). The physical act of handing over bills forces a tangible realization of wealth depletion. In contrast, credit cards and e-wallets possess low salience; a simple swipe or biometric scan completes the transaction without any visual reduction in physical assets (Huebner et al., 2020). Furthermore, deferred payments separate the joy of consumption from the pain of payment (Kumari & Tripathi, 2026). When consumption precedes payment, the eventual payment feels like an uncompensated loss (Reshadi & Fitzgerald, 2023). However, at the exact moment of decision-making, the absence of immediate payment artificially inflates the perceived net utility of the purchase, overriding self-control mechanisms (Liu, 2023).

Financial Technology and Payment Salience

Financial Technology (FinTech) has fundamentally redesigned the architecture of choice in consumer and business transactions (Urikova et al., 2025). Digital platforms are meticulously engineered to minimize friction (Fu et al., 2027). One-click checkouts, auto-renewing subscriptions, and invisible background payments (e.g., ride-sharing apps) represent the zenith of this frictionless environment.

From a behavioral standpoint, these innovations do not eliminate the financial cost; they eliminate the psychological signaling of the cost. In the context of business operations, particularly for small enterprises, the digitization of supply chain payments and automated procurement can similarly reduce the cognitive scrutiny typically applied to physical cash disbursements, potentially leading to relaxed cost behavior and overhead creep (Bigliardi et al., 2022) .

Expense Control and Cash Management

Expense control is an essential dimension of financial management, encompassing the deliberate tracking, regulation, and minimization of outflows to maintain liquidity and achieve financial goals (Tsyganov, 2022). In traditional corporate financial management, strict expense control directly influences metrics such as the break-even point and operating margins (Choudhary & Singh, 2025). For individuals and MSMEs, it dictates cash flow survival (Nkwinika & Akinola, 2023).

Behaviorally, expense control is an exercise in self-regulation. It requires continuous cognitive effort to weigh immediate gratification against long-term financial stability (O’Donoghue & Rabin, 2000). Effective cash management relies heavily on feedback loops (Gesah et al., 2024). When feedback (in the form of depleted cash reserves) is immediate and salient, agents adapt their behavior swiftly, tightening their budgets (Jung et al., 2020). When feedback is delayed or obscured by credit lines, the self-regulatory

loop is broken, leading to passive overspending (Elena Francke & Carrete, 2023).

METHODS OF RESEARCH

Integrating the aforementioned theories, we propose a conceptual model (Abbas et al., 2025; Li et al., 2023; Oliveira, 2022; Razak et al., 2015; Riglietti, 2022; Shan Loh & Van Thai, 2014) illustrating the direct effects of the pain of paying on expense control and debt accumulation, alongside the moderating effects of digital finance adoption and financial literacy/mindset.

RESULT AND DISCUSSION

Result

The pain of paying serves as an automatic psychological brake. When an individual or a business owner feels a pronounced psychological cost associated with a transaction, they are forced to evaluate the utility of that transaction more rigorously (Muehlbacher et al., 2011). High pain of paying induces a state of heightened financial awareness (Robitaille et al., 2026) . For an enterprise, this translates into rigorous cost-benefit analyses, better adherence to financial forecasting, and a stronger grasp on cost behavior. For consumers, it results in strict adherence to mental budgets. Conversely, when the pain of paying is low, the cognitive threshold for authorizing an expenditure drops. This leads to relaxed expense control, characterized by subscription fatigue, failure to renegotiate recurring costs, and susceptibility to impulse purchases.

Proposition 1: The intensity of the pain of paying is positively associated with the rigor of expense control and effective cash management practices.

Debt accumulation is fundamentally a consequence of expenditures outpacing liquid assets (Agarwal et al., 2026). The pain of paying interacts with debt primarily through its deterrence effect (Achtziger, 2022). If parting with money is painful, acquiring liabilities that mandate future parting of money (with interest) should theoretically be even more aversive. Therefore, a highly sensitive pain of paying acts as a psychological safeguard against the accumulation of discretionary debt (Reshadi & Fitzgerald, 2023). When the pain of paying is suppressed, economic agents exhibit higher discount rates, heavily favoring current consumption. The psychological separation of the present benefit from the future cost reduces the perceived severity of taking on debt (Schanbacher et al., 2021) .

Proposition 2: The intensity of the pain of paying is negatively associated with the rate and volume of debt accumulation.

The adoption of digital finance acts as the primary catalyst in modern economies that manipulates the pain of paying. Digital payment modalities are inherently designed to be frictionless. As economic agents integrate deeper into digital finance ecosystems (e.g., relying exclusively on QR codes, contactless cards, and auto-debits), the traditional cues that trigger the pain of paying are systematically dismantled. Therefore, we posit that digital finance adoption acts as a negative moderator. The inherent positive relationship between the pain of paying and expense control is weakened in highly digitized environments. Even individuals who naturally possess a high aversion to spending may find their self-regulation undermined by the seamless nature of digital checkouts. Similarly, the psychological barrier to debt is

eroded when credit is presented as a frictionless digital option.

Proposition 3a: Digital finance adoption negatively moderates the relationship between the pain of paying and expense control; higher adoption weakens the positive effect of the pain of paying on expense control.

Proposition 3b: Digital finance adoption negatively moderates the relationship between the pain of paying and debt accumulation; higher adoption weakens the protective (negative) effect of the pain of paying against debt accumulation.

Discussion

This conceptual paper advances behavioral economics and mental accounting literature by transitioning the “pain of paying” from a transactional construct to a systemic one. While previous literature has extensively documented how payment methods alter immediate willingness to pay, our framework demonstrates how these micro-level behavioral shifts aggregate into macro-level financial outcomes: long-term expense control and structural debt accumulation.

Furthermore, this paper integrates the digital finance literature with psychological constructs. By positioning FinTech not merely as a technological tool but as a psychological moderator, we provide a more nuanced understanding of technology adoption. It challenges the purely rational view of technology adoption models, suggesting that the “ease of use” (a traditionally positive construct) may possess a dark side when applied to financial transactions, actively eroding financial self-discipline.

The implications of this framework are highly relevant for multiple stakeholders. For Micro, Small, and Medium Enterprises (MSMEs), understanding the pain of paying is dual-faceted. On the operational side, MSME owners must guard against the erosion of their own expense control as business-to-business (B2B) payments become digitized, ensuring that concepts like Total Cost of Ownership (TCO) and return on investment remain central to procurement decisions. On the revenue side, MSMEs can strategically design their pricing models to reduce the pain of paying for their customers, thereby increasing sales resilience.

From a regulatory perspective, this framework highlights the necessity for proactive consumer protection. Regulators, such as the Financial Services Authority (Otoritas Jasa Keuangan/OJK), must recognize that frictionless credit (like BNPL) bypasses natural psychological defenses. Regulatory sandboxes evaluating new FinTech products should not only assess systemic financial risk but also behavioral risk. Mandating “positive friction”, such as enforced cooling-off periods for digital credit approvals or explicit visualizations of accumulated debt post-transaction, could artificially reintroduce the pain of paying to protect vulnerable consumers.

CONCLUSION

The digitalization of money is an irreversible trajectory that brings undeniable economic efficiency and inclusion. However, this conceptual paper argues that this transition silently dismantles a critical behavioral safeguard: the pain of paying. By decoupling financial transactions from psychological friction, digital finance creates an environment highly susceptible to weakened expense control and accelerated debt accumulation. Recognizing this dynamic is paramount. To navigate this new era successfully, individuals, businesses, and regulators must move beyond traditional financial management paradigms and actively

address the behavioral and psychological architectures that drive modern economic decision-making.

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