Regulation on the Margin: Evidence from Online Payday Lending

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Payday loans continue to be a commonly used yet controversial source of credit for low-income consumers. Regulation of this market must balance the beneficial uses of payday lending with harmful, inefficient uses that exacerbate financial hardship. The best way to strike this balance, we argue, is to regulate at the margin—that is, experiment with different types of regulation at the extensive margin and the stringency of those regulations at the intensive margin.

After highlighting common payday loan regulations and the conflicting evidence of their consequences, speaking primarily to regulation at the extensive margin, we present an empirical analysis utilizing proprietary data from a payday lender operating in Tennessee to demonstrate the effects of loan caps in a novel setting and highlight the benefits of regulation at the intensive margin. Specifically, we study the consequences of capping online payday loan size using a fuzzy regression kink design, exploiting exogenous variation in loan size generated by the interaction of the lender's underwriting rules with a state loan-size cap. We exploit this variation to estimate the effect of capping loan sizes on total subsequent indebtedness from any type of subprime credit, late payment, and default. The analysis both improves our collective understanding of loan caps' effects and shines light on an increasingly important, yet understudied, setting for subprime lending: online.

Our results show that online payday loan borrowers are severely credit constrained and that restricting payday loan size increases subsequent indebtedness. These findings coupled with related but contradictory findings in settings where loan caps are higher suggest marginal tweaks to the state loan cap may benefit borrowers, demonstrating a real-life policy setting ripe for regulation at the margin.

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Introduction

Student loans are welfare enhancing generally, but not always. Credit cards come with great benefits, but they can have their downsides too. Payday loans, though only one part of the "fringe" economy, are no different.[1] Whether a reader considers these analogies false equivalencies or not largely depends on her assessment of the relative benefits and costs of each of these forms of credit. Sure, student loans from attending a defunct, for-profit college are bad, but most student loans enable reasonable investments in human capital that pay for themselves in due time. By contrast, payday loans are so frequently detrimental to the financial health of borrowers that society would be better off if they simply did not exist. Right? Well, that depends on the benefits payday loans produce in relation to their costs. But do the benefits outweigh the costs? Scholarship to date can offer two potential answers that are simple, yet unsatisfying: "(1) it depends, and (2) the jury's still out."[2]

Neoclassical economic theory views credit as a useful tool for smoothing consumption over time.[3] The logic is intuitive. Since there is diminishing marginal utility to consumption, an economic actor can improve her welfare through increased consumption today by borrowing against future consumption when income is presumptively higher.[4] This function of credit

1. *See* LISA SERVON, THE UNBANKING OF AMERICA: HOW THE NEW MIDDLE CLASS SURVIVES 73-75, 79 (2017) (recounting one women's utilization of payday lending and struggling to classify the loans as "good" or "bad" debt).

2. *Id.* at 80. A significant literature exists attempting to offer clearer answers to this question. Often using changes in payday lending laws or individual-level administrative data, this literature examines the effects of having access to or receiving a storefront payday loan on measures of financial health. Nonetheless, no consensus on the net welfare consequences of these small-dollar, short-term, high-interest loans has emerged from these studies. *See, e.g.*, Neil Bhutta, *Payday Loans and Consumer Financial Health*, 47 J. BANKING & FIN. 230 (2014); Neil Bhutta, Paige Marta Skiba & Jeremy Tobacman, *Payday Loan Choices and Consequences*, 47 J. MONEY, CREDIT & BANKING 223 (2015); Scott Carrell & Jonathan Zinman, *In Harm's Way? Payday Loan Access and Military Personnel Performance*, 27 REV. FIN. STUD. 2805 (2014); Susan Payne Carter, *Payday Loan and Pawnshop Usage: The Impact of Allowing Payday Loan Rollovers*, 49 J. CONSUMER AFFS. 436 (2015); Brian T. Melzer, *The Real Costs of Credit Access: Evidence from the Payday Lending Market*, 126 Q.J. ECON. 517 (2011); Donald P. Morgan, Michael R. Strain & Ihab Seblani, *How Payday Credit Access Affects Overdrafts and Other Outcomes*, 44 J. MONEY, CREDIT & BANKING 519 (2012); Adair Morse, *Payday Lenders: Heroes or Villains?*, 102 J. FIN. ECON. 28 (2011); Paige Marta Skiba, *Tax Rebates and the Cycle of Payday Borrowing*, 16 AM. L. & ECON. REV. 550 (2014); Paige Marta Skiba & Jeremy Tobacman, *Do Payday Loans Cause Bankruptcy?*, 62 J.L. & ECON. 485 (2019); Jonathan Zinman, *Restricting Consumer Credit Access: Household Survey Evidence on Effects Around the Oregon Rate Cap*, 34 J. BANKING & FIN. 546 (2010).

3. *E.g.*, Carlie Malone & Paige Marta Skiba, *Regulation and Recent Trends in High-Interest Credit Markets*, 16 ANN. REV. L. & SOC. SCI. 311, 314 (2020) ("[F]rom an economist's perspective, credit facilitates a consumption-smoothing process—individuals borrow to meet expenses today based on expected future earnings. This process is seen as unequivocally beneficial from an economist's view . . . .").

4. Giuseppe Bertola, Richard Disney & Charles Grant, *The Economics of Consumer Credit Demand and Supply*, in THE ECONOMICS OF CONSUMER CREDIT 4-6 (Giuseppe Bertola, Richard Disney & Charles Grant eds., 2006) (developing a model of consumer behavior,

is generally viewed positively, even if that was not always the case.[5] Consumers use credit to buy high-cost goods and services before paying them off during their useful lives or to weather temporary economic setbacks. For example, credit enables the purchase of durable consumer goods; access to education; investment in income-generating physical capital; and absorption of income shocks from accidents, emergencies, or other stimuli. Beyond the individualized benefits that credit provides, credit also helps sustain the markets for durable goods, human-capital formation, and physical capital, while enabling a productive use of capital for net savers in the economy.[6]

Despite the negative air surrounding payday loans, they too can help deliver these individualized and societal benefits.[7] Many underestimate these theoretical benefits because, on their face, payday loans appear usurious, predatory, and like a downright bad financial decision.[8] But even an arguably usurious loan can deliver individualized benefits if the marginal benefit from the loan exceeds the present value of the future interest payments on the loan. In other words, it would be wrong to characterize payday loans as per se harmful.[9]

Nonetheless, real people do not always behave as neoclassical theory might predict.[10] Not all borrowers use credit for beneficial consumption-

concluding that "[l]ending and borrowing make it possible to redistribute spending from periods in the life cycle in which income is high to periods in which it is low").

5. *See id.* at 3 (discussing the historical evolution of the public's perception of borrowing from "foolhardy behavior or evidence of moral desuetude" to "perfectly normal nowadays"); THOMAS A. DURKIN, GREGORY ELLIEHAUSEN, MICHAEL E. STATEN & TODD J. ZYWICKI, CONSUMER CREDIT AND THE AMERICAN ECONOMY 6 (2014) ("Today, regardless of any concerns over growth trends, most informed observers agree that consumer credit availability in the modern economy provides a number of important economic benefits."). *But cf.* Abbye Atkinson, *Rethinking Credit as Social Provision*, 71 STAN. L. REV. 1093 (2019) (questioning the modern urge to substitute a robust social safety net with sufficient access to credit).

6. DURKIN ET AL., *supra* note 5, at 6-9.

7. *See, e.g.*, Christine L. Dobridge, *High-Cost Credit and Consumption Smoothing*, 50 J. MONEY, CREDIT & BANKING 407, 408 (2018) (identifying consumption-smoothing benefits from access to payday lending among households experiencing financial shocks precipitated by exogenous, extreme-weather events). *But cf.* Sean Hundtofte, Arna Olafsson & Michaela Pagel, *Credit Smoothing* (Nat'l Bureau of Econ. Rsch., Working Paper No. 26354, 2019), https://www.nber.org/system/files/working_papers/w26354/w26354.pdf [https://perma.cc/Z7MM-JVY4] (finding no increase in checking account overdrafts or credit card debt in response to transitory unemployment shocks).

8. *See The Debt Trap of Triple-Digit Interest Rate Loans: Payday, Car-Title, and High-Cost Installment Loans*, CTR. FOR RESPONSIBLE LENDING (2019), https://www.responsiblelending.org/sites/default/files/nodes/files/research-publication/crl-finfairness-payday-mar2019.pdf [https://perma.cc/H6H2-TV97]; SERVON, *supra* note 1, at 90-91 ("The consumer advocates don't understand the kind of pressures low-income people are under, the instability they face.").

9. Paige Marta Skiba, *Regulation of Payday Loans: Misguided?*, 69 WASH. & LEE L. REV. 1023, 1027-28 (2012); Malone & Skiba, *supra* note 3, at 314.

10. *See* Morgan et al., *supra* note 2 ("Textbook theory predicts households should be weakly better off from having access to another type of credit, but of course, textbook models assume symmetric information between lenders and borrowers and perfectly rational, time-consistent borrowers."); *see also* Richard C. Wilson & Robert C. Kelly, *Homo Economicus: Meaning, Overview, and Criticisms*, INVESTOPEDIA (Aug. 20, 2023), https://www.investopedia.com/ask/answers/08/homo-economicus.asp [https://perma.cc/D6PB-4B26] ("Homo economicus is wrong

smoothing purposes or to purchase consumer durables. In fact, many probably do not—at least among payday loan users.[11] Although a payday loan borrower may be no more likely to make economic mistakes when taking out these loans than other borrowers, the consequences of the payday loan borrower's mistakes may be much more severe given her precarious financial position.[12] Taking out a payday loan at all suggests some level of financial distress since cheaper, more conventional forms of credit are likely (though not always) unavailable.[13] The demographic makeup of those using payday loans further evinces the point; on average, payday loan borrowers are less educated, lower-income, less likely to own a home, and more likely to have a child in the home than non-payday loan borrowers.[14]

The heightened stakes for borrowers in the payday loan market, and the fringe economy more broadly, certainly motivates meaningful government regulation.[15] At the same time, the high demand for credit among low-income payday loan borrowers coupled with the lack of substitutes available to this population heightens the stakes for regulators. Without payday loans, many of these individuals would be left with no other access to credit.[16] It is not as simple as taking out a lower-cost personal loan or borrowing from a family member,[17] as some suggest.[18]

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because it assumes that humans make rational decisions when, in fact, humans are flawed beings that make irrational decisions, sometimes against their own interests.").

11. *See* Nick Bourke, Alex Horowitz & Tara Roche, *Payday Lending in America: Who Borrows, Where They Borrow, and Why*, PEW CHARITABLE TRUSTS 13 (2012), https://www.pewtrusts.org/-/media/legacy/uploadedfiles/pcs_assets/2012/pewpaydaylendingreportpdf.pdf [https://perma.cc/D5JB-N3Q7] ("Four times more storefront borrowers used their first payday loans for a recurring expense (69 percent) than for an unexpected expense (16 percent)."); Skiba, *supra* note 9, at 1028 (describing suboptimal uses of payday loans).

12. *See* Nathalie Martin & Ernesto Longa, *High-Interest Loans and Class: Do Payday and Title Loans Really Serve the Middle Class?*, 24 LOY. CONSUMER L. REV. 524, 561 (2012) ("Given that [the working poor served by the payday loan industry] have more to lose through high-cost credit than a more middle class clientele would, more effective regulation is warranted.").

13. *See* Bhutta et al., *supra* note 2, at 233 (concluding that "[a]t the time of their first applications, prospective payday borrowers appear to be having major financial difficulties" and noting that "over 78% of payday applicants (including those without a card) have zero credit available on credit cards and another 4% have less than $50 available" and "[n]inety percent have no more than $300"). Although cheaper credit may be available, it appears to be quite limited, *id.*, and even where credit is available, borrowers may turn to payday lending to safeguard what little credit they have available through more traditional channels, which may have more detrimental consequences for nonpayment. SERVON, *supra* note 1, at 80. But the financial signal that taking out a payday loan conveys by itself may still produce negative repercussions, even if the loan is used effectively and repaid in full. *Id.* at 91.

14. Martin & Longa, *supra* note 12, at 541-49, 557-59 (surveying demographics reported in earlier payday loan studies and producing new demographic results using bankruptcy data); *see* Scott Fulford & Cortnie Shupe, *Consumer Use of Payday, Auto Title, and Pawn Loans: Insights from the Making Ends Meet Survey* 9 (Consumer Fin. Prot. Bureau Off. of Rsch, Rsch. Brief No. 2021-1, 2021) (reporting statistics for alternative financial service users, including payday loan, auto title loan, and pawnshop loan borrowers).

15. *See* Martin & Longa, *supra* note 12, at 561.

16. *See* Bhutta et al., *supra* note 2, at 233; SERVON, *supra* note 1, at 76-77.

17. *See* Bhutta et al., *supra* note 2, at 234 ("[F]irst-time payday applicants appear to be searching intensively, but unsuccessfully, for traditional (and presumably cheaper) credit.").

18. SERVON, *supra* note 1, at 76.

Regulators face a significant challenge in this regard because it may be difficult to distinguish an inefficient (or irrational) borrower from an efficient (or rational) one. Consequentially, regulators must be careful about crafting policies to protect the former without unduly harming the latter. When faced with two borrowers—one who (efficiently) uses a payday loan to repair her car after it unexpectedly breaks down and another who (inefficiently) uses a payday loan to satiate short-term consumption before repeatedly rolling the loan over—"[p]olicy designed to protect the first individual may harm the second."[19] Given the potential negative spillover effects of wholesale destruction of the payday loan market on borrowers using these loans efficiently—whether through outright bans or other limitations that operate as de facto bans—policymakers ought to take a marginal approach to regulation, curbing undesirable borrowing behavior while preserving access for those using payday loans beneficially.[20]

With this principle in mind, policymakers still have a variety of tools at their disposal for regulating the payday loan market. On this front, states have truly taken up Justice Brandeis's invitation to act as laboratories of democracy,[21] in many cases demonstrating willingness to regulate at the extensive margin by enacting new types of regulation altogether. States have implemented outright bans, interest rate caps (sometimes acting as de facto bans), information disclosure requirements, mandatory minimum loan lengths, and rollover limits, among other regulations.[22] Bolstering this intricate web of state-level regulation, federal law establishes regulatory floors along some of these regulatory dimensions.[23]

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19. Jacob Hale Russell, *Misbehavioral Law and Economics*, 51 U. MICH. J.L. REFORM 549, 550 (2018); *see* SERVON, *supra* note 1, at 82-83 (describing the difficulty of crafting policy to prevent harmful uses of payday loans while still allowing "people in need, and with the ability to pay, to avail themselves of these loans").

20. *See* Skiba, *supra* note 9, at 1029 ("[D]ata show that there is a need for a more nuanced examination of payday loans because, in some circumstances at least, the good outweighs the bad."); SERVON, *supra* note 1, at 82-83 (suggesting the Consumer Financial Protection Bureau planned on taking this approach in its effort to regulate payday lending). It is important to note that a laissez-faire approach to payday lending is likely inappropriate since it may be detrimental to the "efficient" borrower if she is benefited by the inefficient borrowing of those who pay back their principal in fees many times over and ought to have their access to payday loans restricted, although lenders prove incapable or unwilling to constrain them. *See* CARL PACKMAN, PAYDAY LENDING: GLOBAL GROWTH OF THE HIGH-COST CREDIT MARKET 20-21 (2014) (discussing the three types of borrowers and noting the importance of the least efficient borrowers to the early success of the payday loan industry); *cf.* Lulu Wang, Regulating Competing Payment Networks (Mar. 21, 2025) (unpublished manuscript), https://luluywang.github.io/PaperRepository/payment_jmp.pdf [https://perma.cc/8BY3-WSSK] (noting the cross subsidy all consumers pay to support credit card rewards programs, which are partially funded by increased fees charged to merchants).

21. New State Ice Co. v. Liebmann, 285 U.S. 262, 311 (1932) (Brandeis, J., dissenting) ("It is one of the happy incidents of the federal system that a single courageous state may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country."); *see generally* Steven G. Calabresi, *"A Government of Limited and Enumerated Powers": In Defense of* United States v. Lopez, 94 MICH. L. REV. 752, 774-79 (1995) (outlining the benefits of a decentralized federalist government).

22. *See infra* Subsection I.B.2.

23. *See infra* Subsection I.B.1.

Notwithstanding the significant literature surrounding payday loans and the myriad regulations affecting the industry, scholars are still trying to draw policy conclusions from the payday loan cost-benefit analysis—or at least understand what "it depends" on.[24] Further complicating the effect are the dynamics of an ever-evolving financial sector. This Article endeavors to make contributions on both fronts, examining the financial implications of regulation at the margin in the increasingly important world of online payday lending.

We contribute an empirical study with novel evidence of how borrowers respond to loan caps, one type of payday loan regulation at the margin, in a unique setting—online. Using an administrative dataset from a payday lender operating in the southeastern United States, we examine a natural experiment arising from an interaction between the lender's income-based loan-size rule and Tennessee's cap on loan size that applies independent of a borrower's income. These rules create a kink in the loan offer curve where the state cap, and not the lender's own loan-size rule, becomes the binding constraint on loan size for higher income borrowers. This kink enables our use of a fuzzy regression kink experimental design to produce estimates on a critical question: How do exogeneous constraints on the size of an online payday loan affect borrowers' financial outcomes?

In the first stage of the analysis, we find evidence that online payday loan borrowers are severely credit constrained: these customers borrow 57 cents of every dollar of additional credit offered by the lender, which is larger than previous estimates from similar settings.[25]

The second stage of our analysis estimates the effect of capping an online payday loan's size on total subsequent indebtedness from any type of subprime credit, late payment, and default. We find that for a $50 decrease in loan size around the state-imposed loan cap, customers borrow $615 more across other types of credit from the same lender over the next six months. For borrowers who took out close to the maximum amount permissible, who are presumably the most credit constrained, this effect is even starker. Some results on repayment behavior are statistically significant, like default, but are not economically significant.[26] These results, coupled with related but contradictory findings in settings where loan caps are higher, suggest lawmakers should consider modest increases to the loan cap. That form of regulation—at the intensive margin—is, we argue, the most prudent way to regulate payday lending.[27]

24. *See* SERVON, *supra* note 1, at 80; Malone & Skiba, *supra* note 3, at 314 ("[M]any empirical scholars, in an attempt to better inform regulation in the small-dollar lending space, have taken to quantifying the consequences (good or bad) of payday lending. Frustratingly, the research fails to find consensus. This makes informing public policy on the topic difficult.").

25. *See infra* notes 131-134 and accompanying text.

26. *See infra* Section II.C.

27. *See infra* Part III.

The remainder of the Article is organized as follows. Part I provides background on brick-and-mortar and online payday lending and surveys the relevant legislative and regulatory efforts by the federal and state governments affecting payday loans. Part II delves into our empirical study, discussing the data, methods, results, and robustness checks that comprise it. Part III grapples with the specific regulatory implications of the study in the market for payday loans before speaking to the benefits of marginal regulation more broadly. We then briefly conclude.

I. Payday Lending: Structure and Regulation

A. Primer on Payday Loans

Payday loans are easy to access. It has long been reported, for example, that payday loan establishments outnumber Starbucks and McDonalds stores combined.[28] And notwithstanding the general controversy and individualized stigma surrounding payday borrowing,[29] millions of Americans use them every year.[30] There is no universal definition of payday loan, but there are a few characteristics that help define the outer boundaries of the market.[31] This is true whether the loans are initiated through face-to-face interactions in a brick-and-mortar storefront or, as is increasingly the case, over the Internet via online lending.[32] Below, we outline the common characteristics of payday lending and situate them among other credit products in the fringe economy before highlighting the unique characteristics of online payday lending that make it a worthwhile subject of investigation.

28. *E.g.*, Carrell & Zinman, *supra* note 2, at 2810; Morgan et al., *supra* note 2, at 519. This statistic, however, may not be entirely accurate today. But nonetheless, even modern estimates demonstrate the ubiquity of payday lending. *See Innovating Against Predatory Lending Products*, FIN. HEALTH NETWORK (July 12, 2022), https://finhealthnetwork.org/innovating-against-predatory-lending-products/ [https://perma.cc/PW88-NFX7]("A recent study by the CFPB found 14,348 payday loan storefronts in the United States. By comparison, this is about the same number of Starbucks locations throughout the country and slightly more than the 14,027 McDonald's locations.").

29. *See* SERVON, *supra* note 1, at 91.

30. *See* Fulford & Shupe, *supra* note 14, at 6-8 (reporting survey results showing inter alia that "4.4 percent of consumers had taken out a payday loan in the six months prior to June 2019"); Morgan et al., *supra* note 2, at 519.

31. *What Is a Payday Loan?*, CONSUMER FIN. PROT. BUREAU (May 28, 2024), https://www.consumerfinance.gov/ask-cfpb/what-is-a-payday-loan-en-1567/ [https://perma.cc/Y2M6-G2QB].

32. Nick Bourke, Alex Horowitz, Walter Lake & Tara Roche, *Fraud and Abuse Online: Harmful Practices in Internet Payday Lending*, PEW CHARITABLE TRUSTS 3 (2014), https://www.pewtrusts.org/-/media/assets/2014/10/payday-lending-report/fraud_and_abuse_online_harmful_practices_in_internet_payday_lending.pdf [https://perma.cc/A4NV-E9PQ] ("According to industry analysts, approximately one-third of payday loans originate on the Internet, and online lenders' revenue tripled from 2006 to 2013, from $1.4 billion to $4.1 billion.").

1. Payday Lending Generally

High-cost credit products have a historical pedigree challenging that of money itself; early forms of payday lending can be traced back to the Great Depression.[33] The modern payday lending industry, however, was founded in the 1990s and spurred on by banking deregulation in the previous decade, a retreat from small-dollar lending by many banks, and a cost-of-living crisis that increased demand for credit.[34] Pawnshop owners and check cashers moved quickly to satiate this market demand, offering cash advances to the underbanked but characterizing these advances as "deferred presentment" to avoid state interest rate caps.[35] By 1998, thirty-two states permitted payday lending either explicitly or under existing small-loan laws,[36] but deferred presentment remained the defining hallmark of payday lending.

Payday lending is a form of small-dollar, short-term, high-cost lending. Lenders offer a loan of a few hundred dollars available almost immediately in exchange for an agreement from the borrowers to repay the principal amount of the loan and applicable fees on her next payday. Generally, this agreement is facilitated through deferred presentment—that is, when the loan is issued, a borrower provides a post-dated personal check that covers the full cost of the loan inclusive of fees and interest, and the lender agrees to wait until the borrower's next payday to cash it, typically two to four weeks later.[37] In lieu of writing a physical check, borrowers may instead provide some other form of authorization permitting the lender to withdraw the necessary funds from the borrower's bank account.[38] In either case, the loans typically last just one pay cycle; on the borrower's next payday,[39] the lender either cashes the check or debits the relevant bank account unless the loan is paid off in person or rolled over.[40] Fees and

33. PACKMAN, *supra* note 20, at 5 ("[T]he practice of extending credit against a postdated check, such was the original means of carrying out a payday loan transaction, dates back at least to the Great Depression.").

34. *See id.* at 17-18, 21; Scott Andrew Schaaf, Note, *From Checks to Cash: The Regulation of the Payday Lending Industry*, 5 N.C. BANKING INST. 339, 340-41, 340 n.8 (2001).

35. *See* PACKMAN, *supra* note 20, at 18.

36. *Id.*

37. *E.g.*, *What Is a Payday Loan?*, *supra* note 31.

38. *Id.*

39. *Id.* Note that both here and in our discussion of payday lending more generally, we describe the typical payday lending experience. Individual states or lenders may have policies that create variation in states' and lenders' approaches to payday lending. *See* Susan Payne Carter, Kuan Liu, Paige Marta Skiba, & Justin Sydnor, *Time to Repay or Time to Delay? The Effect of Having More Time Before a Payday Loan Is Due*, 14 AM. ECON. J.: APPLIED ECON. 91, 91-93 (2022) (exploiting a grace period in Texas law that extends a loan's due date to the second payday following origination of the loan and a lender's fee policy to assess the effects of additional repayment time on consumer welfare and ultimately conclude that borrowers fail to take advantage of the grace period to accelerate repayment of their loans).

40. A "rollover" allows a borrower to pay back the interest and fees on one loan and renew their initial loan for another pay period. Carter et al., *supra* note 39, at 92; Skiba, *supra* note 9, at 1026 n.10.

interest associated with payday loans are incredibly high—usually $15 per $100 borrowed, which equates to an annual percentage rate ("APR") of 390 percent for a two-week loan.[41] Nonetheless, the consequences of defaulting are somewhat diminished since most payday lenders do not report to any of the major credit bureaus.[42] On the other hand, paying back the loan will not help a borrower build or improve their credit score either.[43]

2. Online Payday Lending

Online payday loans, the subject of our present study, are an increasingly central part of the payday-lending market. Roughly 30-45 percent of all payday loans originate online, a number that will likely continue increasing.[44] Online payday lending operates analogously to storefront lending for the most part, but with several important differences. These differences primarily center on the cost and payment structures of online payday loans as well as the consequences these differences produce.

Idiosyncrasies of online payday lending lead to stark differences in the cost structure for loans. Although overhead for online lending is substantially lower than for brick-and-mortar lenders, interest rates for online loans are substantially higher.[45] Online loans have APRs that are 100-250+ percentage points higher than storefront loans.[46] The rate incongruity is likely a function of the heightened risk of default in online lending. While lenders refuse to individualize rates, they do appear to engage in statistical discrimination, increasing rates for the class of online borrowers relative to brick-and-mortar borrowers given the collective risk profile of the former group.[47] It has been hypothesized that the disparity is due to information

41. Skiba, *supra* note 9, at 1027. For comparison, even in today's high-interest market era, the average APR on a credit card is still below 30 percent. Evan Coleman & Jerod Morales, *What Is the Average Credit Card Interest Rate This Week? March 24, 2025*, FORBES (Mar. 24, 2025, 11:55 AM), https://www.forbes.com/advisor/credit-cards/average-credit-card-interest-rate [https://perma.cc/RHT7-KY63].

42. SERVON, *supra* note 1, at 84.

43. *Id.*

44. Bourke et al., *supra* note 32, at 3 ("Storefront loans still account for the majority of the payday lending marketplace, but online lending has grown substantially since 2006. According to industry analysts, approximately one-third of payday loans originate on the Internet, and online lenders' revenue tripled from 2006 to 2013, from $1.4 billion to $4.1 billion."); Filipe Correia, Peter Han & Jialan Wang, The Online Payday Loan Premium 6 (Sept. 2024) (unpublished manuscript), https://www.dropbox.com/scl/fi/jskignxftfinldunzmpbb/Correia-Han-Wang-2024-The-Online-Payday-Loan-Premium.pdf?rlkey=3rr18iau3bwwsttzdd3oti3f4&e=1&dl=0 [https://perma.cc/VC63-35FK] ("The online payday industry grew from a small share of loans to significant market share over the 2010s, reaching a steady state of between 35% to 45% of the overall payday market between 2013 and 2019 . . . .").

45. Bourke et al., *supra* note 32, at 3-4.

46. *Id.* at 3 (reporting an average APR of 391 for storefront lenders versus an APR of 652 for online lenders); Correia et al., *supra* note 44, at 32 ("[W]e show that despite the potential for online technology to lower fixed costs and increase lending efficiency, online payday loans incur a higher cost by $4 per $100 or 100 [percentage points] APR, even conditioning on loan and customer characteristics.").

47. Correia et al., *supra* note 44, at 2.

asymmetries in the market—a result of "the intricate network of affiliates, ping trees, lead generators, and aggregators" that support the online payday market.[48]

These intricacies also contribute to issues related to online loans' payment structures. Since so much online lending is facilitated by lead generators (i.e., firms that collect borrowers' information and use it to connect them with lenders) and repeated sales of borrowers' information are common (even if unauthorized by the borrower[49]), borrowers' information may easily fall into the wrong hands—or at least, into hands the borrower is not familiar with.[50] The data threat is heightened in an online setting because online borrowers cannot offer a physical check as collateral for their loans, so instead, they often provide direct access to their bank accounts. This allows lenders to use the Automated Clearing House payment system operated by banks to deposit and withdraw funds.[51] As such, when lenders mishandle borrower data, they open borrowers up to fraud, identity theft, or other illegitimate attempts to withdraw bank funds.[52] For example, survey data shows that one-third of online payday loan borrowers have experienced an unauthorized withdrawal, and 20 percent have received an unauthorized loan.[53] Borrowers often have to take drastic measures to combat these abuses: online payday loan borrowers are twice as likely to close their bank account to avoid additional withdrawals than storefront borrowers.[54] Understandably, these issues have generated significant complaints from borrowers. While accounting for less than half of the payday loan market, 89 percent of payday loan complaints are levied against online lenders, mostly relating to billing and collection practices.[55]

The online market's characteristics invite exploitation of consumers that subsequently invites regulation. But effective regulation of online payday lending may need to come at the federal level, since the stateless nature of the Internet allows lenders to thwart unfavorable state law by setting up shop in a state with more lax payday loan regulations.[56] Rules that apply

48. *Id.* at 31.

49. *See id.* at 7; Andrew R. Johnson, *Middlemen for Payday Lenders Under Fire*, WALL ST. J. (Apr. 7, 2014, 9:50 PM), https://www.wsj.com/articles/SB10001424052702304819004579487983000120324 [https://perma.cc/5LPP-SCVW].

50. Bourke et al., *supra* note 32, at 5, 11-13.

51. *Id.* at 3.

52. *Id.* at 5, 11-15.

53. *Id.* at 14-15.

54. *Id.* at 16. But closing an account alone may not be sufficient to stop withdrawals. Some lenders have used the information associated with the account to identify other accounts that belong to the borrower, and some banks have even reopened accounts to process lenders' transactions. *Id.*

55. *Id.* at 18-19.

56. *See* Nyanya Browne, *Lured into Debt: How Payday Loans and Paycheck Apps Exacerbate Financial Struggles in Underserved Communities*, HOWARD U. COLL. ARTS & SCIS., https://coascenters.howard.edu/lured-debt-how-payday-loans-and-paycheck-apps-exacerbate-financial-struggles-underserved [https://perma.cc/ARF2-YEVT] (last visited Mar. 22, 2025) ("The online lending landscape veers into illegality and deception. In an increasingly interconnected

nationally, like Google's 2016 decision to ban payday lending advertisements on its search engine,[57] may overcome lenders' efforts to thwart regulation. Nonetheless, such sweeping regulatory intervention may, in the long term, undermine attempts at marginal regulation that seek to reduce the inefficient use of payday loans without disincentivizing efficient uses.

B. Regulating Payday Loans

Because of payday loans' high interest rates, short maturation, and low-income customer base, federal and state regulators have attempted to limit their use. States have largely been regulating at the extensive margin (restricting loan sizes, requiring information disclosures, mandating loan lengths, and capping interest rates) and the intensive margin (experimenting with the stringency of these interventions), but some regulations are less marginal, seeking to close the payday loan market entirely. At the federal level, payday loans are subject to standard lending regulations, but the path to more tailored federal intervention has been winding. We describe that path below before turning to the myriad regulatory efforts undertaken in the states.

1. Federal Regulatory Floor

While payday lenders are regulated like most other lenders under federal law, the rapid rise of the industry in the 1990s invited increased scrutiny from elected officials and federal regulators. Through the early 2000s, a patchwork of laws governed the payday lending industry—including the Community Reinvestment Act, Truth in Lending Act, Equal Credit Opportunity Act, Fair Credit Reporting Act, Electronic Fund Transfer Act, Fair Debt Collection Practices Act, and Federal Trade Commission Act.[58] In the wake of the Great Recession, however, these legacy statutes were supplemented by the Dodd–Frank Wall Street Reform and Consumer Protection Act. One of the law's major innovations was the Consumer Financial Protection Bureau (CFPB), an "independent watchdog, housed at the Federal Reserve, with the authority to ensure American consumers get the clear, accurate information they need to shop for mortgages, credit cards,

world, online lenders have ventured across state lines, sometimes connecting applicants from licensed states to lead generators for states where their services are not offered."); SERVON, *supra* note 1, at 87-88. *But cf.* Stephen Nuñez, Kelsey Schaberg & Richard Hendra with Lisa Servon, Mina Addo & Andrea Mapillero-Colomina, *Online Payday and Installment Loans: Who Uses Them and Why?*, MDRC *with* NEW SCH. 59-60 (2016), https://www.mdrc.org/sites/default/files/online_payday_2016_FR.pdf [https://perma.cc/LH4M-5Y6G] ("State-level regulations on storefront lending appear to reduce usage of online loans.").

57. Christine Hauser, *Google to Ban All Payday Loan Ads*, N.Y. TIMES (May 11, 2016), https://www.nytimes.com/2016/05/12/business/google-to-ban-all-payday-loan-ads.html [https://perma.cc/KAN2-KQXD].

58. *Guidelines for Payday Lending*, FED. DEPOSIT INS. CORP. 8-10, https://archive.fdic.gov/view/fdic/2292/fdic_2292_DS2.pdf [https://perma.cc/9E9Q-BNFC].

and other financial products, and protect them from hidden fees, abusive terms, and deceptive practices."[59]

To date, the CFPB's regulatory interventions in the payday market have been limited. After several years of information gathering, in 2016 the CFPB issued a Notice of Proposed Rulemaking for a two-part regulation centered on payday and other subprime lending.[60] Issued in October 2017, the Final Rule prevented lenders from making repeated attempts to withdraw funds from borrowers' checking accounts (the "Withdraw Rule") and required some means testing of borrowers before lenders could issue loans (the "Underwriting Rule").[61] A shakeup at the CFPB during the first Trump Administration[62] ultimately led to the revocation of the Underwriting Rule in July 2020,[63] but the Withdraw Rule has avoided direct repeal so far.[64]

Even though the Withdraw Rule remains enforceable, the second Trump Administration seems poised to let the CFPB wither. Soon after retaking office, President Trump named the Treasury Secretary, Scott Bessent, as acting director of the CFPB,[65] then promptly replaced him with the Director of the Office of Management and Budget, Russell Vought.[66] In

59. *Brief Summary of the Dodd-Frank Wall Street Reform and Consumer Protection Act*, SENATE DEMOCRATIC PARTY CAUCUS 1, https://www.dpc.senate.gov/pdf/wall_street_reform_summary.pdf [https://perma.cc/WV2B-69NK].

60. Payday, Vehicle Title, and Certain High-Cost Installment Loans, 81 Fed. Reg. 47864 (proposed July 22, 2016) (to be codified at 12 C.F.R. pt. 1041). For a more complete history of the CFPB's regulatory efforts, see *Payday Loan Protections*, CONSUMER FIN. PROC. BUREAU, https://www.consumerfinance.gov/payday-rule [https://perma.cc/YK64-E77R].

61. Payday, Vehicle Title, and Certain High-Cost Installment Loans, 82 Fed. Reg. 54472 (Nov. 17, 2017) (codified at 12 C.F.R. 1041 but repealed in part in 2020, 85 Fed. Reg. 44382 (July 22, 2020)).

62. Richard Cordray was appointed by President Obama as the first Director of the CFPB, but when Mr. Cordray stepped down in 2017, he appointed Leandra English (then the agency chief of staff) Deputy Director. In the role, Ms. English was set to lead the CFPB in an interim capacity until the Senate approved a Trump appointee. Skeptical of the agency's actions and its constitutionality more broadly, President Trump designated Mick Mulvaney (then Director of the Office of Management and Budget) as acting CFPB Director. Yuka Hayashi, *Fight Erupts Over CFPB Interim Leadership*, WALL ST. J. (Nov. 24, 2017, 9:50 PM), https://www.wsj.com/articles/cordray-names-own-successor-at-cfpb-in-challenge-to-trump-1511561735 [https://perma.cc/BC97-9W8H]. There was a brief period of confusion over who was leading the agency (Mr. Mulvaney or Ms. English) before Ms. English eventually dropped her challenge and resigned the following summer. Victoria Guida & Katy O'Donnell, *Battle Over CFPB Leadership Ends as Mulvaney Challenger Resigns*, POLITICO (July 6, 2018, 4:32 PM), https://www.politico.com/story/2018/07/06/consumer-financial-protection-bureau-leadership-battle-674254 [https://perma.cc/87VB-9PL9].

63. Payday, Vehicle Title, and Certain High-Cost Installment Loans, 85 Fed. Reg. 44382 (July 22, 2020).

64. The constitutionality of the CFPB and the Withdraw Rule were upheld in *CFPB v. Consumer Financial Services Administration*, 601 U.S. 416 (2024).

65. Laurel Wamsley, *Treasury Secretary Bessent, Tapped to Run CFPB, Orders Staff to Halt Work*, NPR (Feb. 4, 2025, 10:28 AM), https://www.npr.org/2025/02/03/nx-s1-5285356/treasury-secretary-bessent-acting-cfpb-director [https://perma.cc/C7K8-SEBQ].

66. Holly Otterbein & Megan Messerly, *Vought Takes Helm at CFPB After Musk Incursion*, POLITICO (Feb. 8, 2025, 12:03 AM), https://www.politico.com/news/2025/02/08/vought-takes-helm-at-cfpb-after-musk-incursion-00203247 [https://perma.cc/5JDF-LUQD].

his capacity as Acting Director and as part of a broader restructuring of the executive branch, Mr. Vought brought all CFPB work to a halt and closed the agency's Washington, D.C., headquarters.[67] While the future of the CFPB and its staff remains uncertain, the Agency seems unlikely to promulgate robust payday loan regulation in the near term.[68]

The Withdraw Rule, guided by years of research from the CFPB, was not the most intrusive regulatory intervention conceivable. Rather, it was arguably a form of marginal regulation, as some have acknowledged.[69] But federal regulation is both less and more marginal than state regulation. It is less marginal because, whenever the CFPB implements a regulation, lenders in *every* state are bound by it, which may preempt some state regulations.[70] However, federal regulations are also necessarily limited in their permissible scope compared to state regulations—and are thus more marginal in this regard.[71] Notwithstanding the alphabet soup of federal laws regulating payday lenders, the federal government lacks important authority over (or motivation to regulate) certain central aspects of the payday loan industry's pricing and lending practices. This makes some marginal regulations unavailable to federal regulators. By contrast, the states, with their plenary authority to govern, are not so constrained.

2. States as Laboratories of Democracy

With new federal intervention in the payday loan market unlikely, at least for the foreseeable future, states will retain their role as the primary regulators of subprime lending. As the primary regulators in this area, the

67. Laurel Wamsley, *New CFPB Chief Closes Headquarters, Tells All Staff They Must Not Do 'Any Work Tasks,'* NPR (Feb. 10, 2025, 10:47 AM), https://www.npr.org/2025/02/08/nx-s1-5290914/russell-vought-cfpb-doge-access-musk [https://perma.cc/K7NL-URYS].

68. *See* Stacy Cowley, *Judge Orders Freeze on Firing Consumer Bureau's Staff and Deleting Its Data*, N.Y. TIMES (Feb. 14, 2025), https://www.nytimes.com/2025/02/14/us/politics/judge-cfpb-doge-trump.html [https://perma.cc/J8MB-5HQQ]; Stacy Cowley, *Left for Dead, the C.F.P.B. Inches Back to Life*, N.Y. TIMES (Mar. 15, 2025), https://www.nytimes.com/2025/03/15/business/trump-cfpb.html [https://perma.cc/6XPK-VMD7]. Some have suggested a weakened role for the CFPB is less concerning than it appears, not because state regulations can fill the void but because the plaintiff's bar and state attorneys general are still poised to hold lenders accountable through the courts. *See* Brian T. Fitzpatrick, Opinion, *We Don't Need the Consumer Financial Protection Bureau–We Have the Courts*, HILL (Mar. 15, 2025), https://thehill.com/opinion/5195681-trump-drops-cfpb-cases [https://perma.cc/L8KA-VUDU].

69. *See* SERVON, *supra* note 1, at 82-83 ("Pressure on policymakers to stem the perceived damage from these loans is strong, however, and the CFPB is responding, doing its best to implement policy that allows people in need, and with the ability to pay, to avail themselves of these loans."); Skiba, *supra* note 9, at 1025-26 (quoting CFPB Director Richard Cordray where he acknowledges the need to use regulation to limit payday loan harms while "recogniz[ing] the need for emergency credit").

70. *See* U.S. CONST. art. VI, cl. 2.

71. *See* United States v. Lopez, 514 U.S. 549, 592 (1995) (Thomas, J., concurring) ("The comments of Hamilton and others about federal power reflected the well-known truth that the new Government would have only the limited and enumerated powers found in the Constitution."); *see also* U.S. CONST. amend. X.

states have truly acted as laboratories of democracy.[72] We briefly survey the variety of state regulations below, and discuss several recent state efforts to rethink payday loan regulations more holistically.

Bans. The most extreme state response to payday lending has been to ban the practice. For example, Georgia passed a statute pronouncing payday lending illegal in the state, after similar earlier enactments failed to eradicate the industry.[73] Other states have enacted de facto bans by applying usury rate caps to payday lending to make it financially infeasible.[74] For example, Colorado,[75] Montana,[76] Nebraska,[77] New Hampshire,[78] Oregon,[79] South Dakota,[80] and Virginia[81] each have 36 percent interest rate caps in place, effectively banning the practice in their jurisdictions.

A ban is the opposite of marginal regulation since it destroys the entire market, including its beneficial parts. These laws are often motivated by a belief that payday lending is inherently bad. In Colorado, former Senate President Peter Groff described payday lending as inherently immoral: "Going back to biblical times, governments have tried to deal with this immoral practice. It was wrong back in biblical times, and it's wrong today."[82] Empirical evidence, however, suggests that bans have not delivered net benefits for borrowers. After Georgia and North Carolina banned payday lending in 2004 and 2005, respectively, a study examined the effects of the bans. Compared to households in states without such bans, households in Georgia filed for bankruptcy more often, bounced checks more frequently, and were more likely to file complaints with the Federal Trade Commission about lenders and debt collectors.[83]

Further research has demonstrated that elimination of payday lending prompts a shift in consumer borrowing to other high-interest credit products, like pawnshop loans, likely because the elimination of payday loans

72. *See* SERVON, *supra* note 1, at 82 ("[S]tates have placed restrictions on the payday industry—limiting the number of loans a borrower can have, requiring cooling-off periods, and allowing storefront but not online lending.").

73. GA. CODE ANN. § 16-17-1 (2024).

74. PACKMAN, *supra* note 20, at 17; *see* John Y. Campbell, Howell E. Jackson, Brigitte C. Madrian & Peter Tufano, *Consumer Financial Protection*, 25 J. ECON. PERSPS. 91, 102-03 (2011).

75. COLO. REV. STAT. ANN. § 5-1.3-105 (West 2025).

76. MONT. CODE ANN. § 31-1-722(2) (West 2025).

77. NEB. REV. STAT. ANN. § 45-918(1) (West 2025).

78. N.H. REV. STAT. ANN. § 399-A:17(I) (2025).

79. OR. REV. STAT. ANN. § 725A.064(1) (West 2025).

80. S.D. CODIFIED LAWS § 54-4-44 (2025).

81. VA. CODE ANN. § 6.2-1817 (West 2025).

82. Tim Hoover, *Senators Back Cap on Payday Lending*, DENVER POST (Mar. 25, 2008), https://www.denverpost.com/2008/03/25/senators-back-cap-on-payday-lending [https://perma.cc/6V44-Q5Z6].

83. Donald P. Morgan & Michael R. Strain, *Payday Holiday: How Households Fare After Payday Credit Bans*, FED. RSRV. BANK OF NEW YORK STAFF REPS. NO. 309 (2008), https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr309.pdf [https://perma.cc/4JA7-NLRU]. *But see* Morgan et al., *supra* note 2 (finding a decrease in bankruptcies after payday loan bans took effect but increases in complaints, bounced checks, and overdraft fees paid).

in isolation leaves affected borrowers' credit needs unsatisfied.[84] As another Colorado lawmaker quipped in response to Senator Groff, wholesale "economic paternalism" could ultimately harm consumers by financially tying their hands.[85] While far from conclusive, the empirical evidence suggests that bans, whether de jure or de facto, sweep too broadly and fail to universally deliver promised benefits, suggesting that policymakers ought to avoid this intervention as a standalone consumer-protection measure.

Loan Size. In states where payday loans are permitted, the size of loans is frequently capped, usually around $500. For example, Iowa,[86] Kansas,[87] and Kentucky[88] have caps in place. These caps are often intertwined with caps on the fees that lenders can collect for payday loans, normally 15 percent of the size of the loan.[89] Iowa is unique in that it staggers fees based on loan size (i.e., 15 percent for the first $100 and 10 percent for each dollar thereafter up to the $500 loan cap).[90] Such changes in lending policy, a simple dynamic interest rate cap or a change in the loan size cap,[91] are exemplary of the sort of regulation possible at the intensive margin of a state's payday lending regulatory regime.

Marginal tweaking of loan caps is especially appropriate since there is mixed empirical evidence on the usefulness of caps. For example, adverse selection into large payday loans is well documented (i.e., the borrowers most inclined to take out larger loans are also the ones least likely to pay them back).[92] Notwithstanding the adverse selection in the market, Will Dobbie and Paige Marta Skiba show that access to a payday loan that is fifty dollars larger reduces the likelihood of default by 17-23 percent, even as they find that borrowers who choose larger loans are more likely to default.[93] These results, while perhaps initially counterintuitive, suggest that capping loan sizes at the wrong level may be detrimental to the average borrowers' financial well-being—as our results below similarly show. The uncertainty should motivate continued state experimentation at the margins.[94]

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84. Neil Bhutta, Jacob Goldin & Tatiana Homonoff, *Consumer Borrowing After Payday Loan Bans*, 59 J. L. & ECON. 225 (2016); *cf.* Bhutta et al., *supra* note 2, at 224-25 (noting the payday loan users' limited credit options).

85. Hoover, *supra* note 82.

86. IOWA CODE ANN. § 533D.10(1)(b) (West 2024).

87. KAN. STAT. ANN. § 16a-2-404(1)(c) (West 2025).

88. KY. REV. STAT. ANN. § 286.9-100(9) (West 2025).

89. *E.g.*, KAN. STAT. ANN. § 16a-2-404(1)(c) (West 2025); KY. REV. STAT. ANN. § 286.9-100(1)(b) (West 2025).

90. IOWA CODE ANN. § 533D.9(1) (West 2024).

91. Louisiana, for example, caps loans at $350, not $500 like many other states. LA. STAT. ANN. § 3578.3(2)(c) (2024).

92. Skiba, *supra* note 9, at 1033.

93. Will Dobbie & Paige Marta Skiba, *Information Asymmetries in Consumer Credit Markets: Evidence from Payday Lending*, 5 AM. ECON. J.: APPLIED ECON. 256, 258 (2013).

94. *See infra* Subsection II.C.2.

Information Disclosures. Other state payday loan regulations are considerably less paternalistic than bans or loan-size caps. Required information disclosures are one such state-level intervention, although federal law includes myriad disclosure requirements as well.[95] For example, in 2011, inspired by a Department of Labor–funded study by Marianne Bertrand and Adair Morse, Texas enacted several disclosure regulations aimed at payday lenders.[96] Under the Texas law, payday lenders are required to disclose payday loan APR alongside the APR for other sources of credit, the renewal patterns of a normal payday loan borrower (i.e., 40 percent renewing five or more times), and comparisons showing the fees that accumulate on a payday loan alongside the analogous fees for borrowing on a credit card.[97]

The Texas law prompted a 12 percent decline in loan volume, which was causally linked to the intervention[98]—a result similar to the 11 percent reduction Bertrand and Morse reported in their study.[99] Despite these seemingly positive results, the effectiveness of information disclosures in credit markets is generally limited, and it is not clear that taking out fewer loans translates to improved financial health for borrowers.[100] Prior payday lending research suggests that the limited effects of disclosures are attributable to borrowers' behavioral biases: even when consumers better understand interest rates,[101] they still underestimate how long it will take them to repay their loans, leading to inefficient borrowing and repayment

95. *See* Skiba, *supra* note 9, at 1043-44 (discussing disclosure requirements in the Truth in Lending Act).

96. Jialan Wang & Kathleen Burke, *The Effects of Disclosure and Enforcement on Payday Lending in Texas*¸145 J. FIN. ECON. 489, 490 (2022).

97. TEX. FIN. CODE ANN. § 393.223(a) (West 2023); *see* Thanh Tan, *Senate OKs Bills Regulating Payday Lenders*, TEX. TRIB. (May 23, 2011, 10:00 PM), https://www.texastribune.org/2011/05/23/texas-senate-oks-bills-regulating-payday-lenders [https://perma.cc/N4F4-T5PB]. Some states, however, take a more direct approach to mandated disclosures. *See* IND. CODE ANN. § 24-4.5-7-301(2) (West 2024) (requiring lenders to "conspicuously display in bold type" the following: "WARNING: A small loan is not intended to meet long term financial needs. A small loan should be used only to meet short term cash needs. The cost of your small loan may be higher than loans offered by other lending institutions.").

98. Wang & Burke, *supra* note 96, at 501.

99. Marianne Bertrand & Adair Morse, *Information Disclosure, Cognitive Biases, and Payday Borrowing*, 66 J. FIN. 1865, 1881 (2011) (examining the effects of the policies Texas enacted individually).

100. *See, e.g.*, Enrique Seira, Alan Elizondo & Eduardo Laguna-Müggenburg, *Are Information Disclosures Effective? Evidence from the Credit Card Market*, 9 AM. ECON. J.: ECON. POL'Y 277 (2017) (analyzing of the effectiveness of information disclosures in credit card markets and finding null or modest effects on consumer behavior); Bhutta et al., *supra* note 84, at 256 ("Our results suggest that these restrictions are effective at curbing the use of payday loans; . . . [h]owever[,] we also found that this reduction in payday loan use is accompanied by an increase in the use of pawnshop loans, with no effect on the use of credit card debt or consumer finance loans.").

101. *See* Campbell et al., *supra* note 74, at 92-95 (discussing the role information plays in financial markets and consumers' difficulty understanding and acting on this information effectively).

behavior.[102] Although information disclosures are the bread and butter of consumer financial protection, their limited impact should be considered carefully by policymakers.

Loan Lengths. More directly targeted at the behavioral biases of payday borrowers, other state regulations augment the repayment structure of payday loans. These regulations come in two flavors: Some states, like Colorado,[103] mandate minimum loan repayment periods, so instead of a loan maturing on the borrower's next payday, the loan comes due several months after origination. Other states, like Wisconsin,[104] more directly target the myopic, overly optimistic borrower by capping how many times a payday loan can be rolled over.

Unfortunately, empirical research into the effects of lengthier repayment terms demonstrates their limited impact on repayment and rollover behavior, likely a result of borrowers' cognitive biases and inconsistent time preferences. This suggests that increased loan lengths alone are insufficient to improve repayment behavior.[105]

By contrast, explicitly limiting the number of rollovers seems more promising as an intervention because the regulation helps overcome these cognitive biases.[106] Skiba and Jeremy Tobacman find that more than 50 percent of payday loan borrowers default in the first year after origination, but only after they have repaid and serviced the equivalent of five payday loans. This, they argue, is consistent with borrowers' naïve quasi-hyperbolic discounting—a form of inconsistent time preference wherein consumers overweight the value of immediate benefits while remaining oblivious to the fact that they will feel this way in the future too, leaving borrowers unable to repay loans in the longer term.[107] Experimenting with regulations like rollover limits, which respond to market failures in practice without destroying the entire market, is another example of commendable marginal regulation.

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102. *See* Paige Marta Skiba & Jeremy Tobacman, *Payday Loans, Uncertainty, and Discounting: Explaining Patterns of Borrowing, Repayment, and Default* 2-3 (Vand. U.L. & Econ. Rsch. Paper No. 08-33, 2008), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1319751 [https://perma.cc/WXU6-9UZH]. *But see* Ronald Mann, *Assessing the Optimism of Payday Loan Borrowers*, 21 SUP. CT. ECON. REV. 105, 118 (2014) (finding that many borrowers reasonably predict repayment and borrowing behavior).

103. COLO. REV. STAT. ANN. § 5-3.1-103 (West 2025) ("The minimum loan term shall be six months from the loan transaction date.").

104. WIS. STAT. ANN. § 138.14(12)(a) (West 2024) ("A customer may repay a payday loan with the proceeds of a subsequent payday loan made by the same or another licensee, but if the customer does so, the customer may not repay the subsequent payday loan with the proceeds of another payday loan . . . ."); *see also* COLO. REV. STAT. ANN. § 5-3.1-108(1) (West 2025) ("A deferred deposit loan shall not be renewed more than once. After such renewal, the consumer shall pay the debt in cash or its equivalent. If the consumer does not pay the debt, then the lender may deposit the consumer's instrument.").

105. Carter et al., *supra* note 39, at 124.

106. *See* Skiba, *supra* note 9, at 1031-32.

107. Skiba & Tobacman, *supra* note 102, at 1, 21.

Payday loan regulation comes in many forms, and aside from bans, states have many options for regulating payday lending at the margin.[108] Shrouded by the inconclusive evidence concerning regulations of payday lending generally, however, is the significant gap in the research concerning the regulation of *online* payday lending. As this form of payday lending becomes increasingly prominent and expands to new platforms like phone apps,[109] policymakers run the risk of falling behind,[110] allowing inefficiencies and abuse to consume the market. The urge to abandon prudent marginal regulation in such a setting will be great, but policymakers should resist and look to empirical studies, like the one presented here, to inform marginal regulations that suppress inefficient payday lending while preserving access to credit for efficient users of these loans.[111]

II. Empirical Analysis: Caps on Payday Loan Size

The present study seeks to fill a gap in the payday lending literature centered around online payday lending and the effects of loan limits on consumer welfare. Our hope is that the study, and the subsequent work it informs, will be useful to policymakers in crafting (online) payday loan regulation at the margin. After describing the proprietary dataset underlying the study, we describe the empirical methods that enable this work. We then present our results and describe the robustness checks that further support them.

A. Data

The study utilizes a restricted-access, proprietary dataset provided by a large financial services company operating in Tennessee ("Company").[112] For Company, as for many payday loan firms, the borrower's application process is straightforward, and funds can be deposited into a borrower's account within twenty-four hours. When applying for an online loan, a

108. *See* SERVON, *supra* note 1, at 82-83.

109. *See* Pamela Foohey & Nathalie Martin, *Fintech's Role in Exacerbating or Reducing the Wealth Gap*, 2021 U. ILL. L. REV. 459, 488-99 (2021) (describing advanced financial technologies that offer potential alternatives to traditional payday lending); *see also* Annie Millerbernd & Kime Lowe, *6 Top Cash Advance Apps in 2025*, NERD WALLET (Jan. 31, 2025), https://www.nerdwallet.com/article/loans/personal-loans/loan-apps [https://perma.cc/GR3A-BNHZ] ("Cash advance apps like EarnIn, Dave and Brigit let you borrow a small amount from your next paycheck before you receive it. This quick fix may help if you need cash in an emergency, but it's smart to consider cheaper options before you borrow through a cash advance app.").

110. *Cf.* PACKMAN, *supra* note 20, at 21-27 (describing the evolution of the payday lending industry and the regulation that tried to keep up with changes).

111. *See* SERVON, *supra* note 1, at 82-83 (noting the pressures on regulators to "stem the perceived damage").

112. Here, we introduce the "Company" to avoid confusing the particular firm from which the data are derived (i.e., Company) from financial services firms (banks, credit unions, pawnshops, other payday lenders, etc.) generally, which may or may not have the same lending policies and practices as Company.

customer need only go to Company's website and upload a copy of government-issued identification, a bank statement, her most recent pay stub, and her debit card information. Within fifteen minutes, the documents are verified by Company employees and loans of up to 25.5 percent of the borrower's monthly income may be approved. At no point does Company use any credit scoring or engage in risk-based pricing; all lending and pricing decisions are based on the borrower's income as determined by her most recent pay stub. To be approved for an online loan, however, a borrower must have a verifiable income and receive her paycheck through direct deposit. The direct deposit requirement and banking and debit card information provided in the application enable Company to directly withdraw the amount owed once the loan comes due on the borrower's next payday.[113]

Company offers payday loans (both online and through storefronts), auto-title loans,[114] and installment loans,[115] which borrowers can and often do use concurrently or successively. The dataset includes every online payday loan issued by Company and originating in Tennessee from May 2013 through June 2014. We focus on Tennessee not only because it is the birthplace of the payday lending industry[116] but also because of Tennessee's $500 cap on payday loans.[117] No more than $425 is ever issued to a borrower, however, since Company retains $75 in fees and interest.[118] The State's statutory cap enables us to use a regression-kink design, discussed below, when the statutory cap is combined with Company's income-based loan restrictions.

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113. Over half of the borrowers in the dataset are paid every two weeks, but 16 percent are paid monthly, which would enable a longer repayment period. *See infra* Table 1; *see also* Carter et al., *supra* note 39, at 101 (exploiting exogenous variation in payday loan length to measure the effects of longer repayment times on borrower repayment). Tennessee has no statutory minimum loan length, although it does have a thirty-one day maximum repayment period. TENN. CODE ANN. § 45-17-112(d) ("A licensee shall not defer presentment of any personal check for more than thirty-one (31) calendar days after the date the check is tendered to the licensee.").

114. With auto-title loans, a borrower receives cash but offers her car's title as collateral. The loans have interest rates similar to payday loans, but the loan terms are usually longer, typically thirty days. Auto-title loan sizes are ultimately determined by the value of a borrower's car but can be as large as $2,500.

115. Installment loans are larger than payday loans ($575 on average with a $2,000 state cap in Tennessee) and require monthly interest payments. The typical installment loan lasts seven months with an APR of 100%.

116. Daniel Brook, *Usury Country*, HARPER'S MAG. (Apr. 2009), https://harpers.org/archive/2009/04/usury-country [https://perma.cc/E8NK-GAN7]; *Tennessee Payday Loans: Law, Stats and History*, USTATESLOANS.ORG, https://ustatesloans.org/law/tn/#:~:text=In%20the%20state%20of%20Tennessee,the%20amount%20of%20the%20check [https://perma.cc/296Z-SD3Q] (Dec. 2020) ("The state of Tennessee is considered the place where payday loans first originated.").

117. TENN. CODE ANN. § 45-17-112(o) (West 2025). The cap was initiated in 1997 and was in place during the whole observation period. 1997 TENN. PUB. ACTS CH. 255, § 13.

118. While the true loan cap is $500, meaning the borrower may authorize withdrawal of up to $500 on her next payday, Company and other payday lenders take out fees as permitted by law (no more than $15 per $100 of the face amount of the check in Tennessee), which reduces the face value of the maximum loan that may be issued to a borrower to $425. TENN. CODE ANN. § 45-17-112(b) (West 2025).

Our focus on Tennessee may limit the generalizability of this research, insofar as the state has demographically unique borrowers or other state-specific regulations that affect borrower behavior. Still, our study is a useful first look at the value of one type of online payday loan regulation that can provide a foundation for further, more generalized study.

The sample includes 10,212 online payday loans from 1,251 unique borrowers. Sixty-five percent of borrowers are paid biweekly or semimonthly, with average net income of $914 and $1,150 per paycheck, respectively. The majority of borrowers (67 percent) are female, which is consistent with other estimates in the literature suggesting women are more likely to utilize payday loans and other alternative financial services.[119] The mean first-time loan is issued for roughly $292. Although borrowers paid weekly receive smaller loans on average ($218), these loans constitute a larger percentage of the borrowers' next paycheck on average (49 percent) compared to borrowers with different pay cycles. The default rate on first-time loans is fairly low at 2.3 percent, but late payments are much more common, occurring with 32 percent of loans. Complete summary statistics are shown in Table 1.

Table 1: Online Payday Loan Sample Summary Statistics[120]

Pay Cycle	Average Loan Size	Average Net Paycheck When Loan Is Issued	Percent of All Borrowers
Weekly	$218	$447	18%
Biweekly	$305	$914	51%
Semimonthly	$322	$1,150	14%
Monthly	$309	$1,785	16%
		Percent of Loans in Default	2.3%
		Percent of Loans with Late Payments	32%
		Percent of Borrowers Identified as Males	33%
		Total Number of Borrowers	1,251
		Total Number of Loans	10,212

119. Fulford & Shupe, *supra* note 14, at 9 (finding 60 percent of payday loan users to be female); *Payday Loan Debt Statistics*, DEBTHAMMER, https://debthammer.org/payday-loan-debt-statistics [https://perma.cc/TFF9-YJXP] ("Of those we surveyed, 74% were female, 25% were male, and 0.5% identified as either non-binary/other or preferred not to say.").

120. Data capture customers of and online payday loans issued by Company that originated in Tennessee between May 2013 and June 2014, limited to first-time borrowers. Only Number of Loans captures information beyond the first loan issued to the borrower.

B. Methods

The goal of our empirical study is to estimate the causal effect of loan size on future indebtedness and loan repayment. Simple as it may seem, the goal is elusive owing to the endogeneity problem: both the independent variable (loan size) and dependent variables (repayment and future indebtedness) are partially determined by a common third variable, the borrower's income.

Since 1999, economists have increasingly utilized the regression discontinuity design (RDD) as an empirical method for overcoming endogeneity.[121] RDD is appropriate when treatment is determined by a binary decision rule around a cutoff value in a continuous observable variable, which is called the running variable.[122] For example, researchers might use RDD to study the effect of state Medicaid benefits (the treatment) that are only available to families below a certain income (the running variable). Assuming (Medicaid eligible) families just below the income cutoff are identical to (Medicaid ineligible) families just above it, researchers could attribute any differences in the groups' long-term outcomes to the treatment, Medicaid enrollment. However, RDD is inappropriate in the context examined here because there is no binary treatment (i.e., loan size) based on the running variable (i.e., income). Instead, Company will issue loans to borrowers at all income levels, and the size of these loans varies continuously with income.[123]

The more appropriate design—and the one utilized in this study—is a regression kink design (RKD), an extension of RDD. With RKD, there need not be a binary treatment decision around a known cutoff; all that is needed is a change in the intensity of treatment. That is, RKD exploits a change in the relationship between the running variable (e.g., income) and the treatment variable (e.g., loan size) around known values in the running variable (e.g., the income cutoffs at which the relationship between loan size and income changes). As such, whereas RDD focuses on differences

121. SCOTT CUNNINGHAM, CAUSAL INFERENCE: THE MIXTAPE 242-43 (2021), https://mixtape.scunning.com/06-regression_discontinuity [https://perma.cc/ZHK4-A59U].

122. *Id.* at 247-48. Minimum admissions scores for schools are a common example. Imagine a school has a minimum SAT score of 1250 for enrollment. This means a student with a 1249 would not be offered admission even though a student with a 1250 would (all else being equal). In this scenario, the score of 1250 is the "cutoff." If one assumes students that receive 1249s and students that receive 1250s (or some scores in a reasonable "bandwidth" around the 1250 cutoff) are comparable in all other relevant respects, then the RDD can be utilized to determine the effect of treatment (i.e., school enrollment) on some other observable outcome of interest, like wages. In this example, the treated students (i.e., those with SAT scores just above the cutoff) are compared against untreated students (i.e., those with SAT scores just below the cutoff). *See id.* 246-51.

123. One could imagine an alternative lending rule where different income bins are eligible for different size loans. For example, imagine a rule where loans were only available as 10% of annual income rounded to the nearest $50. *Cf.* Dobbie & Skiba, *supra* note 93, at 260 ("[L]oans are offered in $50 increments that are no larger than half of a borrower's biweekly pay. Thus, loan eligibility increases discontinuously by $50 at each $100 pay interval. Stores using this rule form our regression discontinuity sample.").

in the intercepts of the functions relating the treatment variable and the running variable on either side of the cutoff, the RKD focuses on the difference in the slopes of these functions on either side of the kink.[124]

For clarity, consider the separable model[125]

$$Y = y(L, I, U) = \tau L + gI + U,$$

where Y is the outcome of interest, L is the variable of interest (e.g., loan size), I is the running variable (e.g., annual income), and U is an unobserved covariate. If L is a function of the other observable characteristic I with a kink in the slope of that function, as in the piecewise function

$$L = \ell(I, \varepsilon) = \begin{cases} \rho_1 I + \varepsilon \; if \; I \leq i_0 \\ \rho_2 I + \varepsilon \; if \; I > i_0 \end{cases},$$

then the endogenous determination of L means the estimated effect of L cannot be separated from the effect of I through a simple ordinary least squares (OLS) regression. The error term ε represents the fact that the relationship between income and loan size is not deterministic but is instead subject to some randomness.[126]

Although OLS regression methods cannot overcome this endogeneity concern and would produce biased estimates for the coefficients τ and g, these coefficients can be separably estimated using the RKD by exploiting the change in slope that occurs in the piecewise function $\ell(I, \varepsilon)$ at the kink point $I = i_0$. Since the running variable (i.e., annual income) is smooth across i_0, income cannot induce a kink in the conditional expectation function $y(L, I, U|i)$. But if there is a causal relationship between income and the outcome of interest Y, then any change in slope in $y(L, I, U|i)$ that we observe when $i = i_0$ can, in the limit, be attributed to the change in loan size rather than a change in income.

In the case of online payday loans, we observe this type of change in slope in the relationship between income and loan size because of the institutional features of online payday lending at Company and in Tennessee. Figure 1 is a representation of these institutional and statutory rules, demonstrating their piecewise nature analogous to the that described by $\ell(I, \varepsilon)$ above. Annual income is on the x-axis (the running variable) and

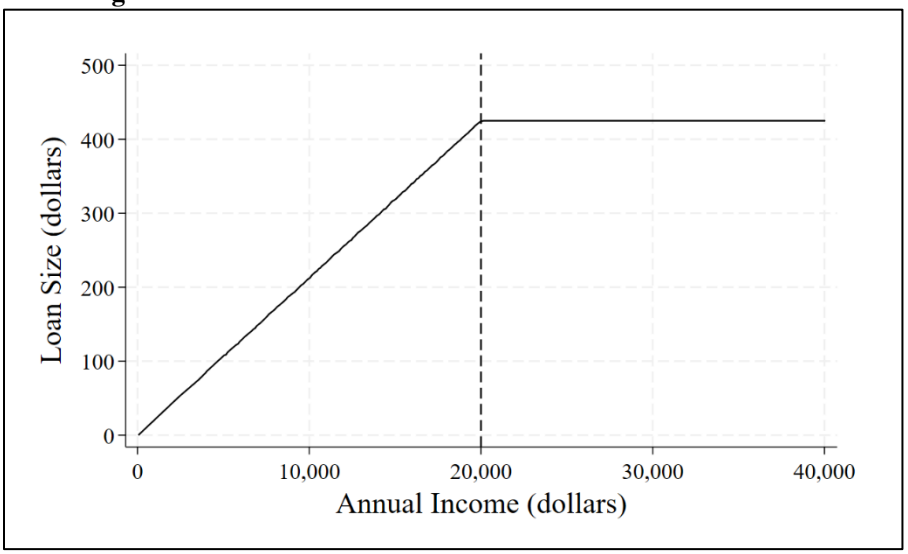
124. CUNNINGHAM, *supra* note 121, at 312-13; David McKenzie, *Tools of the Trade: The Regression Kink Design*, WORLD BANK BLOGS (Feb. 8, 2016), https://blogs.worldbank.org/en/impactevaluations/tools-trade-regression-kink-design [https://perma.cc/4B4F-XUGR]; *see also* Camille Landais, *Assessing the Welfare Effects of Unemployment Benefits Using the Regression Kink Design*, 7 AM. ECON. J.: ECON. POL'Y 243, 255-57 (2015) (applying the RKD to understand how labor supply responds to unemployment insurance).

125. The results hold under a more generalized nonseparable model as well, but we present the linear separable model for simplicity. *See* David Card, David S. Lee, Zhuan Pei & Andrea Weber, *Inference on Causal Effects in a Generalized Regression Kink Design*, 83 ECONOMETRICA 2453, 2455-59 (2015) (examining the nonseparable model).

126. For more detailed derivation of the separable model, see Helena Skyt Nielsen, Torben Sørensen & Christopher Taber, *Estimating the Effect of Student Aid on College Employment: Evidence from a Government Grant Policy Reform*, 2 AM. ECON. J.: ECON. POL'Y 185 (2010).

the size of Company's loan offer is on the *y*-axis (the treatment variable). As described above, it is Company's policy to cap loans at 25.5 percent of a customer's monthly income. Simultaneously, state law in Tennessee caps loans at $500 independent of the borrower's income, which lead to $425 maximum payments after applicable fees. Although these rules operate concurrently, only one rule is ever binding on Company and Company's customers—whichever is stricter for the given income level. For borrowers who make less than $20,000 per year, Company's 25.5 percent cap is binding.[127] By contrast, for borrowers who make more than $20,000 per year, the state's $500 cap is binding and an increase in annual income does not translate into a higher loan offer. Even though these piecewise loan rules apply to loan *offers*, an analogous kink is still expected in actual loan size. Even though not all borrowers take the maximum loan they are offered, borrowers are still influenced by the offer they receive.[128]

Figure 1: Kinked Loan-Offer Curve over Annual Income[129]



127. The kink point of i_0=$20,000 is the income, i_0, where $0.255i_0$=$425.

128. *Cf.* Amos Tversky & Daniel Kahneman, *Judgment Under Uncertainty: Heuristics and Biases*, 185 SCI. 1124, 1128 (1974) ("In many situations, people make estimates by starting from an initial value that is adjusted to yield the final answer. . . . That is, different starting points yield different estimates, which are biased toward the initial values. We call this phenomenon anchoring."); Adrian Furnham & Hua Chu Boo, *A Literature Review of the Anchoring Effect*, 40 J. SOCIO-ECON. 35 (2011) (reviewing literature demonstrating the anchoring effect). This influence is demonstrated empirically in Figures 2 and 3. Figure 2 shows the relationship between loan size and annual income for all borrowers, and Figure 3 demonstrates the same for the group of borrowers with the maximum loan size for their respective annual income level. Both produce distinct kinks around the $20,000 kink point as predicted by the offer rules.

129. The solid black line represents the maximum possible loan offer consistent with Company's rules and Tennessee law (after accounting for fees). The kink point is represented by the dashed black line at $20,000 of annual income, where the binding loan-offer rule changes.

To understand the effect of the kink on the ultimate outcomes of interest, we must estimate the size of the kink itself. To do this, we first run local linear regressions of loan size on annual income's distance from the kink and an interaction between this distance and a dichotomous variable equal to one if the borrower's annual income is above the $20,000 kink point. The coefficient on the interaction term is the estimate of the size of the kink relating annual income and loan size.

In the second stage, to estimate the effect of capping loan size on the financial outcomes of interest, we run local linear regressions to estimate the size of the kink in the conditional expectation function for the particular outcome at the kink point. We then divide the estimate of the change in slope in the conditional expectation function from the second stage by the estimate of the size of the kink found in the first stage to reveal the causal effect of loan size on our outcomes of interest. In practice, this scaling is carried out through instrumental variables regression where the interaction of annual income's distance from the kink and the dichotomous variable indicating income above $20,000 is instrumented for loan size.

In layman's terms, we estimate what would have happened to a borrower with income greater than $20,000 had she not been affected by the state's loan size cap and was instead bound only by Company's internal lending rule while accounting for any potentially countervailing effects of the borrower's income. In doing so, we estimate a counterfactual world where the state cap does not exist. With this counterfactual in hand, we can estimate the causal effect of the state cap because we can compare how borrowers were affected by the cap (using data we actually observe) to how they would have fared without the cap (which we estimate using the econometric processes detailed above).

The assumptions underlying the internal validity of the RKD estimates are analogous to those needed in a conventional RDD. The central identifying assumption, necessary to give our results a causal interpretation, is that borrowers on one side of the kink are a good counterfactual for borrowers on the other side. In other words, the kink point must be exogenous to other factors and characteristics that might affect the outcomes of interest, and borrowers must not be able to perfectly manipulate their annual income to position themselves on their chosen side of the kink. For example, it would be problematic if the loan-offer curve changes at $20,000 *and* financial literacy changes materially when income exceeds $20,000.

To satisfy this assumption, we must first select a sufficiently narrow range or "bandwidth" around the kink so that we can plausibly infer that borrowers on either side of the kink and within the relevant bandwidth are, on average, statistically indistinguishable from one another aside from the fact that they fall on one side of the cutoff or the other. The smaller the bandwidth, the easier this argument is to make. However, RKD (and RDD generally) is a data intensive empirical strategy that sometimes necessitates

expanding the bandwidth to increase the number of observations available. We balance this tradeoff by selecting the smallest bandwidth that still produces stable and precise results; the process for selecting the bandwidth is discussed more fully in the section on robustness checks below.

C. Results

1. Capital-Constrained Borrowers

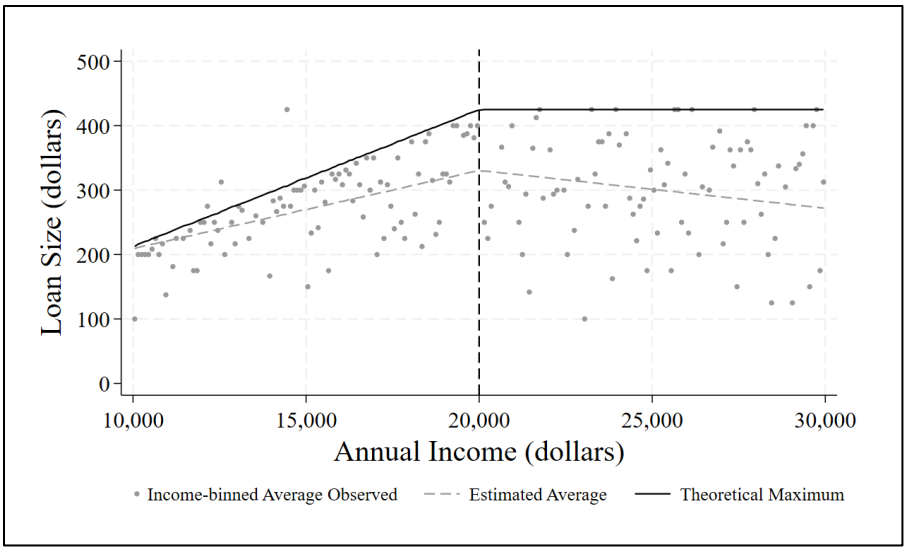
We first analyze first-time borrowers at Company with annual income between $10,000 and $30,000 who are paid monthly, semimonthly, or biweekly, representing a $10,000 bandwidth.[130] As hypothesized, borrowers are strongly influenced by the size of the loan they are offered. In Figure 2, each dot represents the average loan size for a given annual income, where annual income is grouped into $100 bins. The dashed gray line is the predicted loan size based on a local linear regression of loan size on annual income.

Figure 2 demonstrates that, although not all customers borrow the full amount they are offered, they are affected by the change in the slope of the loan offer curve. There is a positive relationship between annual income and loan size below $20,000, where a higher income results in a higher loan offer. At incomes above $20,000, however, where a higher income still results in a loan offer of $425, there is a negative relationship between income and amount borrowed, suggesting that as income increases, demand for borrowing on online payday loans decreases, potentially because these higher-income borrowers have access to alternative credit sources.

Figure 2: Kinked Actual Loan Size over Annual Income[131]

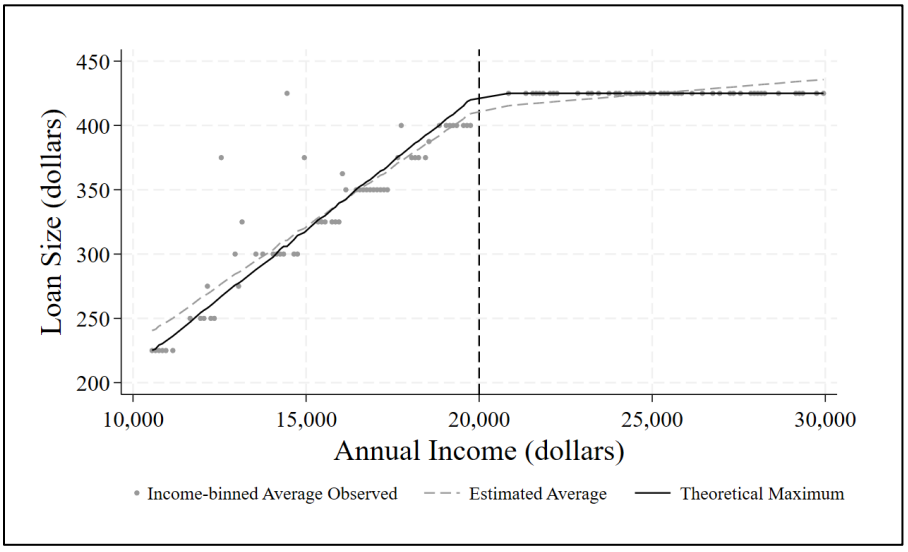
130. While this bandwidth may seem large, robustness checks in the following Section show that covariates are largely balanced across the full range of incomes analyzed and that our primary estimates of interest are largely stable for smaller bandwidths up to the $10,000 bandwidth chosen. *See infra* Figures 6, 7.

131. Each dot represents the average loan size for annual income binned into $100 intervals. The solid black line represents the maximum possible loan offer consistent with Company's rules and Tennessee law (after accounting for fees). The dashed gray line is the estimated actual loan size based on a local linear regression of loan size on annual income. The kink point is represented by the dashed black line at $20,000 of annual income, where the binding loan-offer rule changes. Observations include all first-time online payday loan users who are paid monthly, semimonthly, or biweekly and earn between $10,000 and $30,000 annually.



By carrying out additional analysis with only borrowers who take the maximum loan available, what we call "maximum borrowers" (defined as borrowing at least 95 percent of the maximum permissible loan offer), we can create a sample that closely follows the maximum offer curve, as shown in Figure 3.

Figure 3: Kinked Actual Loan Size over Annual Income for Maximum Borrowers[132]



Although the loan size rules are presumptively binding, there is noticeable slippage in the first stage. Since some data do not perfectly accord with the relevant decision rule (the loan size restrictions here), the RKD is more accurately characterized as a "fuzzy" RKD. This suggests that Company's 25.5 percent lending rule is not strictly followed; however, the absence of loans above $425 across all income levels suggests that Company abides by the state loan cap. It is not clear why some borrowers received a loan larger than we expected based on our understanding of Company's lending rules, but error or employee discretion could be to blame. Since these instances are relatively rare, they should have a minimal effect on the second stage results.

Regressions underlying Figure 2 reveal that the proportion of any increase in annual income that the customer chooses to borrow is 0.01215—or $12.15 for every $1,000 of additional annual income. Recall that Company allows borrowers that are paid monthly, semimonthly, and biweekly to obtain an online payday loan of up to 25.5 percent of their monthly income. For a borrower paid monthly, for example, a $1,000 increase in annual income represents an $83.33 increase in monthly income. Under

132. Each dot represents the average loan size for annual income binned into $100 intervals. The solid black line represents the maximum possible loan offer consistent with Company's rules and Tennessee law (after accounting for fees). The dashed gray line is the estimated actual loan size based on a local linear regression of loan size on annual income. The kink point is represented by the dashed black line at $20,000 of annual income, where the binding loan-offer rule changes. Observations include all first-time online payday loan users who are paid monthly, semimonthly, or biweekly, earn between $10,000 and $30,000 annually, and borrow at least 95 percent of the maximum loan available (i.e., "maximum borrowers").

Company's lending rule, for every $1,000 of annual income, the customer can borrow an additional $21.25.[133] Putting these results together, the kink indicates that on average customers would borrow 57 percent of every additional dollar offered.[134]

These results suggest that online borrowers are severely credit constrained, and even more so than previous studies documenting credit constraints among other low-income consumers have estimated. Dobbie and Skiba show that storefront payday borrowers take about 42 cents of every additional dollar offered.[135] Kathryn Fritzdixon similarly finds a 54 percent increase in borrowing for every additional dollar of auto-title credit offered.[136] In credit card markets, too, this marginal propensity to consume has been estimated to be around 0.5 among borrowers whose credit lines were close to maxed out.[137]

2. Long-Term Financial Effects

Since marginal regulation would focus on promoting efficient use of payday loans and preventing borrowers from falling into a cycle of debt, our second stage results focus on future total indebtedness and repayment behavior. These include the total number of loans taken from Company in the next 12 months; total dollar value of those loans; delinquency of 30 days or longer; and default. As with the first stage, we restrict our analysis to borrowers paid monthly, semimonthly, or biweekly with annual incomes between $10,000 and $30,000 who are taking out an online payday loan for the first time at Company. From this pool we analyze two samples: all borrowers fitting those exclusion criteria, and all maximum borrowers fitting those exclusion criteria. By analyzing maximum borrowers, we can better assess the effects of the loan caps on those that are most likely facing credit constraints.

The graphical results in Figure 4 reveal that constraints on how much a consumer can borrow leads to additional borrowing on any type of subprime credit offered by Company in the next six months to a year, as indicated by the increased slope on the right side of the $20,000 kink (where the state loan cap is binding) in panels C and D. Figure 5 shows results for maximum borrowers, with a similar set of slope increases right of the kink point in panels B, C, and D.

133. Mathematically this result is derived as follows: 0.255×$83.33=$21.25.

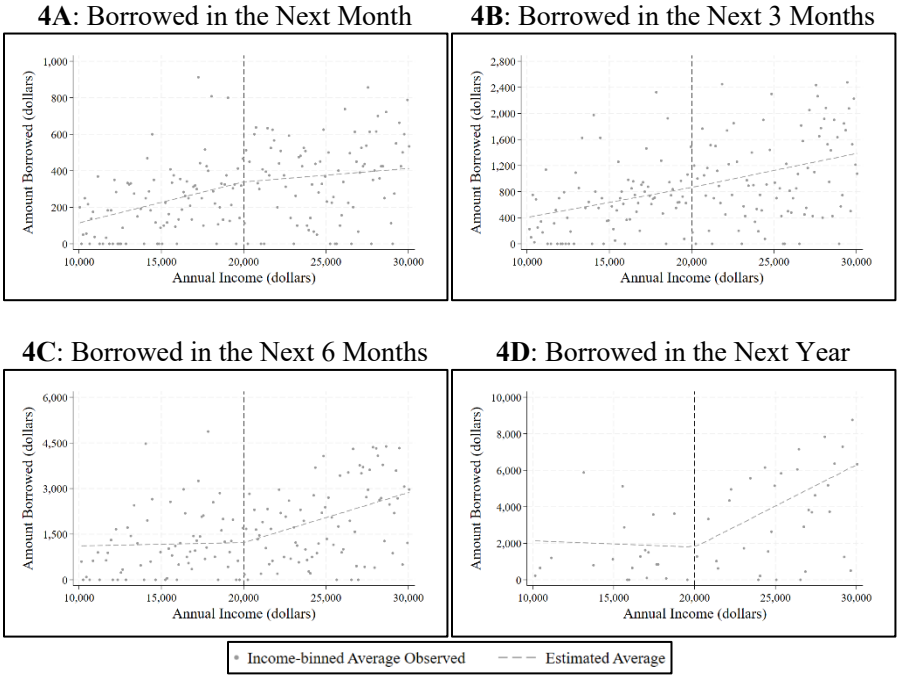
134. Mathematically this result is derived as follows: $12.15÷$21.25=0.57.

135. Dobbie & Skiba, *supra* note 93, at 257.

136. Kathryn Fritzdixon, Essays on Consumer Finance: Topics in Auto Title Lending 17 (May 2015) (Ph.D. Dissertation, Vanderbilt University), https://irbe.library.vanderbilt.edu/server/api/core/bitstreams/4e1d2a39-689b-46fb-b0f1-fe10f19a8c9a/content [https://perma.cc/2HXN-R9D7].

137. David B. Gross & Nicholas S. Souleles, *Do Liquidity Constraints and Interest Rates Matter for Consumer Behavior? Evidence from Credit Card Data*, 117 Q.J. ECON. 149, 173 (2002).

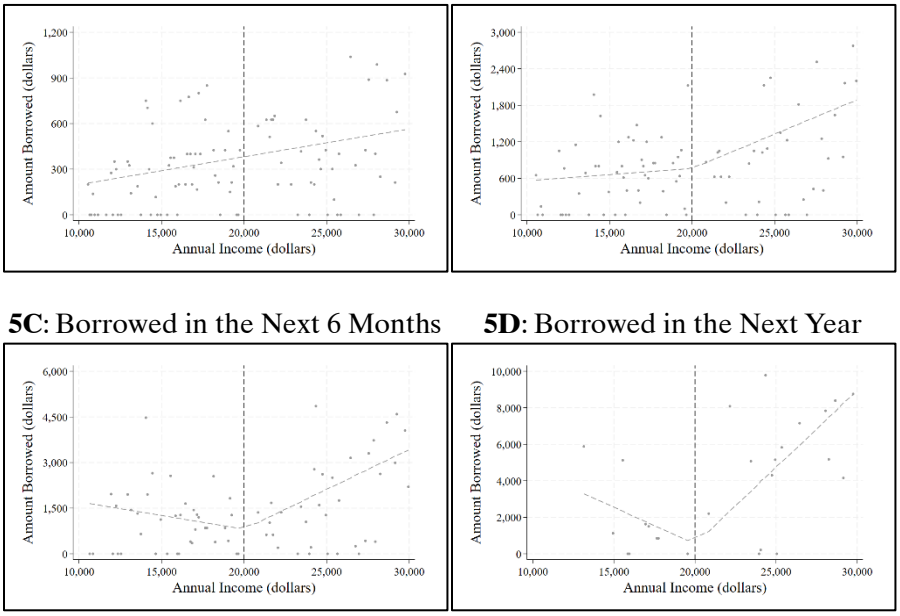
Figure 4: Total Amount Borrowed over Different Time Horizons for All Borrowers [138]



138. Each dot represents the average loan size for annual income binned into $100 intervals. The dashed gray line is the estimated actual loan size based on a local linear regression of loan size on annual income. The kink point is represented by the dashed black line at $20,000 of annual income, where the binding loan-offer rule changes. The vertical axis (Amount Borrowed) represents the total amount borrower from Company using any type of subprime loan available one month (Panel A), three months (Panel B), six months (Panel C), or twelve months (Panel D) after the origination of the borrower's first online payday loan. Observations include all first-time online payday loan users who are paid monthly, semimonthly, or biweekly, and earn between $10,000 and $30,000 annually.

Figure 5: Total Amount Borrowed over Different Time Horizons for Maximum Borrowers [139]

5A: Borrowed in the Next Month **5B**: Borrowed in the Next 3 Months



5C: Borrowed in the Next 6 Months **5D**: Borrowed in the Next Year

The visual results of Figures 4 and 5 are largely confirmed by regression results, shown in Table 2 (for all borrowers and maximum borrowers). Table 2 displays the effect of a $1 increase in loan size on the size of subsequent loans (covering all types of loans at Company). As shown in Table 2, we find that a borrower prohibited from borrowing an extra $50 today takes out $615 more at Company in the next 6 months on any type of loan.[140] This result is statistically significant at the 10% level.

Maximum borrowers follow a similar, but starker, path. As expected, the effects on this class of borrowers—those who are most likely to be credit constrained—are much larger than for all borrowers. As shown in Table 2, we find that for maximum borrowers, being prohibited from

139. Each dot represents the average loan size for annual income binned into $100 intervals. The dashed gray line is the estimated actual loan size based on a local linear regression of loan size on annual income. The kink point is represented by the dashed black line at $20,000 of annual income, where the binding loan-offer rule changes. The vertical axis (Amount Borrowed) represents the total amount borrowed from Company using any type of subprime loan available one month (Panel A), three months (Panel B), six months (Panel C), or twelve months (Panel D) after the origination of the borrower's first online payday loan. Observations include all first-time online payday loan users who are paid monthly, semimonthly, or biweekly, earn between $10,000 and $30,000 annually, and borrow at least 95 percent of the maximum loan available (i.e., "maximum borrowers").

140. Mathematically this result is derived as follows: 12.29×$50=$614.50.

borrowing an extra $50 today leads the borrower to take out $1,145 more on any type of loan at Company in the next 6 months.[141] This result is statistically significant at the 10% level. We similarly find statistically significant increases in the total number of loans for all borrowers (in the next six months) and maximum borrowers (in the next three months and the next six months).

Table 2: Effect of Loan Size on Subsequent Borrowing for All Borrowers and Maximum Borrowers[142]

Outcome	All Borrowers	Maximum Borrowers
Amount borrowed (dollars)		
In next month	1.39	-0.60
	(0.88)	(1.87)
In next 3 months	-2.08	-8.26
	(2.67)	(6.54)
In next 6 months	-12.29*	-22.89*
	(6.37)	(12.23)
In next year	27.92	-97.36
	(23.14)	(115.50)
New loans taken out		
In next month	0.004	-0.003
	(0.003)	(0.004)
In next 3 months	-0.006	-0.024**
	(0.007)	(0.012)
In next 6 months	-0.030**	-0.067**
	(0.015)	(0.027)
In next year	0.050	-0.189
	(0.049)	(0.196)

Table 3 shows the effect of the loan size cap on default, rollovers, late payment, and delinquency.[143] The results for default are negative and significant at the 10% level for all borrowers and negative and significant at

141. Mathematically this result is derived as follows: 22.89×$50=$1,144.50.

142. "All borrowers" includes all first-time online payday loan users who are paid monthly, semimonthly, or biweekly, and earn between $10,000 and $30,000 annually. Maximum borrowers are those who borrow at least 95 percent of the maximum loan available. Each cell represents a unique regression, reporting the marginal effect of an increase in loan size around the kink point. Robust standard errors are reported in parentheses. Outcomes measure total subsequent debt acquired or loans taken out using any subprime credit product offered by Company over the stated time horizon. *** p<0.01, ** p<0.05, * p<0.10.

143. In figures not shown, the slope increase in the local linear regression right of the kink described for several panels in Figures 4 and 5 are also apparent for default rates (all borrowers and maximum borrowers) and rollovers (all borrowers and maximum borrowers), but the slope increases are small and/or may be driven by a few outliers, especially the increased slopes observed for rollovers.

the 5% level for maximum borrowers. This suggests that receiving a larger loan may alleviate trouble repaying the initial loan. Among all borrowers, restrictions on receiving a $50 larger loan today increases the probability of defaulting on the loan by 0.035 percentage points.[144] Among maximum borrowers, the increase is 0.075 percentage points.[145] Since the average default rate is 2.3 percent, however, these effects are not economically large, representing only a 1.5 percent increase in the mean for all borrowers and a 3.3 percent increase in the mean for maximum borrowers. For maximum borrowers, the cap also increases rollovers by an economically small but statistically significant amount.

Table 3: Effect of Loan Size on Subsequent Repayment Behavior for All Borrowers and Maximum Borrowers [146]

Variable	All Borrowers	Maximum Borrowers
Default	-0.0007*	-0.0015**
	(0.0004)	(0.0006)
Number of rollovers	-0.0002	-0.0039*
	(0.0011)	(0.0020)
Paid late	0.0033	0.0022
	(0.0011)	(0.0020)
Delinquent 15 days or more	-0.0010	0.0003
	(0.0010)	(0.0019)
Delinquent 30 days or more	-0.0007	0.0000
	(0.0009)	(0.0018)
Delinquent 60 days or more	-0.0007	-0.0002
	(0.0009)	(0.0017)

D. Robustness Checks

To further strengthen our results, we perform a series of robustness checks to test the validity of the assumptions underlying the RKD. As discussed above, the critical assumptions for an RKD are that (1) borrowers just to the right of the kink are similar on all relevant attributes to borrowers just to the left of the kink, and that (2) borrowers should not be able to perfectly assign themselves to one side of the kink point. If the first

144. Mathematically this result is derived as follows: 0.0007×50=0.035.

145. Mathematically this result is derived as follows: 0.0015×50=0.075.

146. "All borrowers" includes all first-time online payday loan users who are paid monthly, semimonthly, or biweekly, and earn between $10,000 and $30,000 annually. Maximum borrowers are those who borrow at least 95 percent of the maximum loan available. Each cell represents a unique regression, reporting the marginal effect of an increase in loan size around the kink point to see if borrowers' personal or loan characteristics change around that point. Robust standard errors are reported in parentheses. Outcomes measure default (dichotomous), rollovers, late payment (dichotomous), and delinquency over several time horizons. *** p<0.01, ** p<0.05, * p<0.10.

assumption fails—for example, if borrowers differ systematically on either side of the kink—then we may be estimating the effect of those differences instead of the effect of loan size. If the second assumption fails—for example, if borrowers can decide which side of the kink to fall on—then selection bias may be introduced because borrowers' assignment into treatment (i.e., falling to the right of the kink) is no longer quasi-random.

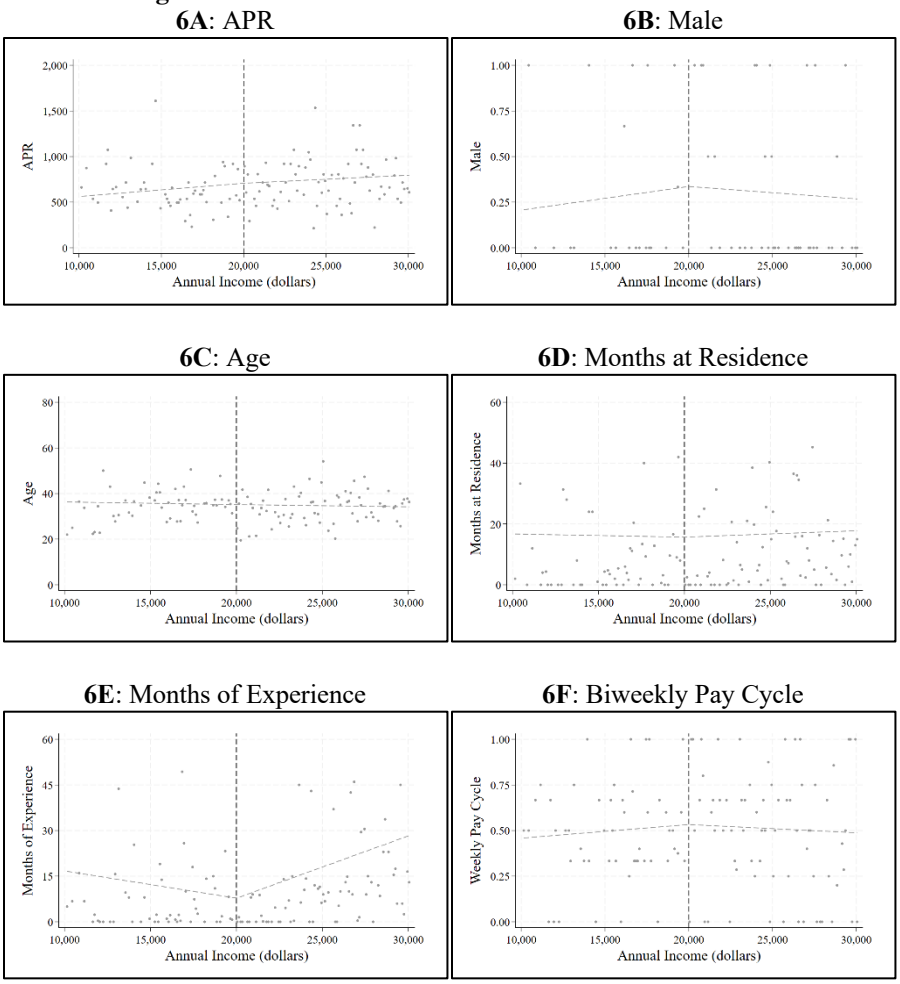
To assess the first assumption, we plot densities of observable covariates available in our dataset and test whether borrower or loan characteristics experience a trend break at the kink aside from the kink in loan size identified above. These covariates include APR, sex, age, months living at current residence, months of experience at current job, and pay cycle. Formal regression results for these tests are shown in Table 4, and the corresponding graphical results for all borrowers are shown in Figure 6. As shown in Table 4, the only statistically significant covariates are APR and semimonthly pay cycle for maximum borrowers, which suggests some results for this group may be attributable at least in part to these factors changing at the kink point.[147] Graphically, only small changes in slope are observable across the kink point for most characteristics tested.

Table 4: Testing Discontinuity of Covariates at the Kink Point[148]

Variable	All Borrowers	Maximum Borrowers
APR	0.0028	0.0442*
	(0.0175)	(0.0261)
Male	0.0000	0.00001
	(0.0000)	(0.0001)
Age	0.512	-0.380
	(0.558)	(0.329)
Months at residence	0.0002	0.0017
	(0.0018)	(0.0026)
Months of experience	0.0030	0.0014
	(0.0028)	(0.0018)
Biweekly pay cycle	0.0000	-0.0001
	(0.0000)	(0.0000)
Semimonthly pay cycle	-0.0000	0.0001***
	(0.0000)	(0.0000)
Monthly pay cycle	0.00002	0.0000
	(0.00002)	(0.0000)

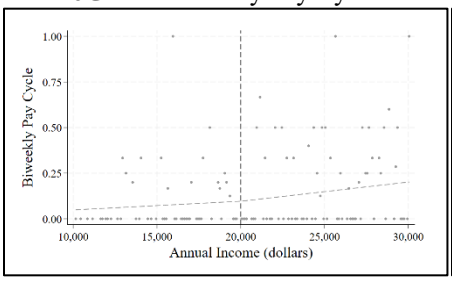
148. Observations include all first-time online payday loan users who are paid monthly, semimonthly, or biweekly, and earn between $10,000 and $30,000 annually. The last column is further restricted to those who borrow at least 95 percent of the maximum loan available (i.e., "maximum borrowers"). Each cell represents a unique regression. Outcomes measure loan APR as well as borrower sex, age, months in current residence, month of experience at current job, and pay period type. *** p<0.01, ** p<0.05, * p<0.10.

Figure 6: Distribution of Covariates Around Kink[149]

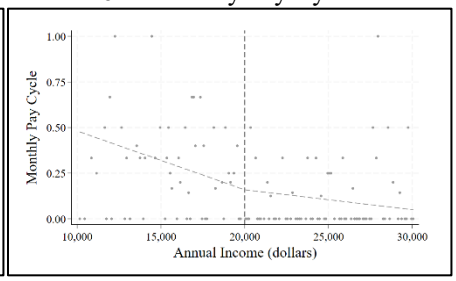


149. Each dot represents the average loan size for annual income binned into $100 intervals. The dashed gray line is the estimated actual outcome variable measure based on a local linear regression of the relevant outcome on annual income. The kink point is represented by the dashed black line at $20,000 of annual income, where the binding loan-offer rule changes. The vertical axis measures loan APR (Panel A), borrower's sex (Panel B), borrower's age (Panel C), borrower's months living at her current residence (Panel D), borrower's months of experience working at her current job (Panel E), and borrower's pay period type (biweekly in Panel F; semimonthly in Panel G; and monthly in Panel H). Observations include all first-time online payday loan users who are paid monthly, semimonthly, or biweekly, and earn between $10,000 and $30,000 annually.

6G: Semimonthly Pay Cycle



6H: Monthly Pay Cycle



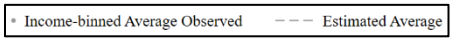
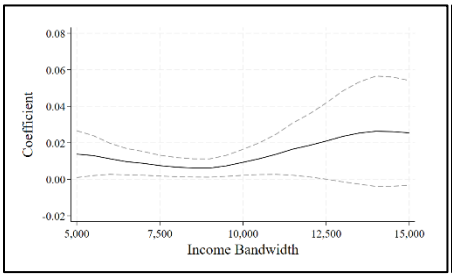
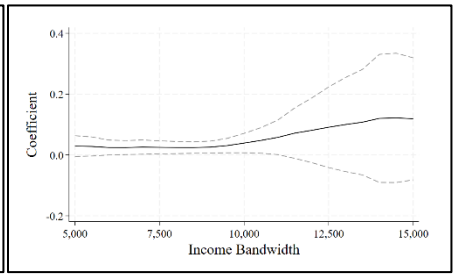


Figure 7: Results' Sensitivity to the Choice of Bandwidth[150]

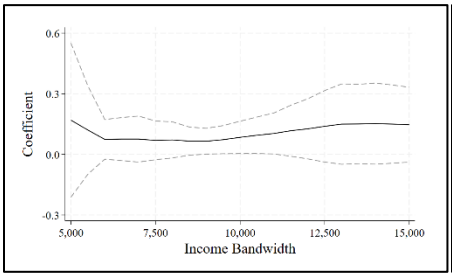
7A: Loans in 1 Month



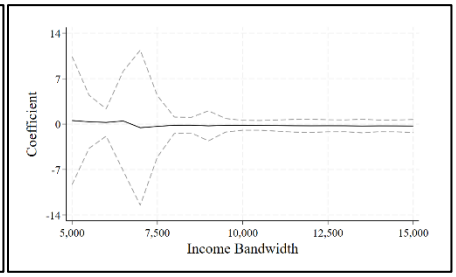
7B: Loans in 3 Months



7C: Loans in 6 Months

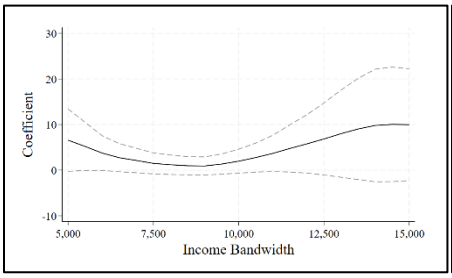


7D: Loans in 12 Months

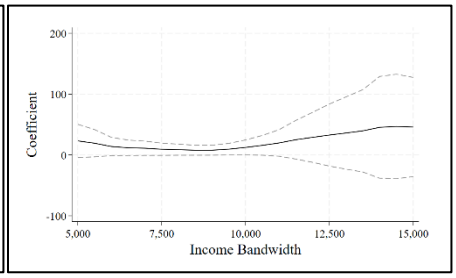


150. The gray dashed lines show 95 percent confidence intervals for the stated regression coefficients, which are plotted by the black line, as a function of bandwidth. The vertical axis measures the second stage regression coefficient where the outcome of interest is loans taken out in the following month (Panel A), three months (Panel B), six months (Panel C), or 12 months (Panel D); money borrowed in the following month (Panel E), three months (Panel F), six months (Panel G), or 12 months (Panel H); default (Panel I); late payment (Panel J); delinquency of at least thirty days (Panel K); and rollovers (Panel L). Observations include all first-time online payday loan users who are paid monthly, semimonthly, or biweekly, and earn between $10,000 and $30,000 annually.

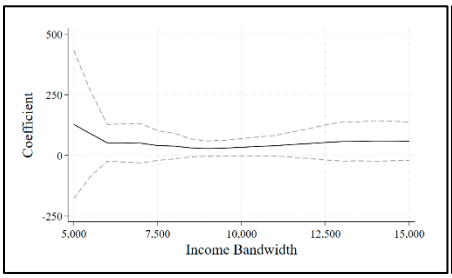
7E: Borrowed in 1 Month



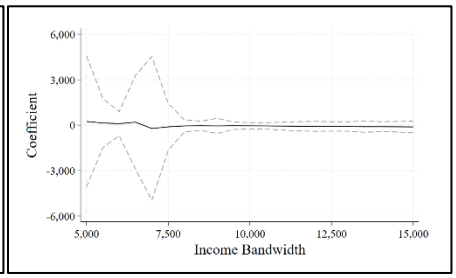
7F: Borrowed in 3 Months



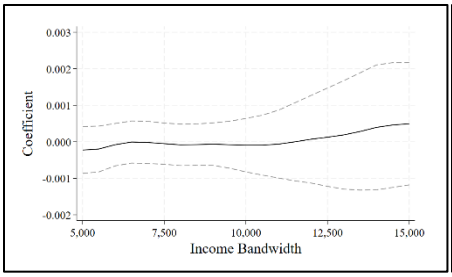
7G: Borrowed in 6 Months



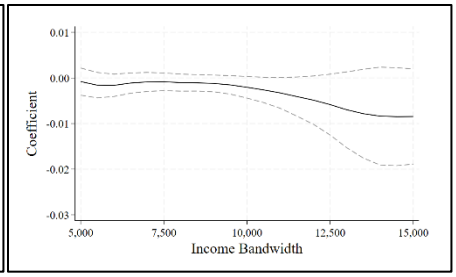
7H: Borrowed in 12 Months



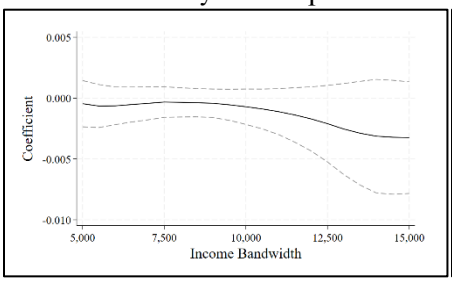
7I: Default



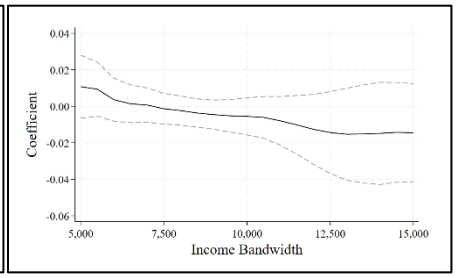
7J: Paid Late

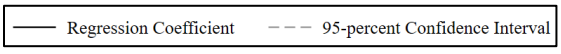


7K: 30 Days Delinquent



7L: Loan Rollovers





The RKD procedure also involves setting the size of the bandwidth around the kink to be analyzed—here, the range of income levels to focus

our analysis on. The bandwidth choice is important because as you move away from the kink point, there is heightened concern that the observations on either side are not quality counterfactuals for one another. For example, there are likely greater observable and unobservable differences between borrowers making $15,000 and $25,000 annually than between borrowers making $19,500 and $20,500 annually. To address this concern, we test the sensitivity of our results to this bandwidth choice, and Figure 7 shows the results of these tests. The dashed gray lines show 95 percent confidence intervals for the regression coefficients, which are plotted by the solid black line for various bandwidths. For bandwidths smaller than the $10,000 bandwidth used in the analysis above, estimates are generally stable.[151] The relatively smaller confidence intervals using the $10,000 bandwidth coupled with these steady regression coefficient estimates motivated our choice of the $10,000 bandwidth because it enabled stable *and* precise estimates of the treatment effects being sought.

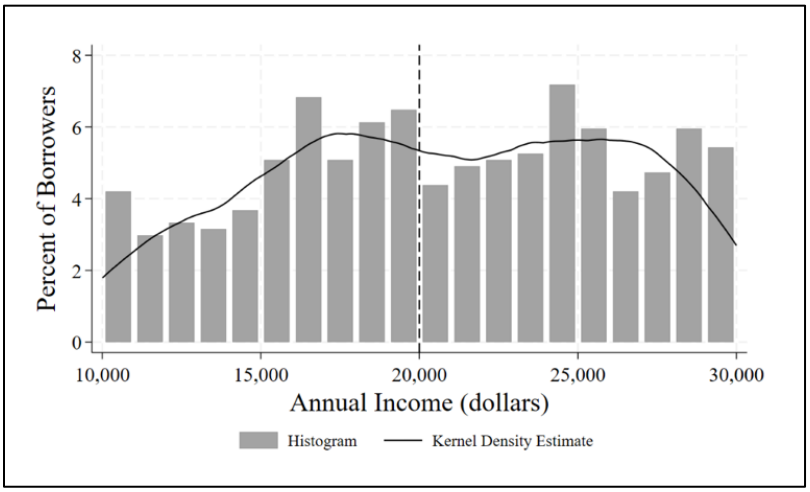
To examine the extent to which borrowers manipulate their income to fall on one side of the cutoff, RKD's second major assumption, we test for bunching of borrowers around the kink at $20,000 of annual income. Again, we focus on borrowers taking out an online payday loan for the first time at Company whose annual income is between $10,000 and $30,000. Motivated by McCrary's test for regression discontinuity designs,[152] we test whether the density of borrowers varies smoothly across the $20,000 annual income cutoff. If one side of the cutoff were preferable to the other and borrowers could sort themselves onto that side, we would expect to see significantly more borrowers fall just above (or below) the kink point.

Figure 8: Distribution of Annual Income Around the Kink[153]

151. Importantly, this is true for the estimates of subsequent borrowing in the following six months and default, the outcomes that underly our most significant results.

152. *See* Justin McCrary, *Manipulation of the Running Variable in the Regression Discontinuity Design: A Density Test*, 142 J. ECONOMETRICS 698 (2008).

153. The gray bars show the percentage of borrowers in the sample in a histogram with $1,000 bins. The solid black line shows the estimated kernel density as a function of income, which represents a continuous generalization of the histogram similar to a probability density function. The kink point is represented by the dashed black line at $20,000 of annual income, where the binding loan-offer rule changes. Observations include all first-time online payday loan users who are paid monthly, semimonthly, or biweekly, and earn between $10,000 and $30,000 annually.



This does not appear to be the case, as shown graphically in Figure 8. Consistent with the assumption that borrowers are not sorting into treatment, we do not observe bunching near the kink point. Furthermore, in our setting, we worry less about this so-called manipulation of the running variable because unlike in traditional RDDs, movement from one side of the kink point to the other does not dramatically affect a borrower's loan offer. Moving just to the right of the kink point is associated with no increase in the loan offer's size. Moving just to the left reduces the maximum offer, but a higher-income borrower who falls to the right of the kink point could just choose to borrow less than offered, rather than manipulate the loan offer through their reported income.

As a final robustness test, rather than using the $20,000 kink point that Company's lending rule and state law suggest is relevant, we run placebo-test regressions with arbitrarily chosen income thresholds (i.e., pseudo-kinks) and show that the credit-constraint and default-rate results do not hold for these arbitrarily chosen kinks. If there were an underlying curved relationship between income and future borrowing or default, then we may be capturing that relationship rather than a trend break with our estimates at the real cutoff. In results from our placebo-test regressions that are available upon request, however, we show that this does not appear to be the case.

III. Regulation on the Margin: Implications for Policymakers

Using data from a payday lender in Tennessee, this study estimates the effects of loan caps in online payday lending on future borrowing and repayment behavior. First, the analysis confirms that online payday borrowers are highly credit constrained. There is a need among consumers in the fringe economy for access to credit. Second, the analysis estimates the

effects of Tennessee's payday loan cap on borrowers' ability to repay their debts and subsequent borrowing, revealing that the marginal borrower subject to the state loan cap increases their future indebtedness with no economically significant effect on defaults and no statistically significant effect on late payments or delinquency. Together, the results suggest that for low-income, credit-constrained borrowers, a larger loan may help alleviate credit problems, at least at the small loan size of $500.

These results suggest that states that have low-dollar caps on payday loans should consider raising them, especially as inflation continues to increase the cost of living. However, at some point, these loans could veer away from traditional payday lending to resemble something more akin to installment loans, especially if the increased cap is permitted only if repayment windows are extended likewise. As scrutiny of payday lenders has grown over the last several decades, installment loans have become increasingly popular among subprime borrowers, with many payday lenders even venturing into this market—including the Tennessee lender at the center of this study.

Installment loans differ from payday loans in that they tend to be for larger sums and have longer repayment periods.[154] These attributes suggest installment loans can be less risky alternatives to payday loans; however, while their financing costs are significantly lower than with payday loans, their APR still reaches triple digits.[155] Since installment loans are a large-dollar analog to payday loans, research on their effects could shed light on the effects of marginal increases in the size of payday loan caps. Prior research by Carlie Malone and Skiba, however, demonstrates the continuing uncertainty surrounding installment loans. Using data from the same Tennessee firm at the center of this study, Malone and Skiba examine the effects of installment loans on future indebtedness and default, finding that larger installment loans lead to increased future indebtedness and nonsignificant increases in default.[156] As Malone and Skiba note, the consumer-welfare implications of these results are unclear. They might be a sign that installment loans are viewed as a sustainable, long-term credit solution for these borrowers, but the results may also signal difficulty repaying installment loans, potentially trapping borrowers in a cycle of debt—a criticism frequently leveled against payday loans.[157]

The same rationale may explain the results seen here with online payday loans, with implications for how policymakers can regulate at the margin. Here, online payday borrowers experience increased indebtedness as a result of the loan cap, with minimal effects on repayment. This might be

154. Malone & Skiba, *supra* note 3, at 313.

155. *Id.*

156. Carlie Malone & Paige Marta Skiba, *Installment Loans*, 53 J. LEGAL STUD. 369, 379 (2024). The pair is able to rule out large increases in default; with 95 percent confidence, they rule out an increase in defaults greater than 7 percent. *Id.*

157. *Id.* at 380.

a result of borrowers' use of payday loans as a sustainable form of credit, or a combination of borrowers' credit constraints and the inability of smaller loans to satisfy their liquidity needs.

Taking these results together may generate more questions than answers. Most notably for our purposes, how should policymakers regulate payday lending? Although there is no obvious answer to this question, even in light of the new evidence we present here, the limited federal regulation in this space leaves states free to act as laboratories, as they have in the past. Ultimately, the best advice we can provide policymakers is to take a marginal approach to payday loan regulation.

Wholesale bans on payday loans run the risk of throwing the baby out with the bathwater, potentially removing temptation for some (or pushing them to utilize even more harmful credit products) while outlawing a valuable tool that enables consumption smoothing for others.[158] Even as some call into question the value of credit as a tool for enhancing low-income consumers' welfare, these bans destroy a valuable credit market whose patrons lack access to alternative sources of credit with preferable terms.[159] Related reforms, like interest rate caps,[160] though well-intentioned, often act as de facto bans, leading to the same negative results as outright bans.[161] By contrast, given the cognitive biases of payday loan borrowers—most notably, hyperbolic discounting and myopia—scholars and policymakers have previously identified rollover limits as a targeted, marginal reform for improving the functioning of the payday loan market.[162]

The present study alongside Malone and Skiba's related work on installment loans provides insights into the potential benefits of marginal increases in the size of loan caps. Borrowers making just over $20,000 take out more loans in the future when their present payday loans are capped at $500. As Malone and Skiba demonstrate, borrowers making just over $37,000 similarly take out additional loans when their payday loans increase discontinuously in size from $600 to $900.[163] Taken together, ideal regulation at the intensive margin could mean implementing a cap between $500 and $900 for borrowers earning between $20,000 and $37,000, potentially varying as income varies—at least in Tennessee. Perhaps, instead of strict discontinuities in loan sizes, caps could vary as a function of income without any cap at all.[164]

158. *See supra* notes 73-85 and accompanying text.

159. *See* Bhutta et al., *supra* note 2, at 224-25 (noting payday loan users' limited credit options).

160. *See supra* notes 103-107 and accompanying text.

161. PACKMAN, *supra* note 20, at 17 (noting the effect of interest rate caps); *see* Campbell, *supra* note 74, at 102-03 (same).

162. *See supra* notes 103-107 and accompanying text.

163. Malone & Skiba, *supra* note 156, at 371-72.

164. *See* Malone & Skiba, *supra* note 3, at 320 ("They determined that there was little benefit from imposing an upper limit on payment-to-income ratio, but there could be substantial costs in terms of reduced credit availability to borrowers who do not have access to alternative

But even this suggested reform might prove unwise in practice should state regulators take it up. This potential for failure is not an indictment of regulation altogether but an endorsement of regulation at the margin as an approach to policymaking. Through marginal experimentation with payday loan regulation, including with the loan caps and other regulations described above, states can explore what policy works in their specific context. Economists, legal academics, and other scholars, in turn, should continue their assessment of these state-level actions and share the lessons of each marginal regulation so that the regulatory process becomes iterative, slowly converging on an efficient, equitable form of payday loan regulation—a process that would likely produce benefits in myriad regulatory spaces.

Conclusion

Do the benefits of payday lending outweigh the costs? Despite our best efforts to definitively answer this question, it still depends.[165] Nonetheless, using administrative data from a payday lender operating in Tennessee, we were able to shine some light on this question in the new context of online payday lending. Ultimately, we find that while Tennessee's $425 loan cap increased future indebtedness, it had negligible effects on defaults, suggesting that a marginal increase in the loan cap might be warranted for some higher-income borrowers.[166]

History has produced several regulations beyond loan size caps that states could tweak at the margin and implement. No matter the precise contours of states' marginal regulations, whether at the extensive or intensive margin, they could enable an iterative process whereby state regulators continually update their policies in lockstep with the results those policies produce on the ground. The demonstrated benefits of payday lending, in the online setting examined here and in other settings, support this iterative and marginal approach. By contrast, outright bans on payday lending undermine these considerable benefits for some by fixating on the potential costs borne by others. Marginal regulation takes a more balanced approach, focusing on costs and benefits holistically and attempting to maximize benefits and minimize costs for all parties by precisely carving away the harmful parts of a market and preserving the beneficial parts. The uncertainty surrounding the effects of payday loan regulation make this market ripe for marginal interventions.

sources of credit."); *see also* Howard Beales & Anand M. Goel, Small-Dollar Installment Loans: An Empirical Analysis (Mar. 20, 2015) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2581667 [https://perma.cc/N398-TPWE].

165. *See* SERVON, *supra* note 1, at 80.

166. *See supra* Section II.C.