Paying Off: Evaluating Credit Card Minimum Payment Requirements

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Abstract

We evaluate a hard paternalistic policy that increased credit card minimum payments in Quebec to 5 percent of the balance without changing them in the rest of Canada. We estimate the causal effects of restricting repayment choices by applying a synthetic difference-in-differences methodology to comprehensive Canadian consumer credit reporting data. In the long run, the policy increases minimum payments by 75 percent and reduces revolving debt by 26 percent. The policy persistently reduces access to credit and increases delinquencies but not defaults. Overall, consumer welfare improves unless the cost of lost credit access exceeds \$16 to \$54 per Quebec consumer.

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1 Introduction

A key challenge in consumer financial protection is what to do when disclosure regulation and nudges are ineffective at achieving socially efficient improvements in consumer outcomes. One controversial response is hard paternalism: policies that restrict consumer choice (Campbell, 2016; Laibson, 2020; Campbell and Ramadorai, 2025). Evaluating such policies requires estimating their costs and benefits across consumer groups, and then judging whether those trade-offs justify intervention.

We evaluate hard paternalism in the Canadian credit card market. We study a policy that restricts credit card issuers in how they set the minimum payment: the amount a cardholder is required to pay to remain in good standing. The rationale is that restricting cardholders' repayment choice by requiring them to pay more of their balance each month will reduce credit card debt.

A policy that increases minimum payments may be ineffective at reducing credit card debt or have costs that outweigh the benefits. Consumers may respond by increasing spending and leaving their balance unchanged, and therefore the overall effects on debt are theoretically ambiguous (Castellanos et al., 2026). Since credit cards are a form of insurance, forcing liquidity-constrained consumers into delinquency is inefficient, as it triggers fees that further increase indebtedness and can lead to inefficient default. These costs may fall disproportionately on liquidity-constrained borrowers. The benefits accrue to behavioral consumers who are not liquidity-constrained but who would otherwise carry too much debt. On the issuer side, higher minimum payments may make some lending unprofitable, leading issuers to ration credit.

The policy we study is Quebec's consumer protection legislation ("Bill 134"), implemented starting in August 2019 to prevent over-indebtedness.[1] Quebec is the second most populous Canadian province and 89% of adult Quebec residents hold at least one credit card (Statistics Canada, 2019). Prior to August 2019, no Canadian regulation restricted how credit card issuers calculate minimum payments. Bill 134 requires that in Quebec, starting in August 2019, credit card minimum payments must be at least 2% of the balance for all cards opened before August 2019 (Phase I). For these cards, minimum payment requirements increase by 50 basis points in August of each year from 2020 to 2025 (Phases II to VII), when they reach 5% of the balance. Bill 134 also requires that, for cards opened starting in August 2019, credit card minimum payments must be at least 5% of the balance.

We evaluate the trade-offs by measuring the effects of Quebec's minimum payment

[1] Legislative changes can be found here: http://m.assnat.qc.ca/en/travaux-parlementaires/projets-loi/projet-loi-134-41-1.html

policy on credit card revolving debt (statement balance less payments), credit access (credit limits and new card openings), and transitions into credit card delinquency and default. We use consumer credit reporting data from TransUnion containing monthly anonymized account-level information on credit cards held by all Canadian consumers between 2018 and 2026. We complement this with data from Mintel Comperemedia on credit card offers. Finally, we model the response of credit card issuers and evaluate the welfare implications.

We estimate the causal effects of Bill 134 on consumers in Quebec using a synthetic difference-in-differences (SDID) design, constructing a control from eight unaffected Canadian provinces. The SDID approach is natural for cases such as ours where only one geographical area is treated. Arkhangelsky et al. (2021) and Arkhangelsky and Imbens (2024) demonstrate that SDID typically outperforms both synthetic controls and difference-in-differences (DID) approaches. Although the DID approach uses vastly more data and might seem like the more obvious estimator, the fact that only one area is treated means that disaggregated data does not increase power. Our results are robust to using a DID approach with disaggregated data.

We find that Bill 134 immediately and persistently increases minimum payments. In the very short run, this effect is mechanical: before the policy, 21% of cards in Quebec had a minimum payment of less than 2% of the statement balance and 62% of less than 5%. We estimate a $14 average increase in credit card minimum payments in the month that the policy was introduced, which is a 12% increase over the pre-policy Quebec baseline mean.

We estimate that Phase I of the policy reduced the amount of credit card revolving debt in Quebec by $155, representing a 6% decline relative to the baseline mean. There is also, however, an increase in consumers' transitioning into delinquency (measured as 30+ days past due), peaking at an increase of 29% one month post-policy. We find no evidence that these transitions translate into increased defaults (measured as 90+ days past due), indicating temporary adjustment rather than severe liquidity constraints.

The long-run effects of Bill 134 are visible after the final phase (Phase VII), more than six years later: minimum payments rise by $89 per month, representing a 75% increase from the baseline mean. Reductions in revolving debt are permanent and grow as minimum payment requirements tighten in August of each year. By Phase VII, the policy led to a reduction in mean revolving debt of $618, a 26% decrease from the baseline mean. We estimate that this could result in approximately $720 million in annualized reduced interest costs for consumers in Quebec, a decrease in revenue for credit card issuers. The debt reduction is concentrated among consumers who revolved debt pre-policy, with prime and near prime credit scores, and exists among groups of consumers the prior literature has classified as being behavioral based on their payment behaviors (Keys and Wang, 2019;

Gathergood et al., 2019; Agarwal et al., 2026a). Consumers reduce their debt by more than can be explained by simply increasing their payments to meet the higher minimum payment requirement: such results do not appear consistent with standard preferences or binding liquidity constraints. In the long run, transitions into delinquency increase (driven by pre-policy revolvers), but again we see no evidence of increasing defaults, and our difference-in-differences approach finds no increase in delinquencies and a significant decline in defaults.

We find reduced credit access in Quebec after more than six years, though this estimate is less precise than our other results. In addition to lower credit limits on cards opened pre-policy Phase I, we find evidence that Bill 134 led to a long-run reduction in the number of new cards opened, and these cards also have lower limits. In the short-run, fewer new card openings partially reflect issuers anticipating the policy. We show that issuers concentrated mailings in July 2019 to pull forward new card openings by existing Quebec customers before the 5% requirement took effect, with temporarily more generous offer terms.

To organize our supply-side findings, we develop a three-period model of credit card supply in which banks face heterogeneous costs of changing their minimum payment formula in a given jurisdiction. The model rationalizes two empirical patterns: the reduction in credit limits and the cross-issuer dispersion in their responses to Bill 134. The model also clarifies why the policy increases delinquency without raising default. While served borrowers face a higher per-borrower default probability when minimum payments rise, the contemporaneous rationing of the riskiest applicants approximately offsets this increase, leaving average equilibrium default rates roughly unchanged.

Overall, the policy permanently reduces revolving debt and limits credit access, while raising delinquency transitions that do not translate into defaults. Whether this improves consumer welfare depends on the model of borrower preferences. Because unconstrained, above-minimum payers deleverage—behavior inconsistent with standard preferences—we adopt a behavioral criterion, using a sufficient-statistics approach that innovates by accounting for the supply-side response. We estimate that the policy is welfare-improving so long as the actual cost of loss of credit access is not larger than \$16 to \$54 per Quebec consumer. The supply correction is important as the welfare estimates without this are substantially larger: \$56 to \$148 per Quebec consumer.

By estimating the trade-offs of a paternalistic policy in a credit market, our paper contributes to literatures spanning household finance, public economics, and behavioral economics. Allcott et al. (2022) combine theory and empirical evidence to evaluate mistakes in the payday loan market. Cuesta and Sepúlveda (2021) study the trade-off between consumer protection from bank market power and reduction in credit access in the context of restricting interest rates on unsecured consumer loans in Chile.[2] This prior work shows that capping interest rates is a blunt policy tool, restricting credit to the highest credit risk consumers, who may be the ones that benefit the most from credit access to smooth temporary fluctuations. Instead, restricting payment terms, such as credit card minimum payments, may be a better-targeted policy if it enables liquidity-constrained consumers to borrow while forcing unconstrained behavioral consumers to pay more to reduce their interest costs. Paternalistic policies are also debated across a broad range of topics outside consumer financial protection, such as energy efficiency policies and sugar taxes (Allcott, 2016; Allcott et al., 2019).

Our second contribution is to extend the literature on consumer financial protection. Credit card debt appears to often reflect financial illiteracy (e.g., Lusardi and Tufano, 2015; Seira et al., 2017; Adams et al., 2022; Jørring, 2024) and behavioral biases (as reviewed in Beshears et al., 2018; Gomes et al., 2021) and is notoriously hard to reduce. Prior research finds that information disclosure requirements and nudges are largely ineffective at reducing credit card debt in the long run (e.g., Agarwal et al., 2015; Seira et al., 2017; Adams et al., 2022; Guttman-Kenney et al., 2025; Guttman-Kenney, 2026; Han and Yin, 2026). Policies restricting shrouded late fees (Agarwal et al., 2015) or raising interest rates over time (Nelson, 2025) have been effective at reducing borrowing costs but are not designed to reduce revolving debt. A smaller literature studies credit card issuers' supply-side responses, including their minimum-payment-setting incentives (Katz et al., 2024) and their use of risk-based credit limits to manage default risk (Agarwal et al., 2018; Matcham, 2025). We contribute to this literature by providing causal estimates of a market-wide minimum payment regulation that is effective at reducing long-run revolving debt, and evaluating the benefits and costs after accounting for supply-side responses.

We are unaware of prior work estimating the causal and welfare effects of an economy-wide minimum payment policy. Existing evidence comes from voluntary single-issuer changes in North America (d'Astous and Shore, 2017; Keys and Wang, 2019), experimental or single-issuer interventions in Mexico (Medina and Negrin, 2022; Castellanos et al., 2026), and a nationwide Turkish policy that raised minimums from 20% to 40% while also requiring borrowers to regularly repay at least 50% of their balance (Agarwal et al., 2023). We provide the first estimates aggregated across a cardholder's full portfolio, and the first

[2] Also see Melzer (2011) and Cherry (2026) for papers that examine the effects of interest rate restrictions on unsecured loans, and Agarwal et al. (2026b) that studies a ban on new unsecured debt for highly indebted consumers in Singapore. Separately, Garber et al. (2024) show that the Brazilian government's expansion of payroll credit led consumers to accumulate high-interest debt and reduce consumption, with results consistent with unsophisticated over-borrowing.

for consumer-level revolving debt (balances net of payments) rather than statement balances; the latter is a biased proxy that does not net out payments (Guttman-Kenney and Shahidinejad, 2025; Gibbs et al., 2025). The closest portfolio-level estimates (Keys and Wang, 2019, Online Appendix Figure A7) use statement balances; other work observes only single-account data, masking reallocation across a consumer's cards.[3] Observing a cardholder's full portfolio, rather than a single account, is also what lets us detect the reallocation across cards and the contraction in limits through which issuers respond—responses that we show affect consumer welfare.

Finally, our setting can inform policymakers across developed credit card markets, where credit cards are regulated nationally and policy variation is therefore scarce. Before Bill 134, minimum payments in Canada were commonly below the U.K. and U.S., where regulation typically results in minimum payments being of 1% of the balance plus interest and fees (Tescher and Stone, 2022). Bill 134 moved Quebec from below these levels to well above them, so our estimates span the range of tightening policymakers around the world might consider informative.

The paper proceeds as follows. Section 2 describes the institutional details of minimum payments and the Quebec policy, the data we use, and our empirical methodology. Section 3 shows how issuers changed their minimum payment formulas and presents our SDID estimates of the effects on consumers. Section 4 presents our results examining credit supply decisions, including a model of issuer responses to the regulation that rationalizes the observed issuer behavior. Section 5 estimates the implications for credit card issuers and for consumer welfare. Section 6 briefly concludes.

2 Minimum Payments, Data, and Methodology

2.1 Minimum Payments

Minimum payments. Credit card interest compounds on balances net of payments, so even small changes in minimum payment amounts can produce large changes in the amount of time it takes to pay off credit. For example, moving from a 2.0% to a 2.5% minimum payment reduces the time to repay $1,000 in debt from 26 to 14 years (assuming an interest rate of 19.9% and no further spending).

[3]Castellanos et al. (2026) estimate account-level effects on debt only for the credit card issuer in their experiment, because their linked credit reporting data does not contain credit card balances or payments. d'Astous and Shore (2017) and Agarwal et al. (2023) likewise observe only one credit card issuer. Medina and Negrin (2022) estimate effects at the account level because their account-level data cannot be linked at the consumer level, the same data constraint as in the main estimates of Keys and Wang (2019).

Revolving credit card debt is common: approximately 40% of Canadian and 50% of American cardholders carry a balance from month to month (Statistics Canada, 2019; Board of Governors of the Federal Reserve System, 2023, see Appendix A for additional details on Canadian credit card use). There are strong economic incentives to make at least the minimum payment. Doing so allows borrowers to avoid being charged late fees and interest on delinquent balances (Gathergood et al., 2020).[4] Furthermore, if a borrower has not made their minimum payment on time and becomes delinquent for 30 days or more, this information is recorded on their credit report, which negatively affects their credit score and may ultimately limit future credit access.

Whether a consumer makes repayments above the minimum or not could be driven by temporary liquidity needs or mistakes. Minimum payments tend to be poorly understood by consumers (Soll et al., 2013; Seira et al., 2017; Adams et al., 2022; Hirshman and Sussman, 2022), who tend to "bunch" repayments at or just above minimum payment amounts (Keys and Wang, 2019; Medina and Negrin, 2022; Guttman-Kenney, 2026). Seemingly-unconstrained consumers' payments appear sensitive to the minimum payment amount in a way inconsistent with pure liquidity constraints (Keys and Wang, 2019; Medina and Negrin, 2022; Castellanos et al., 2026), and sometimes attributed to the minimum payment acting as a reference point that consumers target (Sakaguchi et al., 2022; Katz et al., 2024; Guttman-Kenney, 2026).

Quebec policy. Prior to August 2019, there were no Canadian regulations restricting how credit card issuers should calculate minimum payments. Minimum payments were commonly as low as $10 plus interest and fees, irrespective of a consumer's statement balance. Table 1 displays the yearly minimum payment rules of eleven Canadian issuers from July 2019 to 2026. In July 2019, each issuer's rule was the same across Canadian provinces. We interpret this choice as profit-maximizing, since each issuer is unconstrained pre-policy and only constrained in Quebec post-policy.

On August 1, 2019, a new regulation, Bill 134, became effective in Quebec. Bill 134 amended Quebec's Consumer Protection Act, restricting how credit card minimum payments should be calculated for all Quebec credit cards (summarized in Figure 2). The regulation requires that credit cards opened before August 1, 2019 ("existing credit cards") have a minimum payment of at least 2% of the balance, the timing of which we describe as Phase I of the policy. For these existing credit cards that are still open on August 1, 2020, this requirement tightened minimum payments by an additional 50 basis points to at

[4]In Canada, credit card issuers have the right to increase the interest rate on borrowers who do not make their minimum payments. This practice was banned in the U.S. since 2010 under the CARD Act (Nelson, 2025). No Canadian regulator collects information on the extent that this happens.

least 2.5% of the balance ("Phase II"). Each year after 2020, for cards that remain open in August of that year, additional policy Phases III to VII increase the minimum payment by another 50 basis points, until August 1, 2025, when the minimum payment must be at least 5% of the balance ("Phase VII").[5] The regulation also required that all credit cards opened after July 31, 2019 ("new credit cards") have a minimum payment of at least 5% of the balance. During our period of study (2018—2026), no other Canadian province imposed minimum payment regulation.

The objective of the regulation was to reduce credit card debt, a salient concern in Canada, where consumer non-mortgage debt exceeded twenty-three thousand dollars per person in 2018. One of the architects of Bill 134, Quebec politician André Lamontagne, describes why they consider such interventions necessary: "Consumers, and in particular the most vulnerable among them, do not always have the tools to make informed decisions regarding the credit offered to them" and notes that the aim is "to avoid consumer over-indebtedness," (see National Assembly sittings on Bill 134 in October and November 2017). When the regulation came into effect, the Quebec Consumer Protection Office similarly stated "the increase in the minimum payment aims to prevent debt problems," and "it is advantageous to pay the balance of your credit card each month, because no credit charges are then applicable."

2.2 Data

Canadian consumer credit reporting data. We use monthly data from the Bank of Canada's anonymized consumer credit reporting data sourced from TransUnion. These data cover all Canadians with credit reports between 2018 and 2026, redacted of personal information. See Gibbs et al. (2025) for a review of such credit reporting data.

[5]This regulation received assent on November 15, 2017, having been announced on May 2, 2017, following earlier unsuccessful attempts to introduce similar legislation in Bill 24 during 2011–2012. Bill 134 applies based on the province of residence rather than the province that the card was opened in. This means that if a consumer moves into Quebec, their outstanding credit cards also need to comply with this regulation. An earlier version of Bill 134 proposed minimum payments increase from 2% to 5% by 100 basis points per year; however, there was concern that this increase would be too large a shock to household budgets. For example, one Quebec politician, Catherine Fournier, said when the bill was being debated in the Assembly, "We find it good that we are gradually increasing to 5%, but we were afraid of the price shock that it could have on more vulnerable consumers." Also as part of the version of Bill 134 that came into effect, starting in August 2019, credit card issuers in Quebec had to display information showing the estimated number of months (years, if applicable) required to pay off the balance owing if only the minimum payment is made each period. An earlier version of our paper (Allen et al., 2024) found that these disclosures introduced in Quebec were also ineffective, consistent with the previous literature on credit card disclosures in Mexico (Seira et al., 2017), the U.K. (Adams et al., 2022), and the U.S. (Agarwal et al., 2015; Keys and Wang, 2019). As a result, we are confident that any effects that we observe are attributable to the minimum payment formula changes, and not to the disclosures.

We observe consumer-level information including a TransUnion Canada credit score (ranging from 300 to 900, with a higher score being lower risk), and the postal code of the consumer's primary address. For each consumer, we observe tradeline data that records monthly account-level information for each of their credit accounts. These data include credit cards, mortgages, personal loans, auto loans, lines of credit, student loans, and utilities. At the account-level, we observe opening and closing dates. Each month at the account-level, we observe the outstanding balance (i.e., statement balance inclusive of interest and fees), monthly required payments, monthly actual payments, delinquency status (30, 60, and 90 days past due), and credit limits. We observe anonymized identifiers to follow individual consumers and accounts over time.

Importantly, we observe consumers' actual monthly payments for nearly all credit cards. Ten of the eleven credit card issuers furnish actual payments information. This enables us to accurately measure how much revolving debt a consumer carries forward. This is a notable advantage relative to credit reporting data in the United States, where actual payments information has not been furnished to credit bureaus by any of the six largest credit card issuers since 2015 (Guttman-Kenney and Shahidinejad, 2025).

As with many countries, Canadian credit reporting data is affected by the start of the COVID-19 pandemic. At the start of COVID-19, some credit card issuers temporarily stopped sharing timely information with credit reporting agencies, sometimes related to temporary pandemic-related forbearance policies—although take-up of these forbearance policies in Canada was low, as shown in Allen et al. (2022). Therefore, while we present estimates during the pandemic, the estimates for those months likely reflect more than just the effects of Bill 134 on consumer credit card behavior. Like the rest of Canada, however, there was regulatory forbearance in Quebec during the pandemic as well as substantial government support. Somewhat surprisingly, Quebec did not pause the scheduled increase in minimum payment requirements in August 2020.

Mintel Comperemedia. We include credit card solicitation data from Mintel Comperemedia. This is a monthly panel of nearly 8,000 Canadian households who report on all their credit card offers. It includes the issuer identity, contract terms, and socio-demographics of the panelist (e.g., income, age, education, and location). We use monthly data from July 2018 to March 2020 aggregated to the provincial level. In the U.S., Han et al. (2018) establish that Mintel data are a good indicator of credit supply.

2.3 Sample Selection

Sample selection for main analysis. We aggregate each month of card-level data to the consumer-level, and then to the province-by-calendar-year-month level to produce means of our outcomes for credit cardholders. We have a balanced panel of nine Canadian provinces, $p \in \{1, ..., 9\}$, observed for 97 calendar-year-months, $t \in \{-18, ..., 78\}$. These nine provinces cover 99.3% of Canada's population, which itself is similar in population to California. Our 97 month panel spans from 18 months before the Quebec policy takes effect in August 2019 to 78 months after. The last month of data observed is February 2026. Our dataset contains 24.4 million consumers in Canada as of August 2019, and of these, 5.8 million (24%) are in Quebec, consistent with official statistics.

We include all consumers who had a credit card opened before August 2019. We aggregate the portfolio of credit cards held by a consumer, which includes any new cards opened by a consumer over time along with cards opened before August 2019. Closed accounts continue to be reported in our dataset. If a card is closed during our sample, we classify it as having a zero statement balance, zero minimum payment amount due, and zero actual payment made, and regard such observations as a payment in full. The card is therefore classified as current unless it was previously delinquent or defaulted. We winsorize continuous variables to their 99.9th percentile. In cases where issuers start reporting previously-missing information on a card, we impute backwards to ensure that changes in variables over time are not due to reporting changes, which would bias our estimates toward zero. In cases where an issuer does not furnish updated information to TransUnion in a particular month, we impute based on previously furnished information. Such imputation primarily affects the first six months of the COVID-19 pandemic.

Sample selection for new cards. We construct a separate dataset to study Quebec's 5% minimum-payment requirement for new cards opened from August 2019 onward. We sample all credit cards opened from July 2018 to February 2026 and aggregate them into province-by-opening-month cohorts. This sample includes the intensive margin of existing cardholders taking out new cards and the extensive margin of new consumers who enter the market over time. We define the opening month using the tradeline opening-date variable (not first appearance in the data), since new accounts can take several months to show up on credit reports (Gibbs et al., 2025).

Outcomes. We measure our main outcome variables as follows:

- **Minimum payment** is the reported scheduled minimum payment amount. It is inclusive of any interest and fees, as well as repayment of capital.

- **Revolving debt** is defined in Equation (1), following Gibbs et al. (2025) and Guttman-Kenney and Shahidinejad (2025). For each credit card account, i, and month t, we record the amount of credit card debt remaining after subtracting actual payments, $P_{i,t}$, from the previous month's statement balance, $B_{i,t-1}$. If this calculation is negative, we bound at zero. This can happen when cardholders repay more than their statement balance. Given that credit cards have a 21-day grace period, statement balances are recorded in month $t-1$ rather than in month t.

$$D_{i,t} \equiv \max(0, B_{i,t-1} - P_{i,t}). \tag{1}$$

- **Any delinquency transition** is a binary variable that takes a value of one if any credit card account transitions from being current with payments (no payments behind or less than 30 days behind) in the previous month to being 30 or more days past the date when the minimum payment is due this month. A delinquency transition can reflect either a liquidity constraint or an adjustment to the new payment obligation, a distinction we return to in Section 3.3. We show results for this outcome in percentage points (pps).

- **Any default transition** is a binary variable that takes a value of one if any credit card account transitions to being 90 days or more past the date when the minimum payment is due (from previously being less than 90 days past due). This threshold is one that issuers use for assessing credit risk and is a proxy for charge-offs (Gibbs et al., 2025). We show results for this outcome in percentage points (pps).

- **Credit limit** is the total value of the credit card limit.

Summary Statistics. We briefly describe the mean consumer credit card portfolio characteristics in Quebec and Canada as of July 2019, the month before Bill 134 comes into effect. The average minimum payment in Quebec is \$120, compared to \$93 across Canada. The average revolving debt is \$2,383 compared to \$2,633 across Canada. The average credit card limit is \$12,838 compared to \$15,303 across Canada, with statement balances that lead to a utilization rate of approximately 30% of their limit, on average, in both cases. The transitions into delinquency are 0.8% for Quebec and 0.9% for Canada, and the transitions into default are 0.20% for Quebec and 0.24% for Canada. Credit scores are 773 in Quebec and 766 in Canada. See Appendix Figure B1 for a time series of consumer means for each province, each month across a broader set of outcomes.

Consumer heterogeneity. We study heterogeneity by segmenting consumers using pre-policy behavior, which matters when behavioral and non-behavioral agents coexist (e.g. Campbell, 2016; List et al., 2023; Allcott et al., 2022, 2025; Brown et al., 2026; Choukhmane and Palmer, 2026). Table 3 shows the shares of consumers in Quebec across heterogeneous groups as of August 2019. Our sources of heterogeneity are:

- **Transacting status:** We define consumers as "transactors" if they have zero revolving debt in every one of the twelve months pre-policy. We define all other consumers as "revolvers." If transactors pay in full irrespective of their minimum payment amount, the inclusion of this group likely attenuates the policy's overall effects, which affect revolvers.

- **Credit score:** We use standard TransUnion Canada credit score thresholds for segmenting consumers into five groups based on their mean credit score in the twelve months pre-policy. In increasing order of creditworthiness, these are: subprime (<600), near prime (600-699), prime (700-769), prime plus (770-829), and superprime (830+). Consumers with lower credit scores have higher delinquency and default rates and are more likely to revolve debt, whereas higher-credit score consumers are more likely to be transactors (Agarwal et al., 2015; Guttman-Kenney and Shahidinejad, 2025; Drechsler et al., 2025).

- **Payer type:** We follow Keys and Wang (2019) in defining consumers into four groups by the types of payments they made in the twelve months pre-policy. Keys and Wang (2019) calculate this at the account-level as they do not observe consumer-level data, whereas we adapt this to the consumer-level based on card-months. The "Exact Min. Payer" group are consumers who pay exactly the minimum in at least 50% of months pre-policy. The "Near Min. Payer" group are consumers who pay strictly more than but within $50 of the minimum payment amount in at least 50% of months pre-policy. The "Full Payer" group are consumers who pay their balance in full in at least 50% of months pre-policy (therefore broader than "transactors"). Finally, the "Mixed Payer" group consists of the remaining consumers.

- **Balance-matching:** We follow Gathergood et al. (2019) in defining consumers by whether or not they pay multiple cards proportionally to their balance on each card. For this, we can only classify consumers with multiple cards, who do not pay in full on all their cards and also do not only pay the minimum on all their cards. The use of a balance-matching heuristic is a proxy for behavioral consumers (Gathergood et al., 2019; Ponce et al., 2017; Agarwal et al., 2026a).

2.4 Empirical Methodology

Synthetic difference-in-differences (SDID): Our paper provides an example of how the SDID methodology can be used for policy evaluation. We estimate the effects of changes to credit card minimum payments in Quebec on consumers who had existing credit card accounts opened before August 2019. To estimate the causal effects of this policy we use a synthetic difference-in-differences (SDID) identification strategy (Arkhangelsky et al., 2021; Arkhangelsky and Imbens, 2024; Clarke et al., 2024). Rather than require parallel trends as in a DID approach, the SDID approach constructs weights to match pre-policy trends. Unlike synthetic controls, it allows for causal effects to be accurately estimated even if there are differences in the levels of outcomes. The SDID approach is the natural estimation method for our setting where only one geographical area is treated and there are level differences in some outcomes. We evaluate the effects of changes in Quebec compared to a control group of other Canadian provinces. Our specification is as follows:

$$\left(\hat{\delta}, \hat{\mu}, \hat{\alpha}, \hat{\beta}\right) = \underset{\delta,\mu,\alpha,\beta}{\operatorname{argmin}} \Big\{ \sum_{p=1}^{9} \sum_{t=-18}^{78} \Big(y_{p,t} - \mu - \alpha_p - \beta_t - \delta\big(\mathbb{I}\{t \geq 0\} \times \mathbb{I}\{p = QUEBEC\}\big) \Big)^2 \hat{\omega}_p \hat{\lambda}_t \Big\}. \tag{2}$$

In equation (2), we have one observation per province (p), per calendar year-month (t). The term $y_{p,t}$ denotes our outcomes of interest. We have fixed effects for each province, α_p, and time period, β_t. An important distinction between SDID and DID is that the former constructs weights for each province, $\hat{\omega}_p$, and each time period, $\hat{\lambda}_t$, to construct a synthetic Quebec from the eight potential control provinces over time. After the six months used for constructing the SDID weights, each time period receives equal time weights. Table 2 shows that each province is a fairly similar share of synthetic Quebec.

The theoretical literature is currently considering how best to approach multiple outcomes (Sun et al., 2026; Tian et al., 2026). One approach is to construct outcome-specific synthetic controls but this makes it conceptually challenging to interpret results across outcomes. Instead, we calculate one set of weights and then apply it across all our specifications. We compute the province and time weights using only the six months of data that occur thirteen to eighteen months before Bill 134 came into effect. The weights are only based on statement balances as the outcome variable.

Our approach enables us to have three separate ways to evaluate whether our weighting strategy provides a suitable synthetic control for Quebec. First, there should be no effect on statement balances pre-policy. Second, outcomes not used in weighting should also show no pre-policy effects. Third, effects should emerge exactly at the policy date, despite the weights using no minimum payment information. In Section 3, we show that our methodology passes these diagnostics. Our approach is robust to alternative weighting approaches (Appendix Figure B2).

Once we have calculated the weights, we can calculate our parameters of interest, the dynamic estimated average treatment effects on the treated, δ_τ, at time period τ. In this, $\tau < 0$ checks for pre-trends, and $\tau \geq 0$ shows the effects of the policy over time. Following Clarke et al. (2024), we calculate this as the differences in the weighted means of outcomes between Quebec (QC) and our synthetic Quebec control (SQC) at each event time period τ relative to the baseline:

$$\delta_\tau = \left(\bar{y}_\tau^{QC} - \bar{y}_\tau^{SQC}\right) - \left(\bar{y}_{baseline}^{QC} - \bar{y}_{baseline}^{SQC}\right). \tag{3}$$

The term $\bar{y}_\tau^{QC}$ is the average outcome for Quebec ($p = 1$) at event time τ; similarly, $\bar{y}_\tau^{SQC} = \sum_{p=2}^{9} \hat{\omega}_p \hat{y}_{p,t}$ shows the average outcome across each of the eight non-Quebec provinces, after applying the SDID weights to create our synthetic Quebec control. Our pre-period baseline is calculated using six months of data that occur 18 to 13 months before August 2019 by $\bar{y}_{baseline}^{QC} = \sum_{k=-18}^{-13} \hat{\lambda}_k y_{1,k}$ and $\bar{y}_{baseline}^{SQC} = \sum_{k=-18}^{-13} \sum_{p=2}^{9} \hat{\omega}_p \hat{\lambda}_k y_{p,k}$ for Quebec and our synthetic Quebec control, respectively, where k is event time. To allow for anticipation effects, the estimation treats the twelve months before August 2019 as part of the post-period. In all figures and tables, however, we date event time zero to August 2019, so that estimates line up with the timing of Bill 134.

To increase the precision of our estimates, we focus on versions of this SDID in which we split by each phase of the policy (δ_j^{PHASE}) rather than by month. For example, to estimate Phase I of the policy, δ_I^{PHASE} averages data across event months 0 to 11. Separately, we also estimate a single effect pooled across all policy phases: δ^{POST}.

We estimate standard errors following the placebo variance estimation approach of Arkhangelsky et al. (2021). Algorithm 4 in their paper is the recommended approach for cases such as ours with a single treated cluster (in our case, Quebec) where the asymptotic properties of other approaches, such as bootstrapping, would not hold because they require a large number of treated units. Alvarez et al. (2026) provide a broader review of inference under one or few treated clusters, noting how the placebo variance method follows the main idea of the earlier method of Conley and Taber (2011).

We also apply the same SDID methodology and weights to quantify the effect of Bill 134 on new credit card openings and Mintel data on credit card offers.

Difference-in-differences (DID): The SDID approach involves substantial aggregation of our consumer-card-level data. We therefore also estimate the effects of the policy using consumer-level data in a difference-in-differences (DID) approach for robustness. We continue to leverage, however, the estimated weights from our SDID and conservatively estimate standard errors using placebo variance estimation at the provincial level. We estimate the following:

$$Y_{c,t} = \sum_{\tau \neq -1} \delta_\tau \Big(\mathbb{I}\{t = \tau\} \times \mathbb{I}\{p(c) = QUEBEC\} \Big) + \gamma_c + \gamma_t + \varepsilon_{c,t}. \tag{4}$$

In Equation (4), there is one observation per consumer c per calendar year-month t, where we use data from event month $\tau = -12$ on, with $\tau = -1$ as the omitted category. We include time fixed effects (γ_t) and consumer-level fixed effects (γ_c) to account for unobserved consumer-level heterogeneity. We divide our SDID provincial weights by the number of consumers in a province. The sum of weighted consumers in a province, therefore, equals the SDID provincial weight ($\hat{\omega}_p = \sum_{c=1}^{C} \hat{\omega}_c$). The dynamic effects of the policy are given by δ_τ, the coefficients on the interaction between event time dummies and an indicator for a consumer's province ($p(c)$) being in Quebec. Our results are consistent across SDID and DID estimators (see Appendix Figure B3 for monthly DID estimates). We also estimate a phased version of our DID equation:

$$Y_{c,t} = \sum_{j=I}^{VII} \delta_j^{PHASE} \Big(\mathbb{I}\{PHASE(t) = j\} \times \mathbb{I}\{p(c) = QUEBEC\} \Big) + \gamma_c + \gamma_t + \varepsilon_{c,t}. \tag{5}$$

Instead of estimating the effects of the policy each month, we now have only one indicator, δ_j^{PHASE}, for each phase of the policy $j \in \{I, II, III, IV, V, VI, VII\}$. We also show the effect of the policy pooled across all phases by estimating Equation (6), using an indicator $POST_t$ that takes a value of one during any phase of the policy:

$$Y_{c,t} = \delta^{POST} \Big(POST_t \times \mathbb{I}\{p(c) = QUEBEC\} \Big) + \gamma_c + \gamma_t + \varepsilon_{c,t}. \tag{6}$$

3 Consumers

3.1 Minimum Payment

The "first stage" is how Quebec's Bill 134 affects credit card minimum payments. For the policy to have a non-trivial effect on cardholder outcomes, such as debt and delinquency, it needs to have a non-trivial impact on minimum payments. We provide descriptive evidence on the distribution of credit card repayments and then proceed to estimate the causal effects using our SDID design.

3.1.1 Minimum Payment Contract Terms

Table 1 summarizes how credit card issuers adjusted Quebec minimum payment contract terms in August 2019. Before Bill 134, seven of eleven issuers required less than 2% of the balance, and thus were forced to tighten existing minimum payment rules in Quebec. Two issuers tightened to 2.0% of the balance while three over-complied by tightening to 2.5%. Two issuers increased their minimum payment to 3.0% of the balance. The remaining four issuers already had minimum payment formulas at 2% or higher and so were not mandated to tighten in Phase I. Indeed, these issuers left their formulas unchanged at 2.0% (two issuers), 2.5%, and 3.0% of the balance. By August 2021, all issuers were at the minimum requirement of 3.0%, except for one that was at 3.5%. Finally, all eleven issuers tightened minimum payment formulas on their new cards opened in Quebec from August 2019 to 5%. We study these issuer decisions in Section 4.

3.1.2 Descriptive Evidence

We use our consumer credit reporting data to describe changes to minimum payment requirements. Figure 1 Panel A shows the mean credit card minimum payment, aggregated across consumers' portfolios of cards, for consumers in each province each month. We see an immediate increase in minimum payments in August 2019 for Quebec (orange) relative to the rest of Canada (black), as well as increases every August as Bill 134 led to additional tightening of 50 basis points per year.

Quantitatively, the fraction of Quebec credit cards with a minimum payment requirement of less than or equal to \$10 declines from 32% to 19% from July to August 2019. In August 2019, only 2% of credit cards in Quebec have a minimum payment of less than 2% of the balance, compared to 21% one month prior. In July 2019, 62% had a minimum payment of less than 5% of the balance, however, by August 2025, only 37% do. In the long-run, the overall distribution of minimum payments has shifted to the right with sharp bunching around 5% (Appendix Figure B4).[6]

[6] These calculations restrict to account months where the minimum payment is greater than zero and the statement balance is greater than \$10. There are several reasons why the fraction of Quebec cards with a minimum payment amount below the 5% requirement does not fall to zero by August 2025. These include: regulatory or issuer forbearance that assist distressed borrowers, business credit cards that are challenging to identify in the data but are excluded from the policy, and installment financing on credit cards which may carry different payment terms.

3.1.3 Causal effects of Bill 134 on Minimum Payments

We use our SDID approach to estimate the causal effect of the Quebec policy on consumers' credit card minimum payments (aggregated across all cards held by a consumer). We first measure the average effect and then introduce heterogeneous effects by consumer type. Figure 1 Panel B shows how the estimated effects on minimum payments change over time, δ_τ from Equation (3), with estimates for each phase of the policy reported in Table 4.

Figure 1 Panel B is methodologically reassuring: there are no pre-trends before Bill 134, and the effect on minimum payments emerges exactly when expected, in August 2019, despite the weights using only statement balances from 18 to 13 months before the policy and no information on minimum payments or other card behaviors. This and subsequent figures using our SDID approach all show 95% confidence intervals from standard errors calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021). Because each estimate is measured relative to a fixed pre-policy baseline, the confidence intervals are tightest near the baseline and widen at later phases, as is standard in event-study designs. The widening is reinforced by the growth in the effect itself, since the estimated dollar increase in minimum payments, and hence its dispersion, rises across phases.

The increase in minimum payments is immediate and persistent. During phase I, the average increase is \$14.7 per month (Table 4 column (1)), and the marginal effects grow as each August brings an additional phase—with the exception of 2020, coinciding with COVID-19 disruptions—reaching \$89.3 per month by phase VII, a 74.9% increase over the baseline. These results are robust to our DID approach (Appendix Table B1 column (1)).

We next split consumers into groups by their pre-policy characteristics to study heterogeneous effects on minimum payments for each phase of the policy. Results are presented in Appendix Figure B5.[7] All consumer groups experience economically large and statistically significant effects on minimum payments that grow over time. Unsurprisingly, the effects are largest for consumers who revolve debt pre-policy or have lower credit scores. For example, during Phase VII of the policy, the average increase in minimum payments is \$97.8 for revolvers compared to \$64.8 for transactors, while subprime consumers have an average increase of \$137.2, whereas superprime consumers have an increase of \$59.8.

[7] The Phase VII estimates on minimum payments by pre-policy credit score are in Appendix Table B2 Panel A, with the outcomes we examine in the following sections contained in panels B to F. The effects on minimum payments for each phase by pre-policy revolvers, transactors, exact minimum payers, near minimum payers, mixed payers, full payers, balance-matchers, and non-balance-matchers are provided in column (1) of Appendix Tables B3, B4, B5, B6, B7, B8, B9, and B10, respectively, with the outcomes we examine in the following sections contained in other five columns.

3.2 Revolving Debt

3.2.1 Causal Effects of Bill 134 on Revolving Debt

Increasing minimum payments does not necessarily reduce a consumer's long-run revolving debt. Consumers can raise spending along with their payments, leaving balances unchanged; and consumers who cannot meet the higher payments incur fees that add to their balances.

In this section, we estimate the effects on consumers' credit card revolving debt. Figure 3 Panel A shows that Bill 134 reduced revolving debt over time. September 2019 is the first month in which payments are due against post-policy statements, and revolving debt declines immediately by $77, with a similar pattern in the unconditional provincial means (Appendix Figure B1 Panel A). The effect persists and grows as each phase tightens minimum payment requirements: Table 4 column (2) and the black estimates in Figure 4 show an average decline of $155 during phase I, rising to $618 by phase VII, a 25.8% decline relative to the baseline mean. These results are robust to our DID approach (Appendix Table B1 column (2)), and are consistent with descriptive survey evidence (Appendix Table A1) showing Quebec consumers more likely to pay in full and less likely to pay only the minimum. The policy thus achieves its stated objective of reducing credit card debt, in sharp contrast to the ineffectiveness of disclosures and nudges at reducing long-run debt (Agarwal et al., 2015; Seira et al., 2017; Adams et al., 2022; Guttman-Kenney et al., 2025; Guttman-Kenney, 2026; Han and Yin, 2026).

Figure 3 Panel A also shows an anticipation effect: revolving debt falls by approximately $60 in the six months before the policy, consistent with issuer communications (by mail and email) prompting some consumers to raise payments early. Our SDID baseline (months -18 to -13) precedes this window, so anticipation does not bias the estimates. This result also explains why the one-month debt estimate is large relative to the contemporaneous minimum-payment increase.

Heterogeneity in payment behavior bounds how much any average treatment effect can reduce revolving debt: consumers who already repay in full have no debt to reduce, so we do not expect one-to-one pass-through from mean minimum payments to mean revolving debt. Figure 4 Panel A shows that the overall effects of the policy (black, with estimates in column (2) of Table 4) are driven by the group of consumers who revolved debt pre-policy (orange, with estimates in Appendix Table B3), and who reduced their revolving debt by $685 as of Phase VII: a 23% decline. In contrast, pre-policy transactors (blue in Figure 4 Panel A, with estimates in column (2) of Appendix Table B4) show null effects in the short-run and small long-run declines by Phase VII.

The heterogeneous effects of the policy are non-monotonic in pre-policy credit score, with the effect concentrated among prime and near prime consumers. Figure 4 Panel B presents SDID estimates by credit score group over the phases of the policy (phase VII estimates in Panel B of Appendix Table B2): the effect on revolving debt has an inverse-U shape, peaking among prime and near prime consumers and statistically insignificant for subprime and superprime consumers by phase VII.

Superprime consumers are typically transactors (Guttman-Kenney and Shahidinejad, 2025), so there is mechanically little debt to reduce. Subprime consumers, by contrast, raise minimum payments the most of any group (roughly \$137 by phase VII), yet their revolving debt falls only about \$278 and is imprecisely estimated, implying that the large increase in required payments translates only weakly into deleveraging. Together with their higher transitions into delinquency but not default (Section 3.3), this is what we would expect if subprime borrowers are liquidity-constrained. The debt-reduction effect is concentrated among near prime, prime, and prime plus consumers, who carry substantial balances and can pay them down. These are consumers who ex-post appear unconstrained, consistent with a behavioral interpretation rather than a pure liquidity-constraint channel.

How much of this deleveraging does the policy itself compel? We bound it with a required-payment ceiling: the most debt reduction higher required minimum payments could generate.[8] Consumers pay down substantially more debt than the policy requires. Revolvers' Phase I average decline in revolving debt of \$199 is roughly twice the \$101 required-payment ceiling (Appendix Table B3). The ceiling is an upper bound, attained only if every revolver would counterfactually have paid exactly the minimum, which they do not; and it is informative only over short horizons, since required payments shrink as balances fall, so summing them over many years overstates what the policy compels.

This gap between actual and compelled paydown is pervasive across revolver types (Figure 4 Panel C; Appendix Tables B5, B6, B7). The starkest case is exact minimum payers, who counterfactually pay essentially the minimum, yet whose Phase I decline of \$1,332 is roughly twenty times their \$68 ceiling. Their credit limits also contract during

[8]Under this required-payment ceiling, the effect on revolving debt in event month τ equals the forced payments accumulated through τ, each bounded by the treatment effect on required minimum payments, holding new spending at its counterfactual path. With a constant monthly effect on minimum payments of \$15.53 during Phase I for revolvers (Appendix Table B3), the implied debt effect is $\$15.53 \times (\tau + 1)$ in event month τ: \$15.53 in month 0, \$31.06 in month 1, and so on up to $\$15.53 \times 12 = \$186.36$ in month 11. Averaging over the twelve months of the phase, as our δ_I^{PHASE} estimator does, gives $\$15.53 \times \frac{1+2+\cdots+12}{12} = \$15.53 \times 6.5 = \$101$. The full accumulation of \$186 bounds only the debt effect in the final month of the phase; because δ_I^{PHASE} averages over all twelve months, including early months in which little required-paydown had yet occurred, the relevant ceiling on the \$199 estimate effect on revolving debt during Phase I (Appendix Table B3) is \$101. Spending responses cannot overturn the required-paydown ceiling: charging more shrinks the measured debt decline, while charging less than counterfactual is a voluntary response.

Phase I, a channel we return to in Section 3.4; even attributing the full reduction to forced deleveraging, the remaining decline exceeds the ceiling. Mixed payers exceed their ceiling by a factor of roughly three. Near minimum payers are the one group to sit below their ceiling in Phase I, but they too exceed it from Phase II onward, when their $594 decline outpaces the $483 that required payments could by then generate. The same pattern holds for consumers who look behavioral by using a balance-matching heuristic and for the multi-card revolvers who do not, each cutting debt by roughly twice its ceiling (Figure 4 Panel D; Appendix Tables B9, B10). These results are difficult to reconcile with binding liquidity constraints.

The initial effects may partly reflect a salience shock that makes consumers more attentive to their bill, but the long-run effects are unlikely to: a salience shock would decay rather than persist. The broader literature likewise finds that cardholders do not change long-term behavior in response to information (Agarwal et al., 2015; Seira et al., 2017; Adams et al., 2022). The persistent response is more naturally behavioral, consistent with how the literature interprets consumer responses to minimum payments (Keys and Wang, 2019; Medina and Negrin, 2022; Katz et al., 2024; Guttman-Kenney, 2026).

Our results differ from Castellanos et al. (2026), who study a Mexican bank's increase from 5% to 10% and find debt initially rises before declining imprecisely after nine months.[9] The contrast likely reflects context: fewer than 10% of Mexican households use credit cards, with much higher delinquency rates suggesting that liquidity constraints are more binding. Consistent with this, Medina and Negrin (2022) estimate that 59% of the effect of the change in minimum payments on payments in Mexico is due to a binding constraint. Evidence from North American credit card markets is (indirectly) consistent with ours, as Keys and Wang (2019) and d'Astous and Shore (2017) both find that borrowers raise their payments when minimums increase.

3.2.2 Causal Effects of Bill 134 on Statement Balances, Spending, & Payments

Consistent with the pattern observed for declining revolving debt over time, we also observe that the policy leads to significantly lower statement balances. Although statement balances are a noisy proxy for revolving debt (they include new spending, see Gibbs et al., 2025; Guttman-Kenney and Shahidinejad, 2025 for more details), the benefit is that this measure

[9]There are no anticipation effects in Castellanos et al. (2026) because consumers were not notified of changes to their contract terms. They measure debt at the credit card account level rather than the consumer level, and because many cards (about 45%) close during their study, they account for this attrition using Lee bounds, which yields imprecise estimates that cannot rule out large increases or decreases: their debt treatment effect turns negative by month nine and declines thereafter, but the bounds widen enough that by the end of the experiment they can rule out neither a decline nor an increase in debt (elasticities of roughly -0.31 and $+0.21$, respectively).

is observable even for the one issuer that does not furnish actual payments information. We report results for each phase in Table 4 column (3). The short-run effect is an average decline in statement balances of \$83 during Phase I, which is a 2.6% decrease relative to the baseline mean of \$3,165. The long-run effect is an average decline of \$714 (22.6%) by Phase VII. These short- and long-run estimates are consistent in size and direction with our revolving debt estimates. The effects on statement balances are robust across estimation approaches, and the heterogeneous estimates are also consistent with the effects on revolving debt.[10]

By definition, the persistent decrease in revolving debt must reflect consumers raising their payments by more than their new spending plus financing charges, since otherwise revolving debt would rise. This net decrease could come from different combinations of changes to payments and debt, so we decompose it by examining spending and payments separately, with both measures being inclusive of financing charges. Following Guttman-Kenney and Shahidinejad (2025), we measure spending as $B_t - B_{t-1} + P_t$ (if this is greater than or equal to zero and 0 otherwise), where B_{t-1} is the statement balance at $t-1$ and P_t is the actual payment made against that balance.

By August 2025, the share of Quebec payments at or below the 5% minimum payment floor appears far smaller than can be explained by pure liquidity-constraints, under which payments previously below 5% bunch at the new minimum or remain below it in delinquency, leaving that share broadly unchanged (Keys and Wang, 2019). Instead, a substantial mass of payments moves well above the 5% floor, especially among pre-policy near-minimum and mixed payers, consistent with the minimum acting as a behavioral reference point (Keys and Wang, 2019; Medina and Negrin, 2022; Katz et al., 2024; Guttman-Kenney, 2026). See Appendix Figure B4 for the distributions of payments.

Appendix Figures B7 and B8 suggest consumers initially increase both spending and payments, with estimates positive but statistically insignificant until Phases IV to V, then decrease both in the long run. The same pattern holds for excess payments, the amount paid above the minimum (bounded at zero if paid the minimum or less), consistent with consumers paying less as they carry less debt and incur lower financing charges.

Finally, we can decompose the effects of Bill 134 on minimum payments into the part driven by changes in the issuer's formula from the part driven by consumers paying down their balances, see Appendix C for the methodological details. Higher required payments accelerate the paydown of balances, which in turn lowers subsequent required minimums;

[10]Estimates for these and other outcomes in this section are in Appendix Figure B6 (monthly) and Appendix Figures B7 and B8 for phased estimates by heterogeneous groups, with accompanying phased estimates for statement balances in column (3) of Appendix Tables B3 to B10. DID phased estimates for statement balances are in Appendix Table B1 column (3) for each policy phase.

we call this feedback the balance channel. During Phase I, the balance channel results in mean minimum payments being \$2.5 lower per month during Phase I than they would otherwise be, offsetting 14% of the increase to minimum payments. By Phase VII, sustained balance paydown causes mean minimum payments to be \$36 per month lower, offsetting 29% of the original increase.

3.3 Causal Effects of Bill 134 on Delinquency, Default, & Credit Scores

A natural cost of higher minimum payments is forcing temporarily liquidity-constrained cardholders into delinquency and default. Figure 3 Panel B shows that Bill 134 significantly increased the likelihood of transitioning into delinquency (having any credit card become 30+ days past due when current the prior month), rising in the first month of phase I and peaking one month later at 0.246 percentage points, increasing by 29% relative to the Quebec baseline mean of 0.84 percentage points.[11]

Figure 5 more clearly shows the effects on transitions into delinquency over the phases of the policy, with estimates reported in Table 4 column (4). The effect is narrow in two respects. First, it is concentrated among pre-policy revolvers (Figure 5 Panel A and Table B3 column (4)). Second, it reflects churn rather than accumulation. The stock of consumers with any delinquency does not rise (Appendix Figure B9), so the elevated transitions come from borrowers who already carried a delinquency repeating, not from new borrowers falling behind. Our long-run DID estimates are not statistically significant (Appendix Table B1 column (4)), so the cycling into and out of 30-day delinquency may not be permanent.

Importantly, we do not find evidence of increases in more severe financial distress in either our SDID or DID approaches. We measure severe financial distress by whether a consumer transitions into being 90+ days past due on any credit card in their portfolio. Table 4 and Figure 6 show results for each phase of the policy, with estimates for the revolving group in Appendix Table B3 column (5). Our DID results even show a significant decline of approximately 0.04 percentage points during Phases IV to VII.

How do our results compare to prior estimates? Castellanos et al. (2026) found that a (large) increase to minimum payments in a field experiment with one issuer in Mexico led to no significant increase in short-run default, but that default rates increased over nine to fourteen months and remained persistent through the end of their sample. Such differences

[11] A temporary spike after nine and ten months may reflect temporary COVID-19 disruptions in delinquency reporting, as there were no changes to minimum payment policies in these months.

make sense given the same institutional differences between Canadian and Mexican credit card markets that we covered in our revolving debt results. Keys and Wang (2019) estimate increases in failure to meet minimum payment requirements of 0.4 percentage points after one month and d'Astous and Shore (2017) find increases in issuer write-offs of 0.04 percentage points after 12 months. Such estimates are in the range of plausible estimates contained in our 95% confidence intervals.

Consistent with finding only short-run delinquency effects from Bill 134, Figure 7 shows the effects on credit scores, a key measure of financial well-being (Gibbs et al., 2025). If consumers were experiencing financial distress through missing payments on non-credit card agreements, this would be reflected by lower credit scores. Panel A suggests little change in credit scores overall, nor by transactors or revolvers, while Panel B reveals that in the latter phases of the policy, credit scores significantly increase for all groups by pre-policy credit score, except subprime where estimates are imprecise. By Phase VII, prime and near prime consumers' average credit scores significantly improve by 12 and 15 points, respectively (Appendix Table B2 Panel E), which are larger in size than removing a bankruptcy flag from a consumer's credit report (e.g., Dobbie et al., 2020).

Overall, we find increases in distress that appear temporary, with consumers adjusting their spending and payment behavior without sliding into more serious arrears. Some of the initial increase in delinquency may reflect some inattentive consumers being surprised by the higher minimum payment. Some groups of consumers appear to experience less financial distress, as proxied by increases in their credit scores.

3.4 Causal Effects of Bill 134 on Credit Limits

We next look at the effect of Bill 134 on credit limits for existing customers. Any credit limit increase in Canada requires borrower consent (Cui and Smith, 2026); issuers can decrease limits without consent but it requires a 30-day notice. Figure 8 presents our SDID estimates for different groups by phase, with estimates in Table 4 column (6). The effect of Bill 134 appears to be a decrease in limits in Quebec relative to Canada, although the confidence intervals tend to span zero, with this conclusion robust to our DID estimation (Appendix Table B1). By Phase VII, we can, however, rule out the policy leading to economically meaningful increases in credit limits for any group, and there are significant reductions in limits for consumers with subprime or prime credit scores, and for exact- or near-minimum payers.

The muted aggregate effect masks a composition shift that is visible once we exploit the portfolio data. Appendix Figure B10 restricts attention to cards opened before August

2019 and shows a clear decline in limits on these pre-policy cards for every group except superprime consumers. Yet the effect on a consumer's total limits across all cards (Figure 8 Panel A) is much weaker. The two facts reconcile only if non-superprime consumers open new cards that partly refill the credit lost on their pre-policy cards. This substitution is why the headline limit effect is noisy rather than large, and it can only be seen by observing the full portfolio of cards a consumer holds rather than any single account.

To evaluate how much the policy constrains consumers, we study its effect on the credit card utilization rate (the sum of statement balances divided by the sum of credit limits). Because debt responds to credit limits even for consumers far from their limits (Gross and Souleles, 2002; Agarwal et al., 2018, 2025; Aydin, 2022), part of any deleveraging could in principle reflect the contraction in limits rather than the payment response; utilization is the diagnostic that separates them. A constrained consumer whose credit limit is cut would be expected to have their utilization rate increase. By phase VII, we find that subprime consumers' utilization rates significantly increase by 7 percentage points, consistent with constraints. In contrast, consumers overall and across all other heterogeneous groups experience no change or significant decreases, inconsistent with binding constraints, and helping to understand credit score improvements for some groups. These results are in Appendix Table B11.

Our credit limit estimate could be biased if issuers respond to Bill 134 by reallocating credit from Quebec to the rest of Canada by, for example, redeploying balance-sheet capacity previously absorbed by Quebec lending. Such reallocation would overstate the Quebec-specific decline, since it would show up as rising limits elsewhere against which the Quebec fall is measured. Empirically, we see no evidence of this. Credit limits outside Quebec increase in parallel with one another post-policy, while Quebec limits also increase, but at a slower rate (Figure B1 Panel L). The absence of an offsetting increase outside Quebec is what rules out the redeployment story, consistent with issuers optimizing limits borrower-by-borrower rather than at the province level.

Finally, the credit limit margin also bears on the design of other credit-access policies. Ability-to-pay rules, in particular, may inefficiently restrict limits, and appear difficult to calibrate: in the U.S. credit card market they have no detectable effect on outcomes and so produce mainly compliance costs (Fulford and Stavins, 2024), whereas in the mortgage market they substantially restrict access (DeFusco et al., 2020).

4 Credit Supply

This section presents our results for the effects of the Quebec minimum payment policy on new credit card accounts opened each month. All eleven issuers tightened their minimum payment policies in Quebec to 5% in August 2019—the lowest allowable minimum payment level—and did not change this again over our sample period. During this time, all these issuers left their policies unchanged in the rest of Canada. We then present a model of credit card supply to understand the responses of issuers.

4.1 New Card Openings

We apply our SDID methodology to study the effects of the policy on new card openings. We examine four outcomes: (i) new cards opened per 100 consumers, (ii) total value of the credit card limits on these new cards per 100 consumers, and for these newly opened cards (iii) their mean limit, and (iv) their mean credit score (measured the month before card opening). Table 5 presents the results for each phase of the policy. There are no pre-trends, and the monthly SDID estimates are consistent with these phased estimates, as shown in Appendix Figure B6 Panels J, K, and L.

Table 5 column (1) shows a significant and persistent decline in the number of new cards opened in Quebec relative to other provinces; column (2) shows the total credit available on new cards declining in the later phases of Bill 134; and column (3) shows that in the middle phases, credit limits on the cards actually issued in Quebec increased. The decline in the number of new cards is large—on average, a 15.7% decline relative to the baseline—and it dominates the aggregate: total new credit falls once the count effect outweighs the higher average limit. Column (4) provides suggestive evidence that the credit scores of new cards opened may be increasing across policy phases, though this is not statistically significant from zero.

The increase in the average limit among issued cards is a compositional effect: it reflects a safer pool of approved applicants, not higher limits for any given borrower. This is consistent with issuers opening cards for less risky consumers and rationing riskier ones. Since new card openings declined after the policy even as pre-policy cardholders partially offset limit cuts on their pre-policy cards by opening new cards (Section 3.4), the decline in new card openings must have been concentrated among consumers without pre-policy cards. We interpret the reduction in new cards as supply- rather than demand-driven for two reasons. First, minimum payments are a non-salient contract term at the point of application, in contrast to interest rates, credit limits, and rewards, so they are unlikely to drive a demand response of this magnitude. Second, the credit card offer data in Section 4.2

show issuers actively shifting toward retention offers and pre-deadline generosity in Quebec, a direct supply-side response that a demand-side account cannot generate.

4.2 Credit Card Offers

Here, we take advantage of credit card offers, collected by Mintel Comperemedia for a panel of Canadian households, to investigate the supply of cards in the market. Figure 9 plots SDID estimates for the effects on card offers between 2018 and 2020. Panel A shows some evidence of a temporary increase in offers (indexed to 100 in August 2018) in Quebec relative to other provinces, just before the first phase of the policy. Four months before the policy is implemented, the number of offers increased by 156%.

The largest difference between Quebec and the other provinces is in the type of offers just before August 2019. Figure 9 Panel B shows that in Quebec, the offers immediately before the first phase of the policy are significantly more likely to be for retention rather than for acquiring new customers, compared to other provinces. In the Quebec baseline, only 19.7% of offers are for retention. One month before phase one of the policy, there is a substantial increase of 39.4 percentage points. In our sample, retentions are largely offers to upgrade an existing card for a loyal customer.

Just prior to the policy coming into effect, consumers in Quebec also temporarily receive offers with more favorable contract terms. They receive offers with lower interest rates (Panel C, 12.8% lower rates three months before Phase I), lower annual fees (Panel D, 50% lower fees three months before Phase I), and higher credit limits (Panel E, 47% increase three months before Phase I). Post-August 2019, we see no significant differences, except for a small and temporary increase in interest rates on offers that dissipates within six months. We interpret this evidence as consistent with issuers trying to stay, or become, top of wallet for their existing consumers.[12] Doing so ensures that such consumers continue using cards that have a minimum payment requirement lower than the 5% required for cards activated post-August 2019.

4.3 A Model of Issuers

In this section, we present a model of credit card supply designed to organize two empirical findings: (i) the reduction in credit limits following the imposition of minimum payment requirements, (ii) the heterogeneous bank responses in Table 1, where some issuers set min-

[12] Gelman and Roussanov (2024) show that giving a consumer a new card, even with the same features, can shift spending toward the new card without a corresponding reduction on their others, consistent with consumers treating payment methods as non-fungible mental accounts.

imum payments strictly above the regulatory floor in Quebec while leaving their formulas unchanged in the rest of Canada.

An important caveat is that we treat banks as price-takers in interest rates, abstracting from market power. The model is intended both to organize empirical patterns, and to highlight a supply-side adjustment in our consumer welfare calculations. Our model complements the limited prior theoretical work on minimum payments. Castellanos et al. (2026) show that the effects of increasing minimum payments on debt and default are ambiguous; however, they do not allow for supply-side responses. Katz et al. (2024) model why issuers optimally set minimum payments at "low" levels. More broadly, our treatment of the credit limit as the bank's principal choice margin, with interest rates taken as given, follows Agarwal et al. (2018) and more recent work by Matcham (2025), who structurally models risk-based credit limits under adverse selection in markets where issuers individualize limits rather than prices.

4.3.1 Environment

Agents. There are J banks indexed by $j \in \{1, \dots, J\}$, and a continuum of borrowers with types $\theta \in [0, 1]$, where higher θ denotes greater creditworthiness. Bank j's customer base is drawn from distribution $F_j(\theta)$.

Timing and Regulation. There are three periods, $t \in \{1, 2, 3\}$. For expositional simplicity, assume that in period 1 (status quo), every issuer in every Canadian province uses the same minimum payment formula:

$$m_j^{SQ}(B) = \$10 + \text{interest} + \text{fees}, \tag{7}$$

where B is the balance. In period 2 (Phase I), Quebec introduces Bill 134, requiring that minimum payments be at least $\bar{m}_1$ percent of the balance ($\bar{m}_1 = 2\%$). The rest of Canada faces no regulation. In period 3 (terminal phase), the Quebec floor tightens to $\bar{m}_T = 5\%$ of balance. The entire regulatory schedule is announced before period 2 and is known to all issuers.

4.3.2 Borrower Behavior

A borrower of type θ with credit limit L and minimum payment rate m carries revolving debt:

$$D(\theta, m, L) = \alpha(\theta)(1 - m)L, \tag{8}$$

where $\alpha(\theta) \in [0, 1]$ is the utilization rate, with $\alpha'(\theta) < 0$. Transactors (high-θ types) have $\alpha(\theta) \approx 0$.[13]

Default probability. We specify the default probability as follows:

$$p(\theta, m) = \bar{p}(\theta) + \chi \cdot H\big(m - \psi(\theta)\big), \qquad H(x) \equiv \mathbb{E}_\varepsilon\big[(x - \varepsilon)^+\big], \tag{9}$$

where $\bar{p}(\theta)$ is the baseline default probability ($\bar{p}'(\theta) < 0$), $\psi(\theta)$ is the maximum share of the balance that type θ can afford to repay each month ($\psi'(\theta) > 0$), $\chi > 0$ governs default sensitivity to liquidity stress, and ε is a mean-zero shock to this affordable rate with full support on $\mathbb{R}$. The function H is smooth, strictly increasing, and convex, with $H(x) > 0$ for all x. The specification captures two empirical regularities: baseline default rates decline with creditworthiness, and default risk rises when minimum payments approach or exceed a borrower's expected payment capacity (d'Astous and Shore, 2017; Castellanos et al., 2026).

4.3.3 Bank Profit and Optimal Credit Limits

Bank j earns per-period profit from borrower θ with credit limit L:

$$\pi(\theta, m, L) = \underbrace{\pi_0 \cdot L}_{\text{Interchange revenue}} + \underbrace{(r - c) \cdot \alpha(\theta)(1 - m)L}_{\text{Net interest margin}} - \underbrace{p(\theta, m) \cdot \lambda L}_{\text{Expected default losses}}, \tag{10}$$

where $\pi_0 > 0$ is per-dollar interchange revenue, r is the interest rate, c is the cost of funds, and $\lambda \in (0, 1)$ is the loss given default. Extending credit limit L to borrower θ also incurs a convex cost $(\kappa/2)L^2$, capturing capital requirements and risk management. The bank chooses L to maximize $\pi(\theta, m, L) - (\kappa/2)L^2$.

Define the net margin per dollar of credit extended as:

$$N(\theta, m) \equiv \pi_0 + (r - c)\alpha(\theta)(1 - m) - p(\theta, m)\lambda. \tag{11}$$

[13] The utilization rate in this model is the revolving debt divided by the credit limit, as opposed to the utilization rate calculated by statement balances divided by credit limits as presented in Section 3.4 and as a key input to credit scores. More generally, utilization may itself respond to the minimum payment rate: $\alpha(\theta, m)$ with $\partial\alpha/\partial m \leq 0$. Borrowers may voluntarily reduce utilization when required payments increase, through reference-dependence, attention effects, or precautionary saving. Empirically, we find in Section 3.2 that revolving debt falls by more than the mechanical effect of higher m, consistent with $\partial\alpha/\partial m < 0$. All results in this section hold with this extension; the behavioral response amplifies the effects of the regulation on bank profit and credit supply without qualitatively changing the comparative statics.

Then $\pi(\theta, m, L) = N(\theta, m) \cdot L$, and the first-order condition with respect to L yields:

$$L_j^*(\theta, m) = \frac{N(\theta, m)}{\kappa}, \qquad v(\theta, m) \equiv \frac{[N(\theta, m)]^2}{2\kappa}. \tag{12}$$

The bank serves borrower θ if and only if $N(\theta, m) \geq 0$. This defines a cutoff type $\bar{\theta}(m)$ such that borrowers with $\theta < \bar{\theta}(m)$ are denied credit. Transactors are always served since $\alpha(\theta)$ and $p(\theta, m)$ are approximately zero for high θ.

Status quo. Bank j's aggregate profit is $\Pi_j(m) = \int_{\bar{\theta}(m)}^{1} \frac{[N(\theta,m)]^2}{2\kappa} \, dF_j(\theta)$. Low minimum payments maximize the stock of interest-bearing revolving debt. The status quo rate m^{SQ} is profit-maximizing: $\Pi_j(m^{SQ}) \geq \Pi_j(m)$ for all $m > m^{SQ}$. At $t = 1$, this yields a uniform national minimum.

4.3.4 Results

Credit limit reduction. When Quebec's regulation forces m above m^{SQ} at $t = 2$, credit supply contracts through two channels. First is credit rationing. Totally differentiating $N(\bar{\theta}, m)$ gives $d\bar{\theta}/dm = -(\partial N/\partial m)/(\partial N/\partial \theta)$. The denominator is positive because the default-reduction dominates lost-interest as θ rises, otherwise the cutoff is not well-defined. The numerator is negative as N falls with m both via lost interest margin and via increased default risk for borrowers near payment capacity. Hence, $d\bar{\theta}/dm > 0$. The second channel is a general decline in credit limits. From eq. (12), $\partial L_j^*/\partial m < 0$. That is, credit limits fall for all continuing borrowers when minimum payments rise above the status quo.[14]

Over-compliance. At $t = 2$, why do some banks set their Quebec minimum payment strictly above 2%, while retaining the status quo formula in the rest of Canada?

Assumption 1 *Each time bank j changes its minimum payment formula in a given jurisdiction, it incurs a fixed cost $K_j > 0$. This cost varies across banks to capture differences in IT modifications, testing, customer communications, regulatory filings, and retraining.*

Assumption 1 is motivated by interviews with bank lending officers, who claim that the fixed costs associated with changing minimum requirements every August were substantial.

[14] The size of this effect depends on θ. Transactors, who are concentrated in the superprime credit score group, are largely unaffected since both $\alpha(\theta)$ and $\partial p/\partial m$ are negligible for these borrowers. For revolvers, both the interest-margin and default-risk channels are active, and credit limits decline. Consistent with this transactor-versus-revolver distinction, the empirical heterogeneity in Section 3 shows that credit limits of superprime consumers are unchanged while limits of non-superprime consumers decline. The model's monotone prediction within revolvers is harder to verify, as subprime estimates are imprecise.

At $t = 2$, the regulation forces issuers using the status quo formula in eq. (7) to switch to a percentage-of-balance rule in Quebec. The first menu cost K_j is unavoidable. The bank also knows that the floor will tighten to $\bar{m}_T = 5\%$ at $t = 3$. The question is whether to comply minimally at $\bar{m}_1 = 2\%$ now and pay K_j again at $t = 3$, or jump directly to $\bar{m}_T$ at $t = 2$ and avoid the second menu cost. The bank's problem at $t = 2$ in Quebec is:

$$V_j^{QC} = \max_{m_j \in \{\bar{m}_1, \bar{m}_T\}} \Big\{ \Pi_j(m_j) - K_j \; + \; \beta \big[\Pi_j(\bar{m}_T) - K_j \cdot \mathbf{1}\{m_j \neq \bar{m}_T\} \big] \Big\}. \tag{13}$$

At t=2, comparing minimal compliance (strategy A) to over-compliance (strategy B) yields:

$$V_j^B - V_j^A = -\big[\Pi_j(\bar{m}_1) - \Pi_j(\bar{m}_T)\big] + \beta K_j. \tag{14}$$

At $t = 2$, bank j jumps to $\bar{m}_T$ in Quebec if and only if

$$\beta K_j \; > \; \Pi_j(\bar{m}_1) - \Pi_j(\bar{m}_T), \tag{15}$$

i.e., when the discounted menu cost it saves at $t = 3$ exceeds the profit forgone from setting a rate above the current floor at $t = 2$.

Condition (15) generates heterogeneous responses through variation in K_j. Issuers with low K_j comply at the floor; those with high K_j jump to $\bar{m}_T$. In practice, several issuers chose intermediate rates (2.5% or 3%) at Phase I rather than the terminal 5%, which the three-period model abstracts from, though condition (15) captures the same incentive.[15]

The default channel. A natural concern is that higher minimums raise default among liquidity-constrained borrowers. The regulation has two opposing effects on equilibrium default: every served borrower faces a higher default probability ($\partial p / \partial m > 0$), while the cutoff $\bar{\theta}(m)$ rises so the highest-risk borrowers are rationed out. The net sign depends on F, the curvature of H, and the variance of ε. Empirically, average defaults are approximately unchanged, consistent with the two margins offsetting.

[15] The model has implications for which banks over-comply. Transactors are insensitive to m (since $\alpha(\theta) \approx 0$), so banks with more transactors also face a smaller $\Pi_j(\bar{m}_1) - \Pi_j(\bar{m}_T)$ and should be more likely to over-comply. Table B12 reports sample means across card issuers. Over-compliers have a higher transactor share and lower revolving debt, consistent with this composition channel, but because transactor share and issuer size are highly correlated among the affected banks, the pure composition channel is difficult to isolate in this cross-section.

5 Welfare

5.1 Implications of Bill 134 for Credit Card Issuers

Our results documenting consumer and supply responses to Bill 134 have implications for credit card issuers' revenue. In Table 6, we report back-of-the-envelope lost and gained revenue from our documented long-run decline in revolving debt as a result of Bill 134.

First, the reduction in revolving credit card debt translates into a meaningful decrease in interest revenue. Given a typical credit card interest rate of approximately 20%, a 25.8% decline in revolving debt implies that Bill 134 reduced interest revenue for credit card issuers by $721.1 million in Quebec.

Second, in contrast to lost interest revenue, issuers might be expected to have generated increased revenue from late fees arising from increased delinquencies. Given a typical late fee of $30, Quebec issuers could be receiving an additional $3.8 million on an annualized basis by the end of the policy; an amount far too small to offset the lost interest revenue.

5.2 Consumer Welfare Implications of Bill 134

Our reduced-form results establish that Bill 134 reduces revolving debt, raises delinquency transitions without raising defaults, and contracts credit access. Whether the net effect improves welfare depends, as Campbell (2016) emphasizes, on whether the borrowing that the policy unwinds reflects a behavioral mistake or a rational consumption-smoothing choice. Three findings reject the rational-optimizing benchmark: borrowers whose budget sets are unchanged by the mandate nonetheless deleverage; the deleveraging begins before credit limits contract, so it is not supply-driven; and it produces no persistent distress, so it is not a symptom of binding constraints.

We therefore evaluate the policy with a behavioral sufficient statistics approach (Chetty, 2009; Bernheim and Taubinsky, 2018; Allcott et al., 2025; Choukhmane and Palmer, 2026). The closest antecedent in consumer credit is the payday lending evaluation of Allcott et al. (2022). Our setting departs from theirs chiefly in that credit supply responds to the policy, which we build into the accounting below. Our approach is agnostic to the behavioral mechanism that shifts debt (e.g., reference-dependent preferences, anchoring, satisficing); present bias is what *prices* each dollar moved. Present bias among credit cardholders is well documented (Meier and Sprenger, 2010; Kuchler and Pagel, 2021; Lee and Maxted, 2026). We evaluate welfare using the long-run self as our criterion, while acknowledging that the choice of welfare criterion for time-inconsistent agents is contested (Bernheim and Taubinsky, 2018; Ericson and Laibson, 2019). We summarize our approach here, with details in Appendix D.

We define γ as the long-run self's dollar loss from the last dollar of revolving debt:

$$\gamma \; = \; (1-\beta)\,\delta(1+r)\left(\frac{c_2}{c_1}\right)^{-\sigma} \; \approx \; 1-\beta, \tag{16}$$

with quasi-hyperbolic preferences (β, δ), revolving interest rate r, and risk aversion σ. The approximation evaluates the marginal-utility ratio at observed consumption and market prices, $\delta(1+r)(c_2/c_1)^{-\sigma} \approx 1$. Substituting the frictionless decision-self Euler equation instead gives $\gamma = (1-\beta)/\beta$, raising each threshold by the factor $1/\beta$—nearly doubling the focal estimates—so $\gamma \approx 1-\beta$ is conservative. We rely on external estimates of β from the literature as an internal calibration would confound time preferences with the strength of the behavioral mechanism that shifts debt.

Our approach evaluates the break-even point where the cost of loss of credit access would leave overall welfare unchanged. We calculate this across consumer types, θ, where $\phi(\theta)$ is the size of each type. The benefit is measured only for the revolving pre-policy payer types (near-minimum, mixed), who appear unconstrained given how they react to the policy. All payer types (exact min., near-minimum, mixed, full) enter through the access cost. The per-consumer welfare change (ΔW) and the break-even access cost (Λ^{be}) are:

$$\Delta W = \sum_{\theta} \gamma\left(-\Delta D^{\text{bias}}(\theta)\right)\phi(\theta) - \Lambda, \qquad \Lambda^{be} = \sum_{\theta} \gamma\left(-\Delta D^{\text{bias}}(\theta)\right)\phi(\theta), \tag{17}$$

where $\Delta D^{\text{bias}}(\theta)$ is the Phase VII debt response net of the response to the concurrent credit-limit cut, computed with the marginal propensity to borrow implied by the Section 4.3 borrowing rule, $\partial D/\partial L = \alpha(\theta)(1-\bar{m}_T) \approx 0.43$–$0.58$ (α is from baseline revolving debt utilization). Netting out the credit limit component matters because it reassigns the surplus lost to the credit-limit contraction to the access cost Λ. We obtain similar results using an external quasi-experimental marginal propensity to borrow from Agarwal et al. (2018) instead of the model borrowing rule. Both supply-side adjustments are, if anything, conservative. A limit cut forces deleveraging only where the limit binds, and it rarely does: pre-policy utilization averages 30% and the policy leaves it unchanged or reduces it for some types (Appendix Table B11), so the cuts only pushed subprime consumers toward their limits. The response we net out is therefore primarily precautionary paydown to restore unused credit, which declines with distance from the limit (Gross and Souleles, 2002; Aydin, 2022), and so our adjustment likely understates the break-even cost.

Result. Table 7 reports break-even access costs for the three structural estimates of β in the literature. At a mean Quebec household consumption level of $65,344 (Statistics Canada, 2025) and $\sigma = 2$, column (1) shows the break-even cost without the supply correction ranges from $56 (per consumer in Quebec, not per consumer who loses access) at the highest β to $148 at the lowest, or $327 million to $863 million aggregated over Quebec's 5.8 million cardholders. Netting out the supply-driven debt response to the concurrent credit-limit cut in columns (2) and (3) lowers these per consumer break-even thresholds to between $16 and $54, because part of the observed deleveraging is then reassigned to the access cost rather than counted as an internality benefit. Since the rationed cards are marginal, we regard even the corrected threshold as a high bar and conclude that Bill 134 is welfare-improving under the behavioral criterion across the structural range of β.

Robustness. Our conclusions do not turn on how we obtain β. An internal calibration that backs the bias out of the unconstrained groups' own deleveraging (explained in Appendix D), rather than importing β from the literature, puts the break-even at the lower end of our main estimates (Appendix D.4). Break-even costs increase if we also allow non-zero internality benefits for additional payer types (Appendix D.5). Incorporating additional behavioral biases—naivete (Heidhues and Kőszegi, 2010; Allcott et al., 2022) or exponential growth bias (Stango and Zinman, 2009)—may raise the internality per dollar above $1 - \beta$, so our break-even thresholds may be underestimates.

6 Conclusions

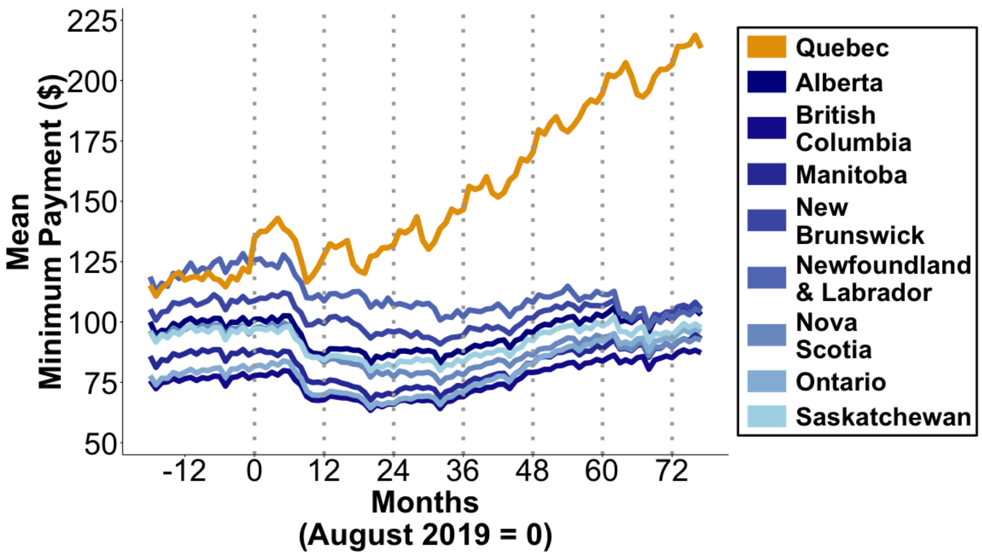
We evaluate a hard paternalistic policy that tightened credit card minimum payments in Quebec to 5% of the balance while leaving them unchanged in the rest of Canada. Using a synthetic difference-in-differences design on comprehensive consumer credit reporting data, we find that the policy persistently reduced revolving debt, at the cost of more transitions into delinquency (but not default), and a contraction in credit access, especially among new cards.

Consumers persistently reduce their debt by more than can be explained by simply increasing their payments to meet the higher minimum payment requirements. Debt reduction occurs among groups of consumers prior literature has classified as being behavioral based on their payment behaviors (Keys and Wang, 2019; Gathergood et al., 2019; Agarwal et al., 2026a). Such behavior is difficult to reconcile with standard preferences or liquidity constraints, and appears consistent with the minimum payment operating as a behavioral reference point. Embedding issuers' supply-side response into a sufficient statistics welfare framework, we estimate that the policy is welfare-improving so long as the cost of lost credit access does not exceed \$16 to \$54 per Quebec consumer.

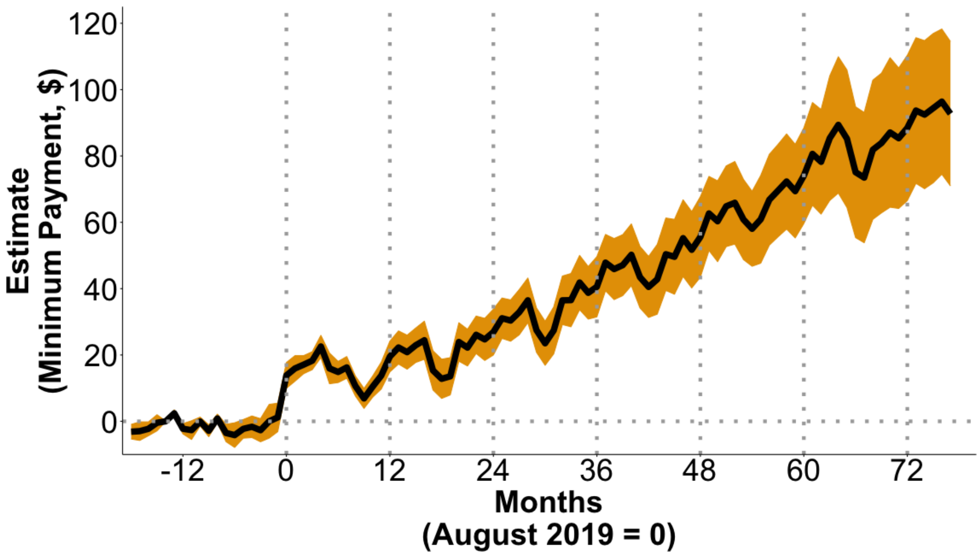
Our results speak to the design of consumer financial protection more broadly. Unlike interest rate caps, which tend to systematically exclude the highest-risk borrowers from the market (Cuesta and Sepúlveda, 2021), a minimum-payment floor targets the unconstrained borrower who over-borrows while preserving the ability of liquidity-constrained borrowers to continue revolving. Because Quebec moved from minimums below those of the U.S. and U.K. to well above them, our estimates are informative for whether comparable tightening would be welfare-improving in other developed credit card markets.

Figure 1: Credit card minimum payments

A. Unconditional means of minimum payments by province



B. Synthetic difference-in-differences estimates for the effects of the Quebec policy on minimum payments



Notes: Data source is TransUnion. Month 0 is August 2019 when the first phase of the Quebec policy occurs, requiring minimum payments of at least 2% of the balance. Panel A shows unconditional means of consumer's credit card minimum payments, measured in Canadian dollars, for each Canadian province, each month. Panel B presents the estimated dynamic effects on this same minimum payment outcome for τ months after the policy began, the δ_τ estimates calculated in Equation 3 using our SDID specification in Equation 2. Months -13 to -18 are used to construct the synthetic control. In Panel B, standard errors are calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021), with error bars showing 95% confidence intervals. Dashed vertical lines mark the start of each policy phase, which raise the requirement by 50 basis points each August from 2% in 2019 (Phase I) to 5% in 2025 (Phase VII). Sample: credit cards held by 24.4 million Canadian consumers over 97 months.

Figure 2: Quebec credit card minimum payment policy

Minimum Payment

Every month, you have to reimburse the amount that appears on your credit card statement, or a part of that amount.

If you only reimburse part of the balance, you have to pay the "minimum payment" or "minimum instalment." The way to determine this amount is indicated in the contract, generally expressed as a percentage of the balance owing.

Amount of the minimum payment

The *Consumer Protection Act* provides for the minimum payment percentage you can be charged.

Contract entered into on or after August 1, 2019

If you entered into a credit card contract on or after August 1, 2019, the minimum payment to be made every month must correspond to **at least 5%** of the balance owing indicated on your account statement.

Contract entered into before August 1, 2019

If you already had a credit card before August 1, 2019 and the minimum payment percentage was set at less than 2%, **for the period from August 1, 2019 to July 31, 2020**, the minimum payment to be made every month must correspond to **2%** of the balance owing indicated on your account statement.

What if the issuer of your credit card claims more than 2%?

- They may do so if the contract already provided for that possibility.
- They may not do so if they amended the contract so as to charge more than 2% without your consent.

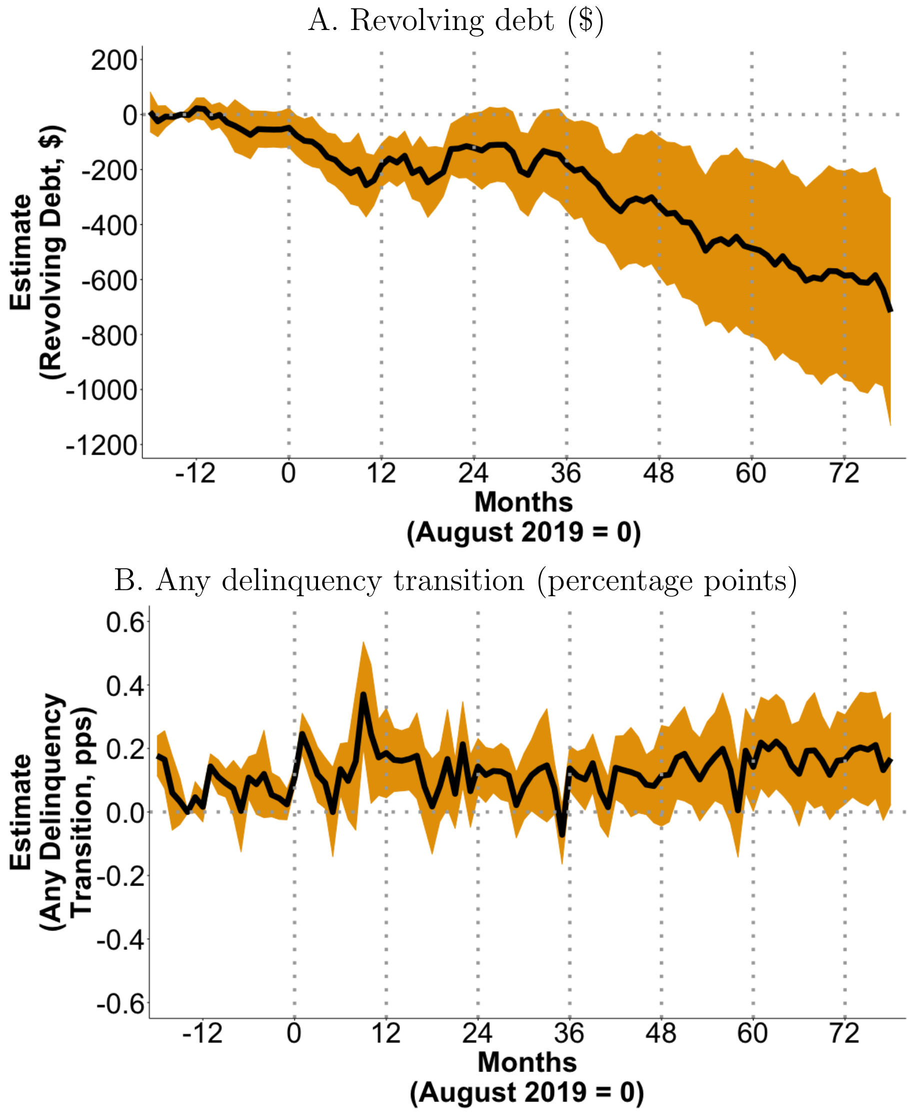
Over the coming years, the minimum payment percentage will increase. Credit card issuers will have to charge a minimum payment that corresponds to at least the following percentage of the balance owing:

- 2.5%, as of August 1, 2020;
- 3%, as of August 1, 2021;
- 3.5%, as of August 1, 2022;
- 4%, as of August 1, 2023;
- 4.5%, as of August 1, 2024;
- 5%, as of August 1, 2025.

If the credit card issuer charges you a percentage that is higher than what is provided for in the contract or by the Act, contact the Office de la protection du consommateur.

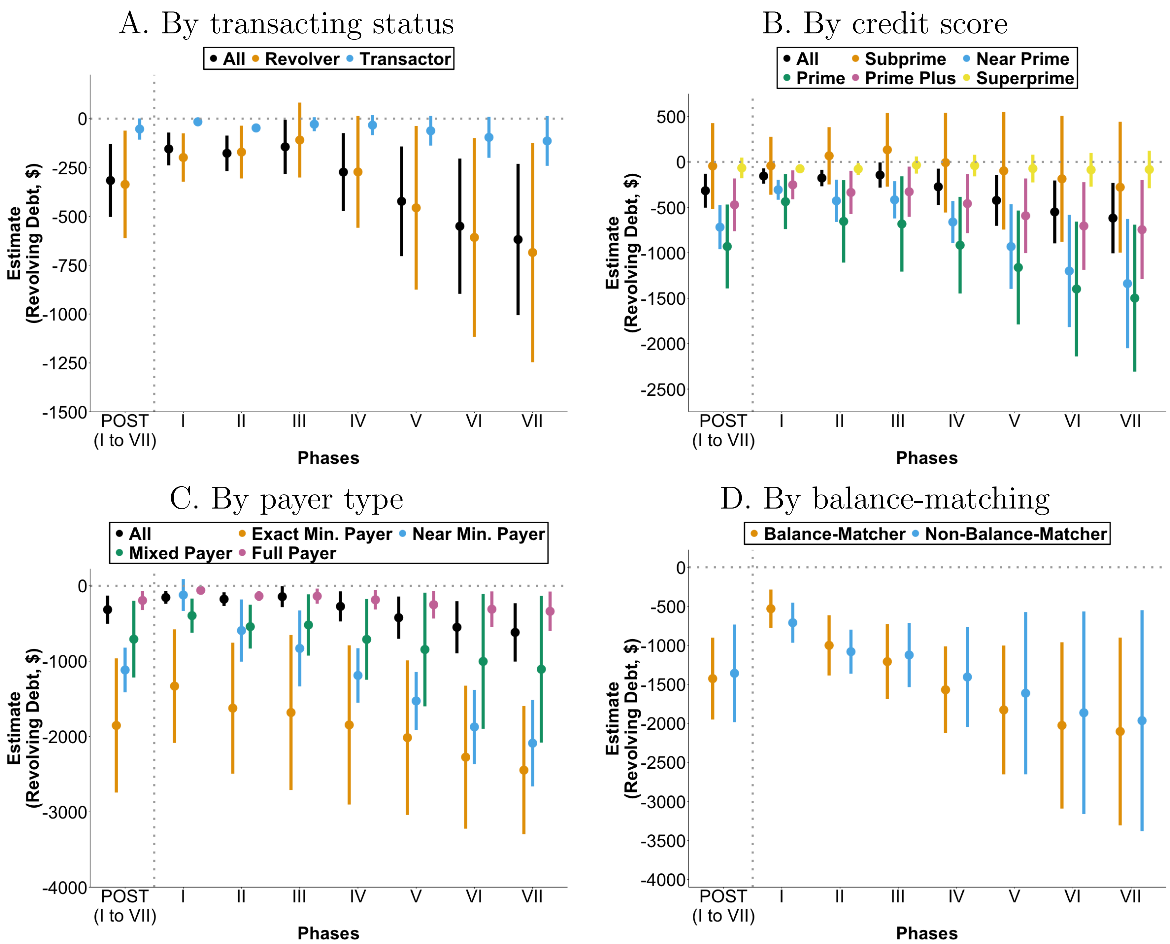
Notes: Data source is Québec Office de la Protection du Consommateur.

Figure 3: Effects of the policy on revolving debt and delinquency transitions



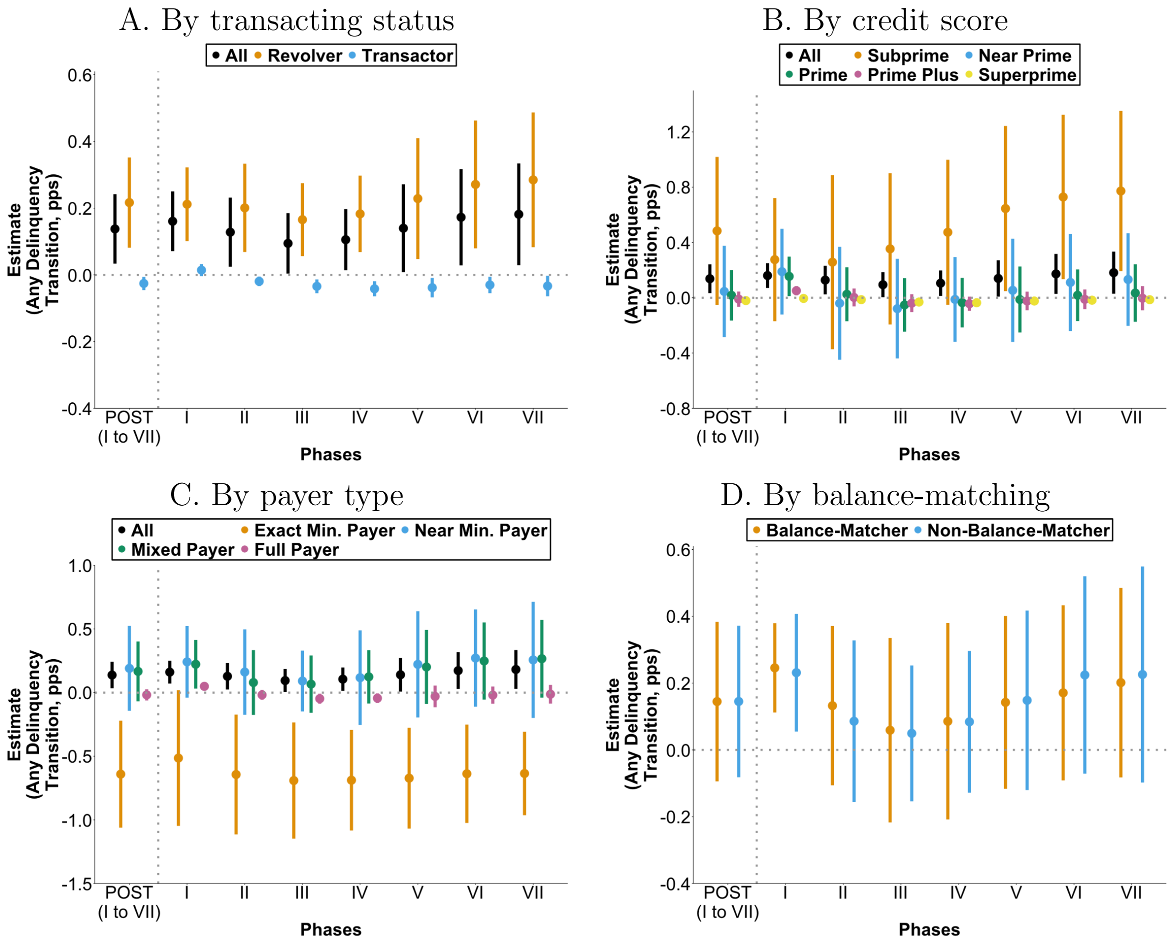
Notes: Data source is TransUnion. Each panel presents the estimated dynamic effects for a different outcome for τ months after the Quebec policy began, the δ_τ estimates calculated from Equation 3 using our SDID specification in Equation 2. The outcome in Panel A is a consumer's total credit card revolving debt, measured in Canadian dollars. The outcome in Panel B is percentage points (pps) of "Any Delinquency Transition": a binary variable that takes a value of one if any of a consumer's credit card accounts transitions from being current in the previous month to being 30 or more days past due in this month. Months -13 to -18 are used to construct the synthetic control. Standard errors are calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021), with error bars showing 95% confidence intervals. Dashed vertical lines mark the start of each policy phase, which raise the requirement by 50 basis points each August from 2% in 2019 (Phase I) to 5% in 2025 (Phase VII). Sample: credit cards held by 24.4 million Canadian consumers over 97 months.

Figure 4: Heterogeneous effects of the policy on revolving debt



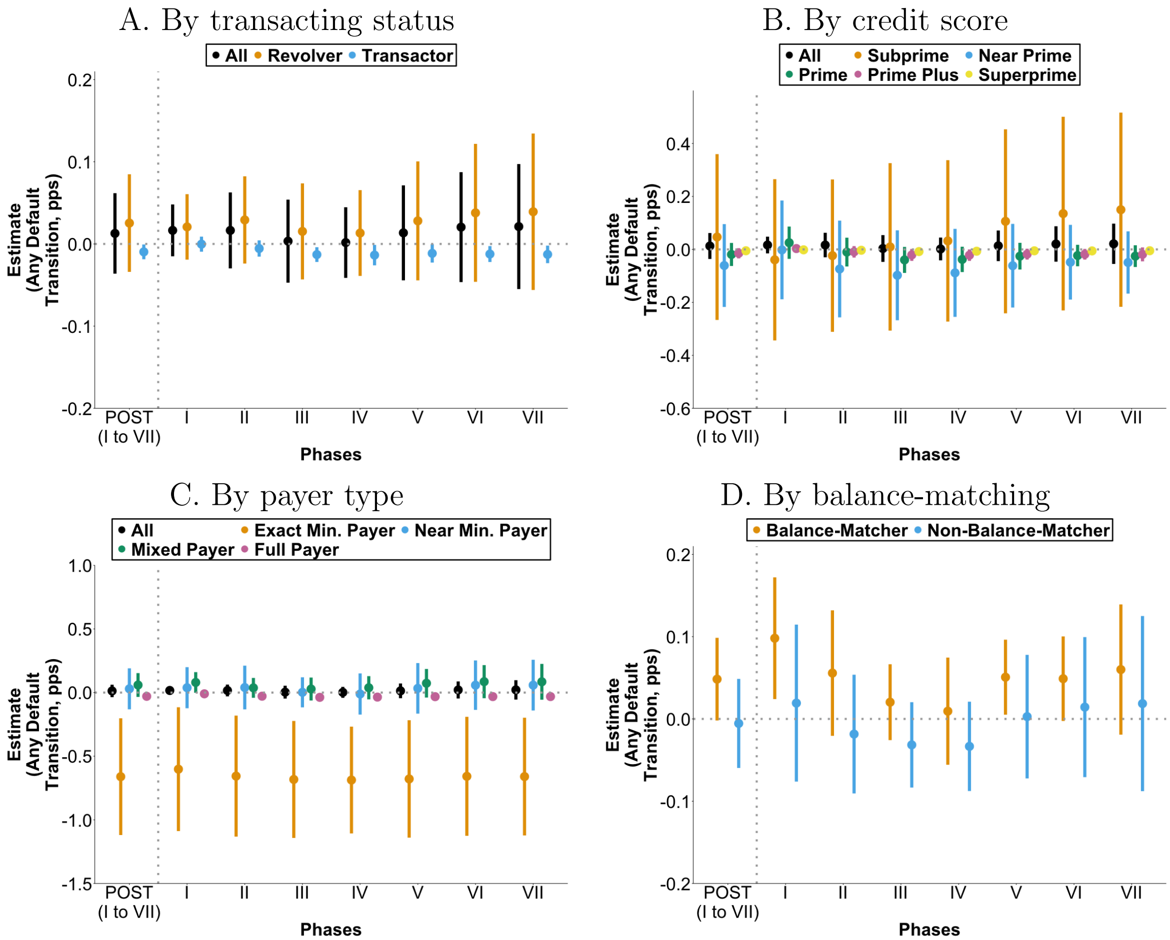
Notes: Data source is TransUnion. This figure presents the estimated effects on a consumer's credit card revolving debt amount (measured in Canadian dollars) based on our synthetic difference-in-differences (SDID) specification in Equation 2. In each panel, the first set of estimates, labeled "POST (I to VII)," show the effects of the policy pooled across Phases I to VII of the policy. The next set of estimates show the effects for each phase j of the policy, the δ_j^{PHASE}. In all panels, the estimates in black show the average estimates, with other colors showing estimates for heterogeneous cuts. Each panel shows a different heterogeneous cut of the data, and different colors within a panel denote the cuts. All heterogeneous cuts are calculated before policy Phase I. Panel A shows effects by whether a consumer is classified as a transactor or a revolver. Panel B shows effects by a consumer's TransUnion credit score. Panel C shows effects by a consumer's payment behavior. Panel D shows effects by whether a consumer is classified as making payments across cards proportionally to their balance ("balance-matching heuristic"). Standard errors are calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021), with error bars showing 95% confidence intervals. Sample: credit cards held by 24.4 million Canadian consumers over 97 months.

Figure 5: Heterogeneous effects of the policy on delinquency transitions



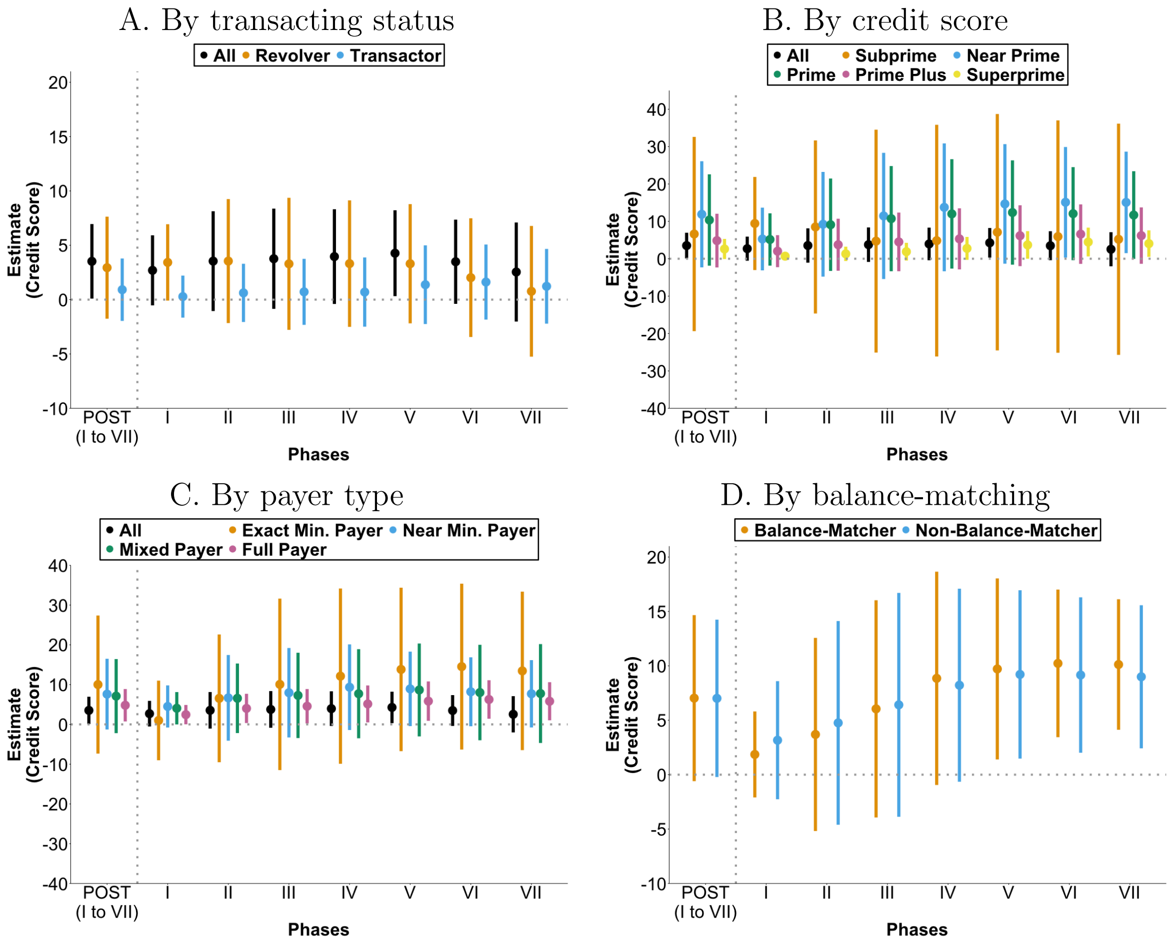
Notes: Data source is TransUnion. This figure presents the estimated effects on a consumer having any credit card account that transitions into delinquency that month (defined as any account becoming 30+ days past due, measured in percentage points) based on our synthetic difference-in-differences (SDID) specification in Equation 2. In each panel, the first set of estimates, labeled "POST (I to VII)," show the effects of the policy pooled across Phases I to VII of the policy. The next set of estimates show the effects for each phase j of the policy, the δ_j^{PHASE}. In all panels, the estimates in black show the average estimates, with other colors showing estimates for heterogeneous cuts. Each panel shows a different heterogeneous cut of the data, and different colors within a panel denote the cuts. All heterogeneous cuts are calculated before policy Phase I. Panel A shows effects by whether a consumer is classified as a transactor or a revolver. Panel B shows effects by a consumer's TransUnion credit score. Panel C shows effects by a consumer's payment behavior. Panel D shows effects by whether a consumer is classified as making payments across cards proportionally to their balance ("balance-matching heuristic"). All heterogeneous cuts are calculated before the first phase of the policy. Standard errors are calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021), with error bars showing 95% confidence intervals. Sample: credit cards held by 24.4 million Canadian consumers over 97 months.

Figure 6: Heterogeneous effects of the policy on default transitions



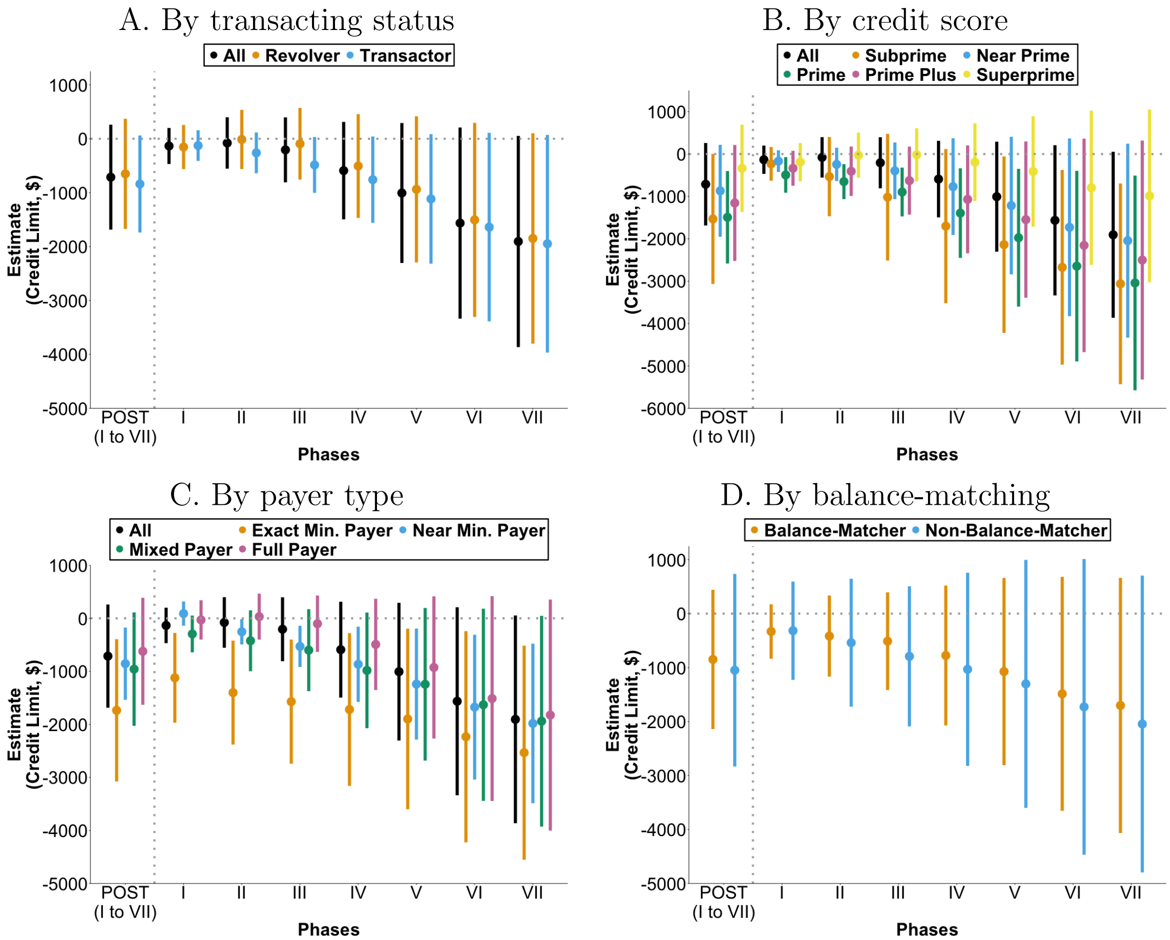
Notes: Data source is TransUnion. This figure presents the estimated effects on a consumer having any credit card account that transitions into default that month (defined as any account becoming 90+ days past due, measured in percentage points) based on our synthetic difference-in-differences (SDID) specification in Equation 2. In each panel, the first set of estimates, labeled "POST (I to VII)," show the effects of the policy pooled across Phases I to VII of the policy. The next set of estimates show the effects for each phase j of the policy, the δ_j^{PHASE}. In all panels, the estimates in black show the average estimates, with other colors showing estimates for heterogeneous cuts. Each panel shows a different heterogeneous cut of the data, and different colors within a panel denote the cuts. All heterogeneous cuts are calculated before policy Phase I. Panel A shows effects by whether a consumer is classified as a transactor or a revolver. Panel B shows effects by a consumer's TransUnion credit score. Panel C shows effects by a consumer's payment behavior. Panel D shows effects by whether a consumer is classified as making payments across cards proportionally to their balance ("balance-matching heuristic"). Standard errors are calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021), with error bars showing 95% confidence intervals. Sample: credit cards held by 24.4 million Canadian consumers over 97 months.

Figure 7: Heterogeneous effects of the policy on credit scores



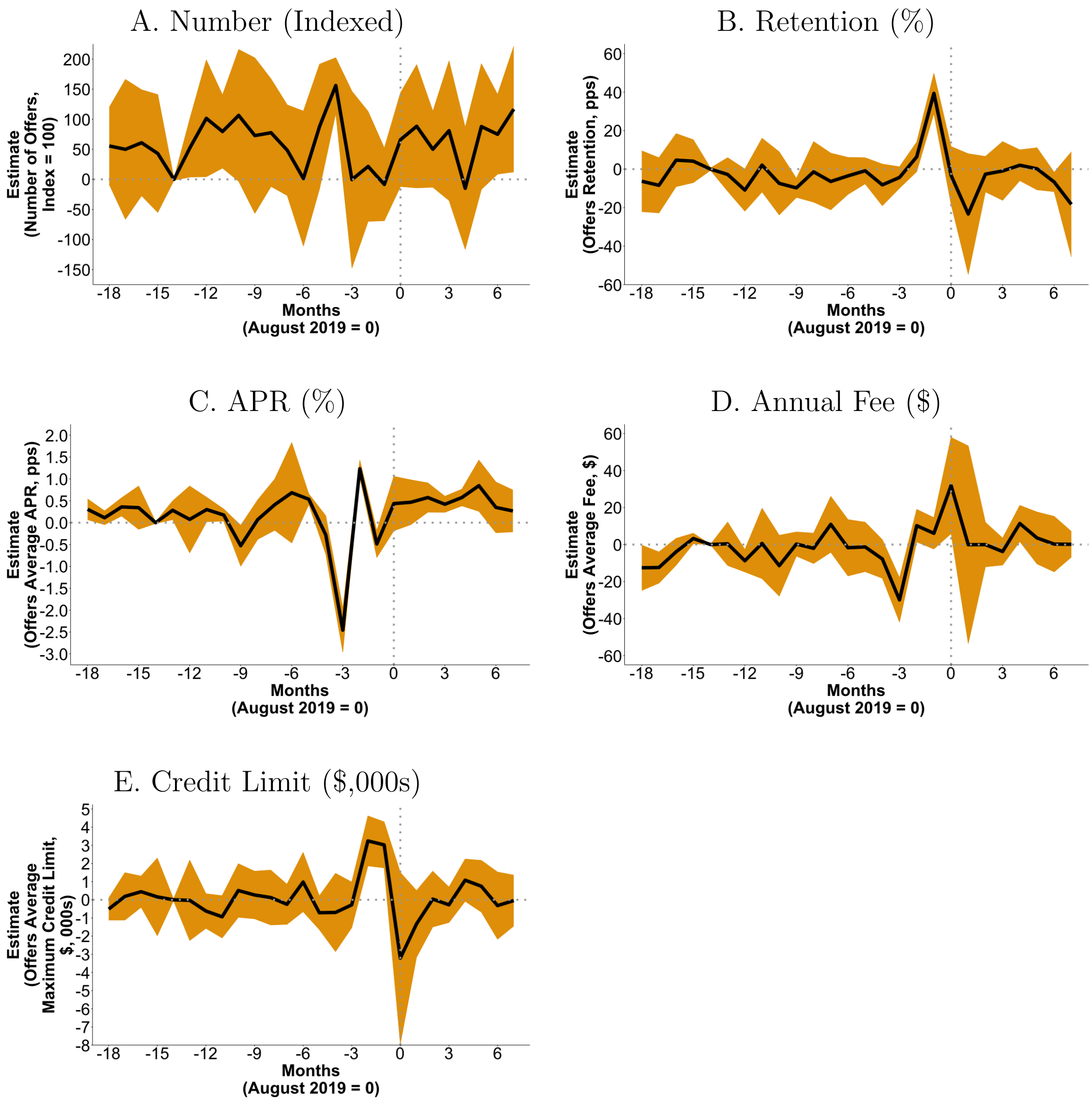
Notes: Data source is TransUnion. This figure presents the estimated effects on a consumer's TransUnion credit score based on our synthetic difference-in-differences (SDID) specification in Equation 2. In each panel, the first set of estimates, labeled "POST (I to VII)," show the effects of the policy pooled across policy Phases I to VII. The next set of estimates show the effects for each phase j of the policy, the δ_j^{PHASE}. The estimates in black are averages, with other colors showing estimates for heterogeneous cuts. Each panel shows a different heterogeneous cut of the data, and different colors within a panel denote the cuts. All heterogeneous cuts are calculated before policy Phase I. Panel A shows effects by whether a consumer is classified as a transactor or a revolver. Panel B shows effects by a consumer's TransUnion credit score. Panel C shows effects by a consumer's payment behavior. Panel D shows effects by whether a consumer is classified as making payments across cards proportionally to their balance ("balance-matching heuristic"). Standard errors are calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021), with error bars showing 95% confidence intervals. Sample: credit cards held by 24.4 million Canadian consumers over 97 months.

Figure 8: Heterogeneous effects of the policy on credit card limits



Notes: Data source is TransUnion. This figure presents the estimated effects on a consumer's total credit card limits (measured in Canadian dollars) based on our synthetic difference-in-differences (SDID) specification in Equation 2. In each panel, the first set of estimates, labeled "POST (I to VII)," show the effects of the policy pooled across policy Phases I to VII. The next set of estimates show the effects for each phase j of the policy, the δ_j^{PHASE}. The estimates in black are averages, with other colors showing estimates for heterogeneous cuts. Each panel shows a different heterogeneous cut of the data, and different colors within a panel denote the cuts. All heterogeneous cuts are calculated before policy Phase I. Panel A shows effects by whether a consumer is classified as a transactor or a revolver. Panel B shows effects by a consumer's TransUnion credit score. Panel C shows effects by a consumer's payment behavior. Panel D shows effects by whether a consumer is classified as making payments across cards proportionally to their balance ("balance-matching heuristic"). Standard errors are calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021), with error bars showing 95% confidence intervals. Sample: credit cards held by 24.4 million Canadian consumers over 97 months.

Figure 9: Monthly mailed credit card offers



Notes: Data source is Mintel Comperemedia. Each panel reports the SDID estimates of the effect of Bill 134 on a different outcome based on the number and characteristics of mailed credit card offers between July 2018 and March 2020. The measure in Panel A is the number of offers in a month (normalized to 100 in August 2018). For consumers receiving offers: Panel B shows the percentage of offers meant to retain an existing cardholder (e.g., to upgrade or renew an existing card); Panel C shows the average interest rate (APR) on new purchases listed on offers; Panel D shows the average annual fee listed on offers; Panel E shows the average maximum credit limit listed on offers.

Table 1: Credit card issuer minimum payment formulas in Quebec and the rest of Canada

Issuer	Quebec Cards in July 2019 & Cards in Rest of Canada from July 2019 onward	Quebec Cards Opened Before August 2019 Phase I August 2019	Phase II August 2020	Phase III August 2021	Phase IV August 2022	Phase V August 2023	Phase VI August 2024	Phase VII August 2025
A	$10 + interest + fees	max{2.0% B, $10}	max{2.5% B, $10}	max{3.0% B, $10}	max{3.5% B, $10}	max{4.0% B, $10}	max{4.5% B, $10}	max{5.0% B, $10}
B	$10 + interest + fees	max{2.0% B, $10}	max{2.5% B, $10}	max{3.0% B, $10}	max{3.5% B, $10}	max{4.0% B, $10}	max{4.5% B, $10}	max{5.0% B, $10}
C	$10 + interest + fees	max{2.5% B, $10}	max{2.5% B, $10}	max{3.0% B, $10}	max{3.5% B, $10}	max{4.0% B, $10}	max{4.5% B, $10}	max{5.0% B, $10}
D	$10 + interest + fees	max{2.5% B, $10}	max{2.5% B, $10}	max{3.0% B, $10}	max{3.5% B, $10}	max{4.0% B, $10}	max{4.5% B, $10}	max{5.0% B, $10}
E	$10 + interest + fees	max{2.5% B, $10}	max{3.0% B, $10}	max{3.5% B, $10}	max{4.0% B, $10}	max{4.5% B, $10}	max{5.0% B, $10}	max{5.0% B, $10}
F	$10 + interest + fees	max{3.0% B, $10}	max{3.0% B, $10}	max{3.0% B, $10}	max{3.5% B, $10}	max{4.0% B, $10}	max{4.5% B, $10}	max{5.0% B, $10}
G	max{1.0% B, $10}	max{3.0% B, $10}	max{3.0% B, $10}	max{3.0% B, $10}	max{3.5% B, $10}	max{4.0% B, $10}	max{4.5% B, $10}	max{5.0% B, $10}
H	max{2.0% B, $10}	max{2.0% B, $10}	max{2.5% B, $10}	max{3.0% B, $10}	max{3.5% B, $10}	max{4.0% B, $10}	max{4.5% B, $10}	max{5.0% B, $10}
I	max{2.0% B, $10}	max{2.0% B, $10}	max{2.5% B, $10}	max{3.0% B, $10}	max{3.5% B, $10}	max{4.0% B, $10}	max{4.5% B, $10}	max{5.0% B, $10}
J	max{2.5% B, $10}	max{2.5% B, $10}	max{2.5% B, $10}	max{3.0% B, $10}	max{3.5% B, $10}	max{4.0% B, $10}	max{4.5% B, $10}	max{5.0% B, $10}
K	max{3.0% B, $10}	max{3.0% B, $10}	max{3.0% B, $10}	max{3.0% B, $10}	max{3.5% B, $10}	max{4.0% B, $10}	max{4.5% B, $10}	max{5.0% B, $10}

Notes: This table shows the history of credit card minimum payment formulas used by different credit card issuers for cards opened before August 2019. For new cards, all issuers changed their formulas to be the required minimum of max{5.0% ob, $10} in Quebec (only) in August 2019. “B” denotes the outstanding balance (the statement balance inclusive of interest and fees).

Table 2: Weights for each province in synthetic difference-in-differences

Province	Province Weight ($\hat{\omega}_p$)
Quebec	1.0000
Alberta	0.1252
British Columbia	0.1185
Manitoba	0.1131
New Brunswick	0.1353
Newfoundland & Labrador	0.1364
Nova Scotia	0.1372
Ontario	0.1225
Saskatchewan	0.1118

Notes: This table shows the $\hat{\omega}_p$ weights for each province that are used in our dynamic synthetic difference-in-differences (SDID) specification specified in Equation 2. Each time period after our six-month matching periods receives equal time weight ($\hat{\lambda}_t$).

Table 3: Shares of consumers in heterogeneous groups

Heterogeneous group	Share (%)
Transacting Status	
Revolver	77.78
Transactor	22.22
Credit Score	
Subprime	8.68
Near Prime	12.68
Prime	12.68
Prime Plus	22.75
Superprime	43.21
Payer Type	
Exact Min. Payer	1.00
Near Min. Payer	3.86
Mixed Payer	22.41
Full Payer	72.72
Balance-Matching	
Balance-Matcher	18.28
Non-Balance-Matcher	81.72

Notes: Data source is TransUnion. The classifications transacting status, credit score, and payer type each independently partition all consumers, so shares sum to 100% within each classification. The balance-matching classification is the exception: it is defined only for a subset of 0.67 million consumers (11.5% of the 5.83 million total); within this subset, shares also sum to 100%.

Table 4: **Synthetic difference-in-differences estimates for the effects of the policy**

Phase	Minimum Payment ($) (1)	Revolving Debt ($) (2)	Statement Balance ($) (3)	Any Delinquency Transition (pps) (4)	Any Default Transition (pps) (5)	Credit Limit ($) (6)
I	14.72	-155.15	-82.60	0.1606	0.0165	-134.00
	(1.47)	(42.86)	(32.14)	(0.0457)	(0.0161)	(170.40)
II	20.72	-177.37	-72.16	0.1279	0.0165	-78.01
	(2.71)	(46.27)	(68.80)	(0.0528)	(0.0236)	(243.28)
III	32.48	-144.31	-100.40	0.0944	0.0034	-205.81
	(3.47)	(70.68)	(64.48)	(0.0462)	(0.0258)	(307.45)
IV	47.11	-273.53	-290.75	0.1055	0.0017	-590.94
	(5.05)	(101.84)	(117.03)	(0.0468)	(0.0219)	(460.90)
V	63.93	-422.99	-472.05	0.1398	0.0135	-1006.13
	(6.46)	(143.11)	(165.41)	(0.0672)	(0.0295)	(662.27)
VI	81.63	-550.40	-621.52	0.1727	0.0205	-1564.09
	(9.78)	(176.56)	(205.43)	(0.0737)	(0.0341)	(904.54)
VII	89.33	-618.48	-713.70	0.1815	0.0212	-1905.31
	(11.10)	(197.49)	(221.68)	(0.0778)	(0.0388)	(999.29)
I to VII	47.50	-316.64	-312.28	0.1377	0.0128	-712.47
	(4.75)	(95.26)	(96.97)	(0.0531)	(0.0250)	(496.55)
Baseline Mean	119.31	2399.68	3164.58	0.8407	0.2276	12678.56

Notes: Data source is TransUnion. This table presents the estimated effects on consumer outcomes based on our synthetic difference-in-differences (SDID) specification in Equation 2. The first set of estimates show the effects for each phase $j \in \{I, ..., VII\}$ of the policy, the δ_j^{PHASE}. The final set of estimates, labeled "POST (I to VII)," show the effects of the policy pooled across policy Phases I to VII. Each policy phase raises the minimum payment requirement by 50 basis points, from 2% in August 2019 (Phase I) to 5% in August 2025 (Phase VII). Each column shows estimates for a different outcome, and the final row of each column displays the baseline mean for each outcome. The units of columns 1, 2, 3, and 6 are Canadian dollars. The units in columns 4 and 5 are in percentage points (pps). The outcome "Any Delinquency Transition" is a binary variable that takes a value of one if any of a consumer's credit card accounts transitions from being current in the previous month to being 30 or more days past due in this month. The outcome "Any Default Transition" is a binary variable that takes a value of one if any of a consumer's credit card accounts transitions to being 90 or more days past due in this month. Standard errors are shown in parentheses, calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021). Sample: credit cards held by 24.4 million Canadian consumers over 97 months.

Table 5: Synthetic difference-in-differences estimates for the effects of the policy on new card openings

Phase	Number of New Credit Cards Opened Per 100 Consumers (1)	Value of New Credit Card Limits Per 100 Consumers ($) (2)	Mean Credit Card Limit of New Cards Opened ($) (3)	Mean Credit Score of New Cards Opened (4)
I	-0.136	-342	-51	0.46
	(0.081)	(376)	(139)	(4.68)
II	-0.157	81	378	1.85
	(0.065)	(392)	(373)	(6.68)
III	-0.344	-808	417	1.60
	(0.023)	(392)	(309)	(6.28)
IV	-0.415	-977	628	4.59
	(0.040)	(358)	(241)	(4.48)
V	-0.351	-771	538	5.53
	(0.050)	(370)	(222)	(3.78)
VI	-0.287	-578	394	7.12
	(0.070)	(414)	(353)	(3.60)
VII	-0.255	-1589	-963	10.50
	(0.082)	(591)	(502)	(5.68)
I to VII	-0.279	-657	265	4.14
	(0.052)	(340)	(276)	(4.73)
Baseline Mean	1.779	7038	3956	771.66

Notes: Data source is TransUnion. This table presents the estimated effects on consumer outcomes based on our synthetic difference-in-differences (SDID) specification in Equation 2. The first set of estimates show the effects for each phase $j \in \{I, ..., VII\}$ of the policy, the δ_j^{PHASE}. The final set of estimates, labeled "POST (I to VII)," show the effects of the policy pooled across policy Phases I to VII. Each policy phase raises the minimum payment requirement by 50 basis points, from 2% in August 2019 (Phase I) to 5% in August 2025 (Phase VII). Each column shows estimates for a different outcome, and the final row of each column displays the baseline mean for each outcome. The outcome in column (1) is the total number of new credit cards opened in a month per 100 consumers in a province (based on census data). The outcome in column (2) is the total credit limit value (measured in Canadian dollars) for new credit cards opened in a month per 100 consumers in a province (based on census data). Columns 1 and 2 are scaled by 100 to ease presentation. The outcome in column (3) is the mean credit card limit amount (measured in Canadian dollars) for new credit cards opened in a month. The outcome in column (4) is the mean credit score for new credit cards opened in a month, where credit score is measured the month before the date of the new credit card opening to avoid the score being contaminated by the new card opening. Standard errors are shown in parentheses, calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021).

Table 6: **Estimated long-run aggregated impacts in Quebec**

Profit Component	**Aggregate Impact (Annualized)**
Interest Revenue	−\$721.1 mn [−\$1,172.5 mn, −\$269.8 mn]
Late Fee Revenue	+\$3.8 mn [+\$0.6 mn, +\$7.0 mn]
Charge-offs	≈ \$0
Profit	**≈ −\$717.3 mn [−\$1,171.9 mn, −\$262.8 mn]**

Notes: This table estimates the aggregate long-run impact on Quebec, shown in millions (mn) of Canadian dollars. For these calculations, we estimate the long-run impacts based on our SDID Phase VII estimates for different outcomes. The row "Interest Revenue" is estimated based on 5.83 million consumers in Quebec multiplied by our SDID estimates for the long-run decline in revolving debt multiplied by a typical annual interest rate (20%). The row "Late Fee Revenue" is estimated based on 5.83 million consumers in Quebec multiplied by our SDID estimates for the long-run increase in transitions into delinquency multiplied by a typical late fee amount (\$30) and annualized by multiplying by 12. The row "Charge-offs" is estimated as zero given that our SDID approach estimates null effects on transitions into default. In this table, [.] show a range of estimates derived from the 95% confidence intervals.

Table 7: Break-even access cost under externally estimated present bias

		Break-even access cost (Λ^{be}, \$ per consumer in Quebec)		
β	$\gamma = 1 - \beta$	No supply correction (1)	Supply-corrected, external MPB (2)	Supply-corrected, model-implied (3)
0.55	0.45	148	54	43
0.74	0.26	85	31	25
0.83	0.17	56	20	16

Notes: Units of Λ^{be} are in Canadian dollars. The break-even access cost is per consumer in Quebec, not per consumer who loses access. Each entry is Λ^{be} from (17) at the focal cell ($\sigma = 2$, $r = 0.20$, $c_1 = c_2 =$ \$32,672), with $\Delta D(\theta)$ the Phase VII revolving-debt responses of Tables B6 and B7 and $\phi(\theta)$ the shares of Table 3 (3.86% near-minimum payers and 22.41% mixed payers). Column (1) does not apply a supply correction. Columns (2) and (3) show two supply-corrected methodologies to net the response to the limit cut, $(\partial D/\partial L)\Delta L^{\mathrm{VII}}$. Column (2) applies the external marginal propensity to borrow (MPB) by credit score in Agarwal et al. (2018) to our data based on the credit score distribution of each payer type. Column (3) applies the model-based MPB implied by the Section 4.3 borrowing rule, $\partial D/\partial L = \alpha(\theta)(1 - \bar{m}_T)$ for near-minimum payers (0.58) and mixed payers (0.43), the α from baseline revolving debt utilization). External β range: 0.55 (Choukhmane and Palmer, 2026), 0.74 (Allcott et al., 2022), and 0.83 (Lee and Maxted, 2026). See Appendix D for additional details.

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Supplemental Appendix to "Paying Off: Evaluating Credit Card Minimum Payment Requirements"

A Survey Evidence on Credit Card Use in Canada

Survey of Financial Security (SFS). The 2016, 2019, and 2023 Canadian Surveys of Financial Security, conducted by Statistics Canada, ask households about their credit card behaviors. All responses are weighted using the provided probability weights. Table A1 reports results of responses to the survey questions on holding a credit card and, among cardholders responses to the following question on credit card repayment behaviors: "Over the last 12 months, on your (and your family's credit cards), what did you usually pay?"

Table A1: SFS Card Repayment

	2016		2019		2023	
	QC	Canada	QC	Canada	QC	Canada
% with a credit card	85.6	87.2	88.8	89.9	92.6	92.2
Less than minimum	1.6	1.4	0.8	1.4	1.7	1.8
Minimum	5.7	5.8	6.8	6.6	5.9	7.1
More than minimum but less than full	28.5	28.9	27.6	29.6	24.2	26.5
Full amount	64.2	63.9	64.8	62.3	68.3	64.5

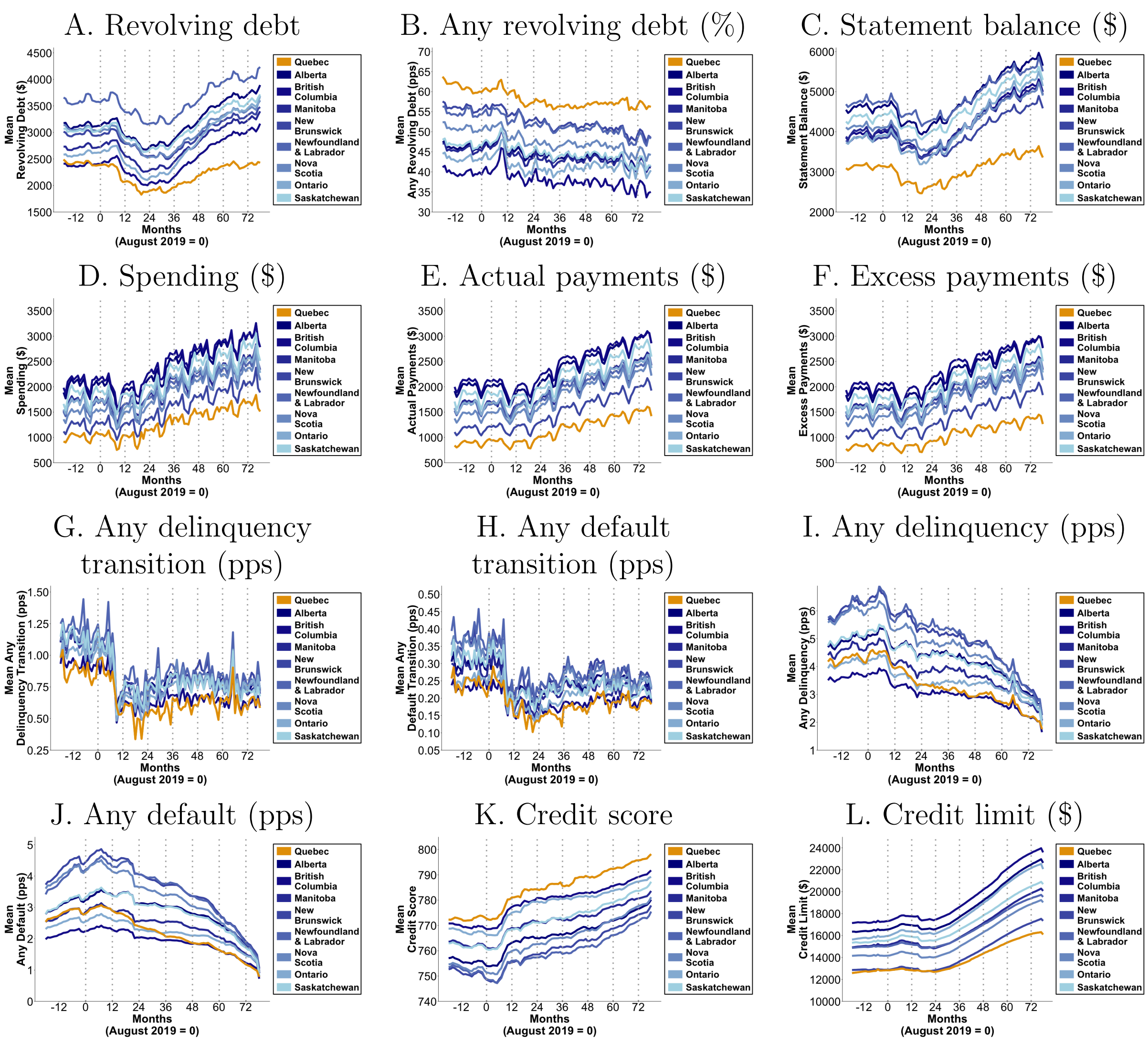
Personal Cardholder Survey (PCS). The marketing firm Ipsos-Reid surveys approximately 10,000 households about their credit cards. Similar to the SFS, Table A2 reports PCS responses for how much consumers typically pay on their balance. A slightly higher fraction of households in the PCS compared to the SFS report paying the full amount, but the fraction who report paying the minimum is similar across both surveys.

Table A2: PCS Card Repayment

	2016		2019	
	QC	Canada	QC	Canada
Minimum	6.8	5.7	6.7	5.9
More than minimum but less than full	23.2	22.5	23.2	22.6
Full amount	67.6	69.3	67.5	68.8
Don't know	2.4	2.5	2.6	2.7

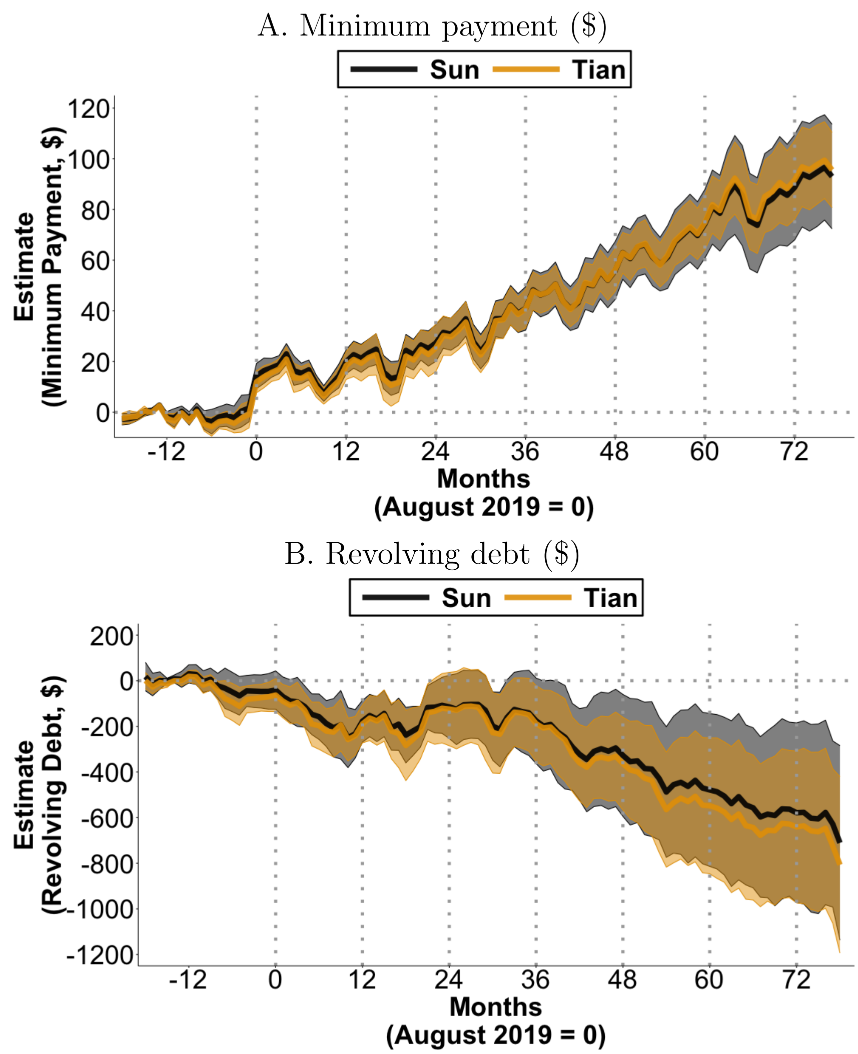
B Additional Consumer Credit Reporting Data Results

Figure B1: Means of credit card outcomes by province



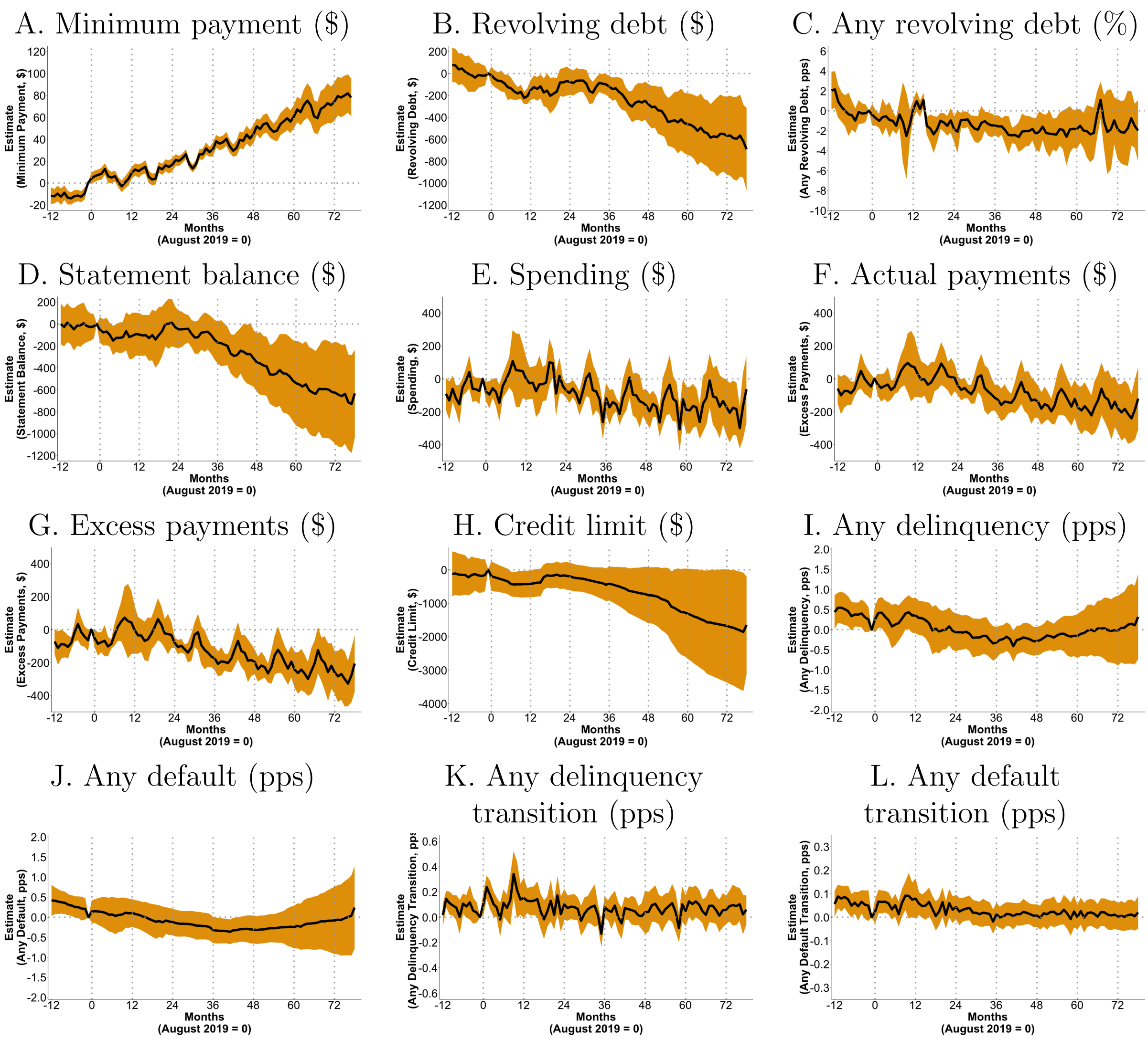
Notes: Data source is TransUnion. Each panel plots monthly means of one credit card outcome by province. Outcomes are measured at the consumer-level. Panels A, C, D, E, F, and L are all measured in Canadian dollars, Panels B, G, H, I, and J in percentage points, and Panel K in credit score points. The outcome in Panel G is a binary variable that takes a value of one if any credit card account transitions from being current in the previous month to being 30 or more days past due in this month, and in Panel H if any credit card account transitions to being 90 or more days past due in this month. The outcome in Panel I is a binary variable that takes a value of one if any credit card account is 30 or more days past due, and in Panel J if any is 90 or more days past due. Dashed vertical lines mark the start of each policy phase, which raise the requirement by 50 basis points each August from 2% in 2019 (Phase I) to 5% in 2025 (Phase VII). Sample: credit cards held by 24.4 million Canadian consumers over 97 months.

Figure B2: Robustness of synthetic difference-in-differences estimates on minimum payments and revolving credit card debt to alternative weighting approaches



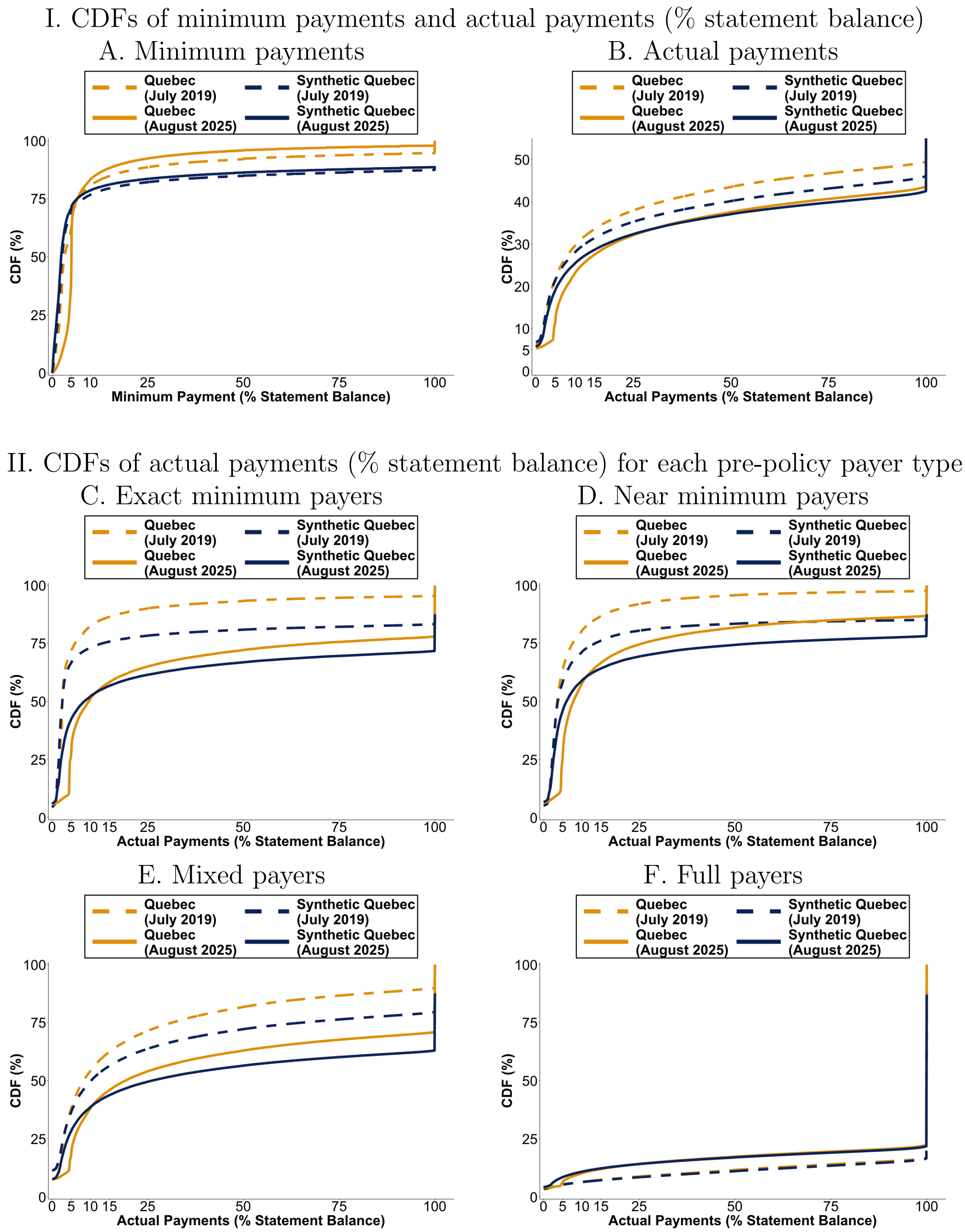
Notes: Data source is TransUnion. Estimates for the effects of the policy using two alternative weighting approaches, based on Sun et al. (2026) (black) and Tian et al. (2026) (orange), to construct the synthetic control. Months -13 to -18 are used to construct the synthetic controls. These two methods match on the outcomes: minimum payment, revolving debt, statement balance, any delinquency transition, any default transition, and credit limit. Each panel in this figure presents the estimated dynamic effects for a different outcome for τ months after the Quebec policy began, the δ_τ estimates calculated from Equation 3 using our SDID specification in Equation 2. The outcome in Panel A is a consumer's credit card minimum payments, measured in Canadian dollars. The outcome in Panel B is a consumer's total credit card revolving debt, measured in Canadian dollars. Plots show 95% confidence intervals calculated using placebo variance estimation. Dashed vertical lines mark the start of each policy phase, which raise the requirement by 50 basis points each August from 2% in 2019 (Phase I) to 5% in 2025 (Phase VII). Sample: credit cards held by 24.4 million Canadian consumers over 97 months.

Figure B3: Difference-in-differences monthly estimates for the effects of the policy on credit card outcomes



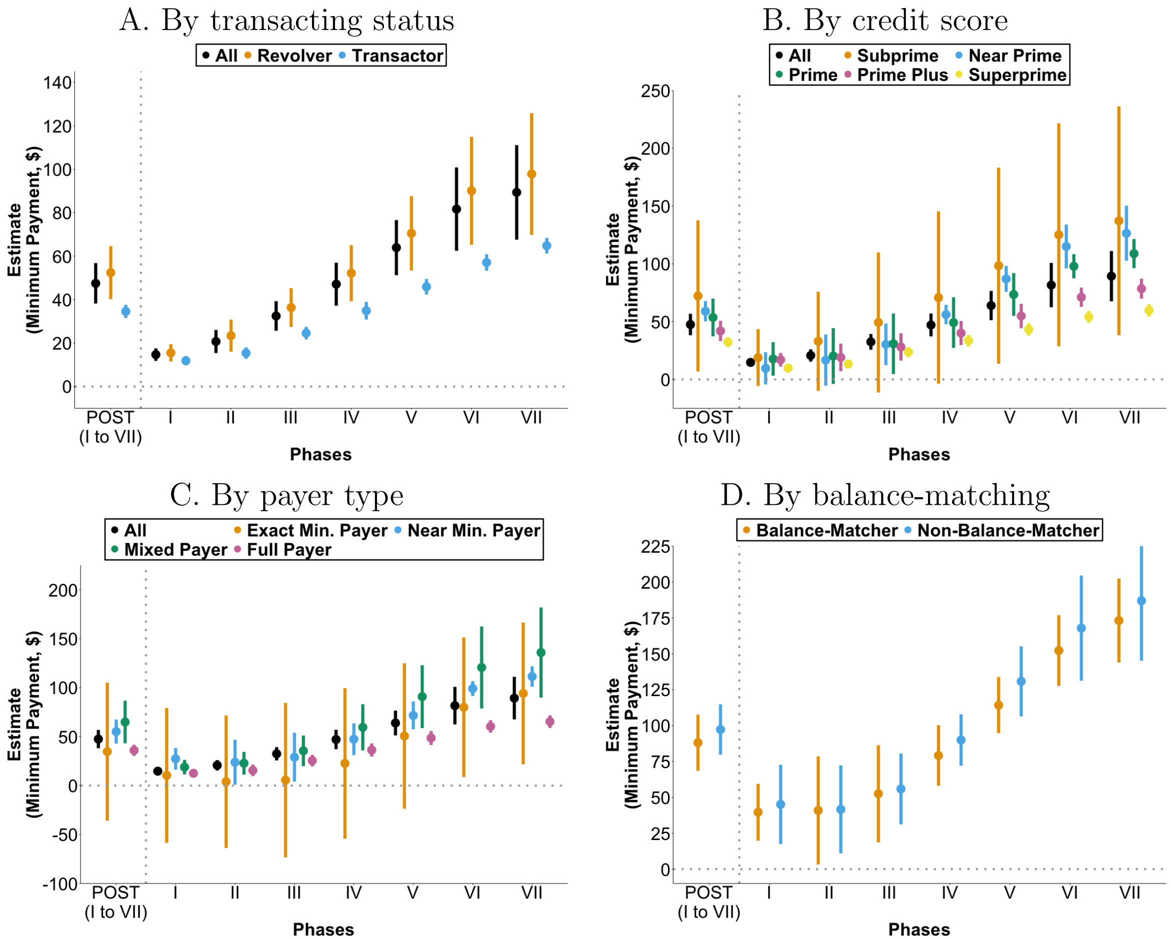
Notes: Data source is TransUnion. Each panel in this figure presents results for a different outcome, estimated by the dynamic effects for τ months after the Quebec policy began, the δ_τ estimates are from our dynamic difference-in-differences (DID) specification in Equation (4), using the SDID provincial weights. The outcomes in panels C, I, J, K, and L are measured in percentage points, and the outcomes in all other panels are measured in Canadian dollars. The outcome in Panel C is a binary variable that takes a value of one if any credit card account held by a consumer is revolving debt. The outcome in Panel I is a binary variable that takes a value of one if any credit card account is 30 or more days past due, and in Panel J if it is 90 or more days past due. The outcome in Panel K is a binary variable that takes a value of one if any credit card account transitions to being 30 or more days past due from previously being less than 30 days past due, and in Panel L if transitions to being 90 or more days past due. Plots show 95% confidence intervals calculated using placebo variance estimation. Dashed vertical lines mark the start of each policy phase, which raise the requirement by 50 basis points each August from 2% in 2019 (Phase I) to 5% in 2025 (Phase VII). Sample: credit cards held by 24.4 million Canadian consumers over 97 months.

Figure B4: Distributions of credit card minimum payments and actual payments in July 2019 (pre-policy) and August 2025 (Phase VII)



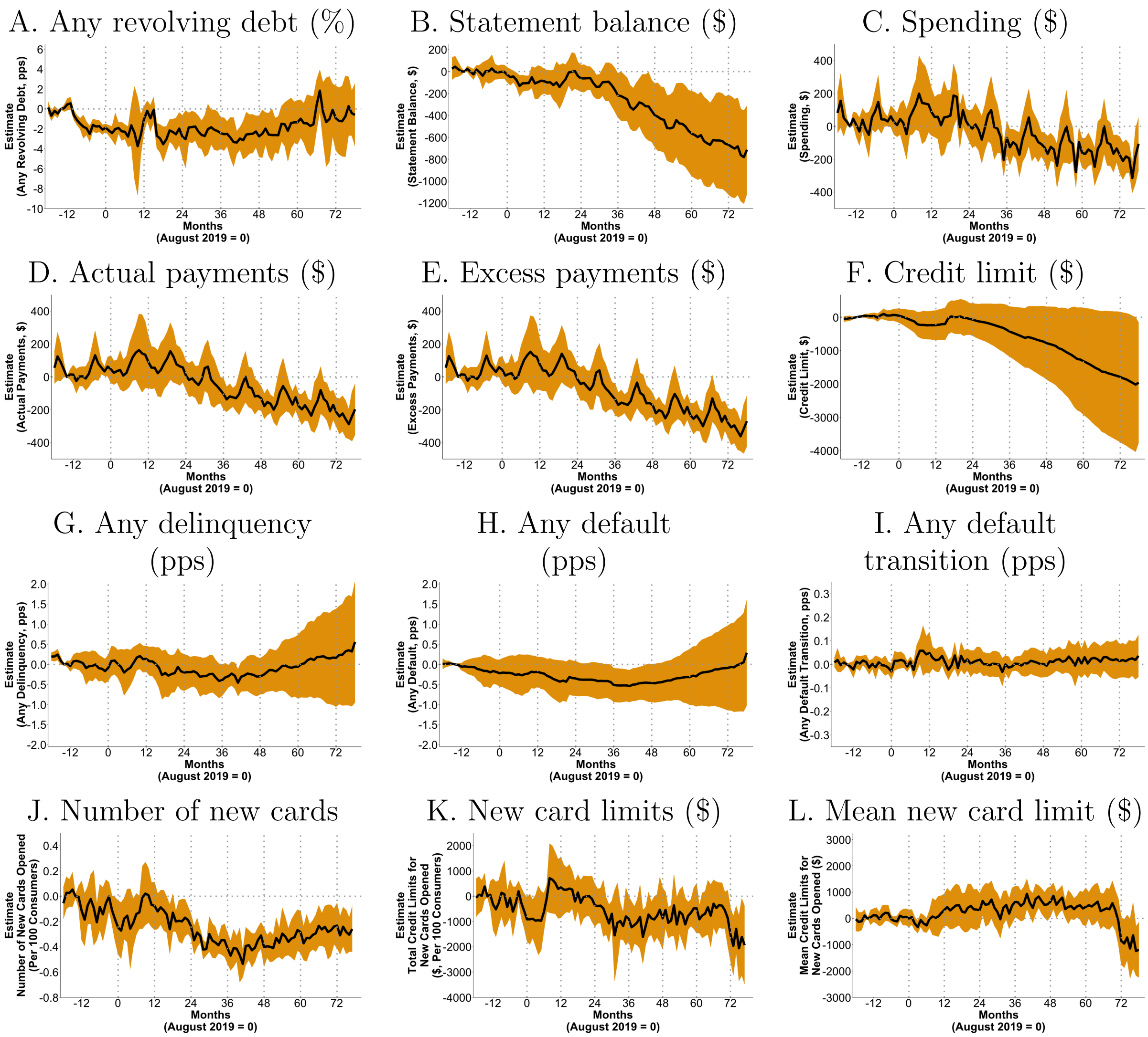
Notes: Data source is TransUnion. Each panel shows CDFs of credit card accounts in Quebec and Synthetic Quebec during July 2019 (pre-policy Phase I) and August 2025 (Phase VII). Synthetic Quebec weights observations from each province by their synthetic difference-in-differences weights. Panels C to F segment accounts based on a consumer's pre-policy payment behavior. All panels restrict to account months where the minimum payment is greater than zero and the statement balance is greater than $10.

Figure B5: Heterogeneous effects of the policy on minimum payments



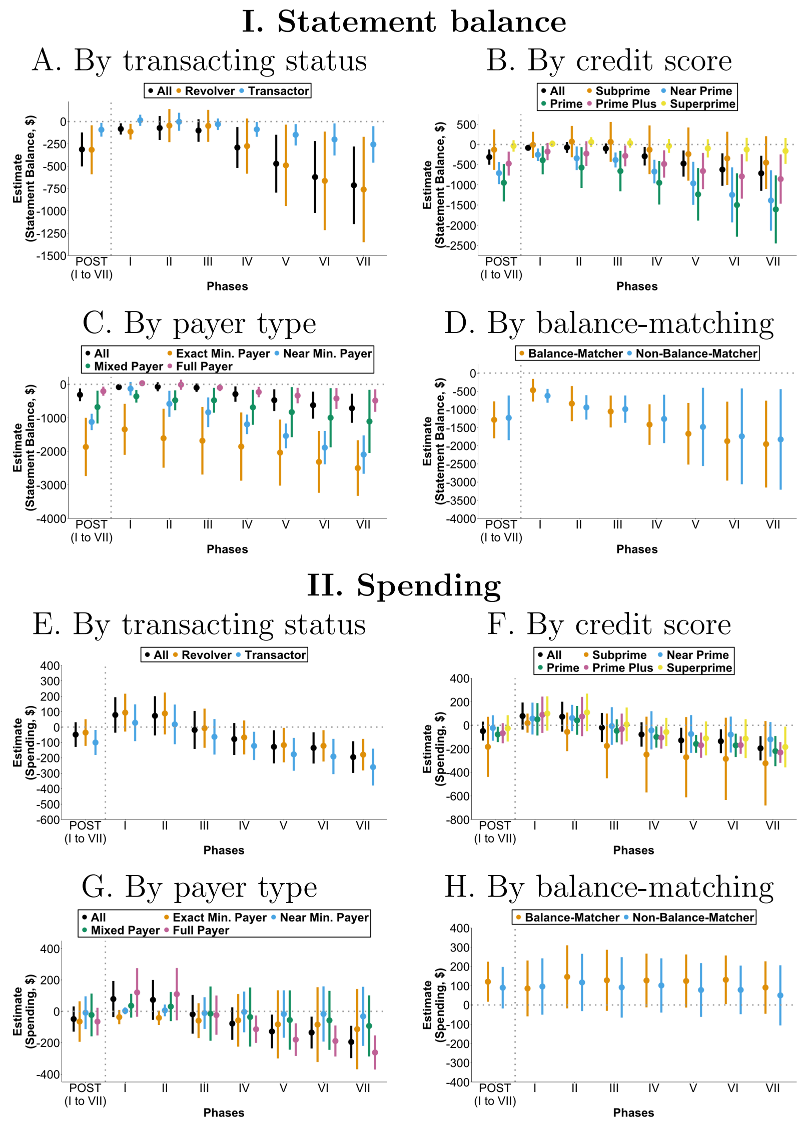
Notes: Data source is TransUnion. This figure presents the estimated effects on a consumer's credit card minimum payment amount (measured in Canadian dollars) based on our synthetic difference-in-differences (SDID) specification in Equation (2). In each panel, the first set of estimates, labeled "POST (I to VII)," show the effects of the policy pooled across policy Phases I to VII. The next set of estimates show the effects for each phase j of the policy, the δ_j^{PHASE}. In all panels, the estimates in black show the average estimates, with other colors showing estimates for heterogeneous cuts. Each panel shows a different heterogeneous cut of the data, and different colors within a panel denote the cuts. All heterogeneous cuts are calculated before policy Phase I. Panel A shows heterogeneous effects by whether a consumer is classified as a transactor or a revolver. Panel B shows heterogeneous effects by a consumer's TransUnion credit score. Panel C shows heterogeneous effects by a consumer's payment behavior. Panel D shows heterogeneous effects by whether a consumer is classified as making payments across cards proportionally to their balance ("balance-matching heuristic"). Error bars show 95% confidence intervals calculated using placebo variance estimation. Sample: credit cards held by 24.4 million Canadian consumers over 97 months.

Figure B6: Monthly effects of the policy on other credit card outcomes



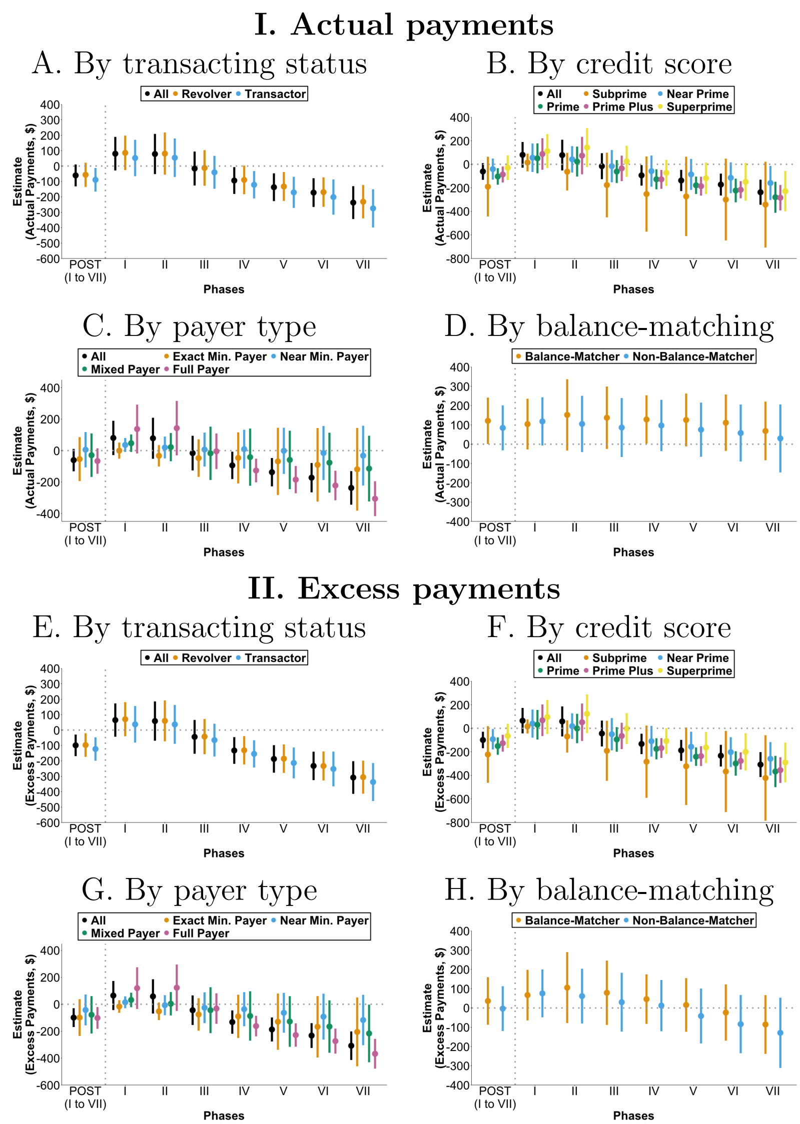
Notes: Data source is TransUnion. Estimates for the effects of the policy. Each panel of this figure presents the estimated dynamic effects for a different outcome for τ months after the Quebec policy began, the δ_τ estimates calculated from Equation (3) using our synthetic difference-in-differences (SDID) specification in Equation (2). The outcomes in Panels A, G, H, and I are all measured in percentage points, and the outcomes in all other panels are measured in Canadian dollars. The outcome in Panel J is the total number of new credit cards opened in a month per 100 consumers in a province (based on census data). The outcome in Panel K is the total credit limit value (measured in Canadian dollars) for new credit cards opened in a month per 100 consumers in a province (based on census data). The outcome in Panel L is the mean credit card limit amount for new credit cards opened in a month. Months -13 to -18 are used to construct the synthetic control. Plots show 95% confidence intervals calculated using placebo variance estimation. Dashed vertical lines mark the start of each policy phase, which raise the requirement by 50 basis points each August from 2% in 2019 (Phase I) to 5% in 2025 (Phase VII). Sample: credit cards held by 24.4 million Canadian consumers over 97 months.

Figure B7: Heterogeneous effects of the policy on statement balances and spending



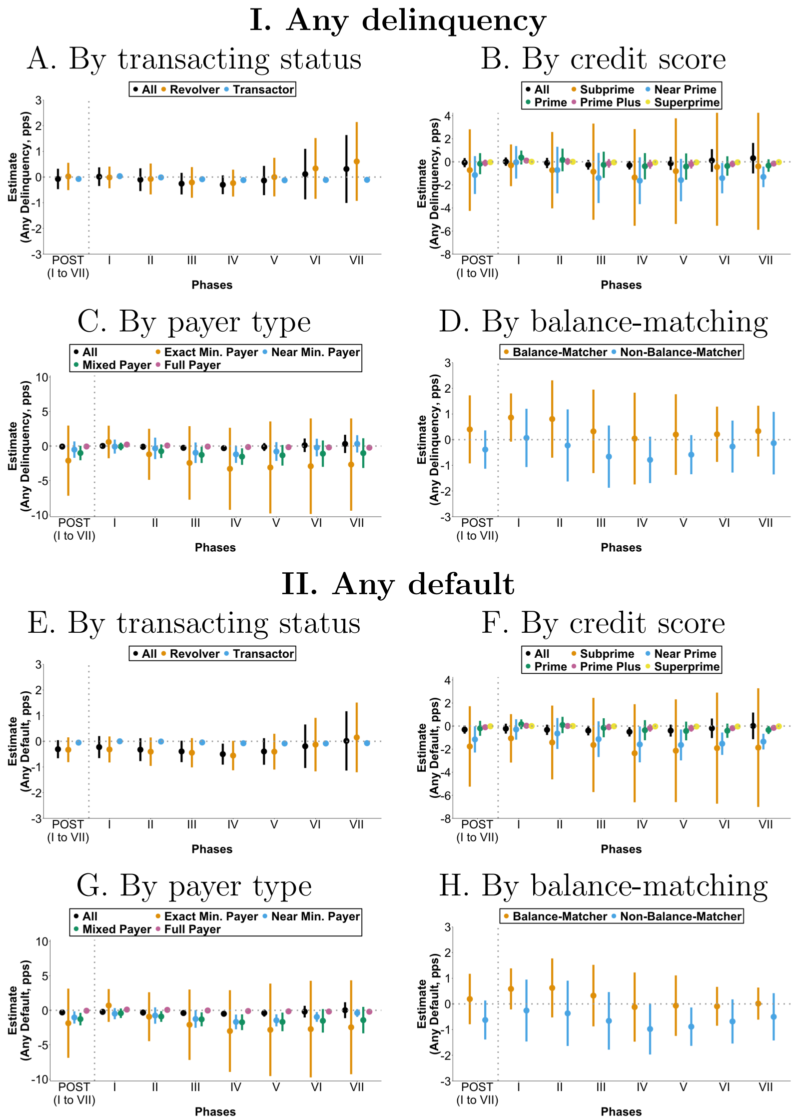
Notes: Data source is TransUnion. This figure presents the estimated effects on outcomes based on our synthetic difference-in-differences (SDID) specification in Equation (2). The outcomes are a consumer's credit card statement balance (Panels A to D) and credit card spending (Panels E to H), both in Canadian dollars. In each panel, the first set of estimates, labeled "POST (I to VII)," show the effects of the policy pooled across policy Phases I to VII. The next set of estimates show the effects for each phase j of the policy, the δ_j^{PHASE}. In all panels, the estimates in black show the average estimates, with other colors showing estimates for heterogeneous cuts. Each panel shows a different heterogeneous cut of the data, and different colors within a panel denote the cuts. All heterogeneous cuts are calculated before policy Phase I. Panels A and E show heterogeneous effects by whether a consumer is classified as a transactor or a revolver. Panels B and F show heterogeneous effects by a consumer's TransUnion credit score. Panels C and G show heterogeneous effects by a consumer's payment behavior. Panels D and H show heterogeneous effects by whether a consumer is classified as making payments across cards proportionally to their balance ("balance-matching heuristic"). Error bars show 95% confidence intervals calculated using placebo variance estimation. Sample: credit cards held by 24.4 million Canadian consumers over 97 months.

Figure B8: Heterogeneous effects of the policy on actual payments and excess payments



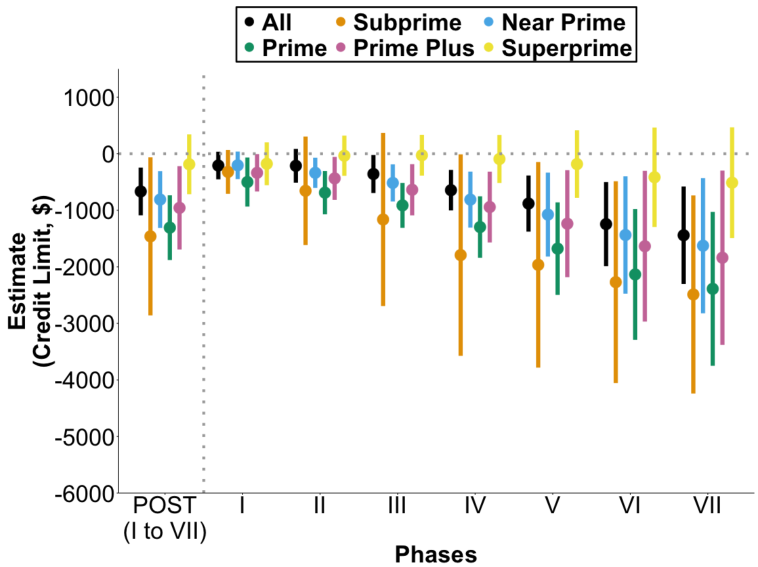
Notes: Data source is TransUnion. This figure presents the estimated effects on outcomes based on our synthetic difference-in-differences (SDID) specification in Equation (2). The outcomes are a consumer's actual credit card payment (Panels A to D) and the payment made in excess of the minimum (Panels E to H), both in Canadian dollars. In each panel, the first set of estimates, labeled "POST (I to VII)," show the effects of the policy pooled across policy Phases I to VII. The next set of estimates show the effects for each phase j of the policy, the δ_j^{PHASE}. In all panels, the estimates in black show the average estimates, with other colors showing estimates for heterogeneous cuts. Each panel shows a different heterogeneous cut of the data, and different colors within a panel denote the cuts. All heterogeneous cuts are calculated before policy Phase I. Panels A and E show heterogeneous effects by whether a consumer is classified as a transactor or a revolver. Panels B and F show heterogeneous effects by a consumer's TransUnion credit score. Panels C and G show heterogeneous effects by a consumer's payment behavior. Panels D and H show heterogeneous effects by whether a consumer is classified as making payments across cards proportionally to their balance ("balance-matching heuristic"). Error bars show 95% confidence intervals calculated using placebo variance estimation. Sample: credit cards held by 24.4 million Canadian consumers over 97 months.

Figure B9: Heterogeneous effects of the policy on delinquency and default



Notes: Data source is TransUnion. This figure presents the estimated effects on outcomes based on our synthetic difference-in-differences (SDID) specification in Equation (2). The outcomes are indicators, in percentage points, for a consumer having any credit card account that is delinquent, defined as 30+ days past due (Panels A to D), and any account in default, defined as 90+ days past due (Panels E to H). In each panel, the first set of estimates, labeled "POST (I to VII)," show the effects of the policy pooled across policy Phases I to VII. The next set of estimates show the effects for each phase j of the policy, the δ_j^{PHASE}. In all panels, the estimates in black show the average estimates, with other colors showing estimates for heterogeneous cuts. Each panel shows a different heterogeneous cut of the data, and different colors within a panel denote the cuts. All heterogeneous cuts are calculated before policy Phase I. Panels A and E show effects by whether a consumer is classified as a transactor or a revolver. Panels B and F show effects by a consumer's TransUnion credit score. Panels C and G show effects by a consumer's payment behavior. Panels D and H show effects by whether a consumer is classified as making payments across cards proportionally to their balance ("balance-matching heuristic"). Error bars show 95% confidence intervals calculated using placebo variance estimation. Sample: credit cards held by 24.4 million Canadian consumers over 97 months.

Figure B10: Heterogeneous effects of the policy on credit card limits of cards opened pre-policy



Notes: Data source is TransUnion. This figure shows estimates based on our synthetic difference-in-differences (SDID) specification in Equation (2). The outcome is a consumer's total credit card limits, measured in Canadian dollars. This outcome only includes cards opened before August 2019 i.e., before Phase I of the policy began. The estimates in black show the average estimates, with other colors showing estimates for heterogeneous cuts calculated before policy Phase I by a consumer's TransUnion credit score. Error bars show 95% confidence intervals calculated using placebo variance estimation.

Table B1: Difference-in-differences estimates for the effects of the policy

Phase	Minimum Payment ($) (1)	Revolving Debt ($) (2)	Statement Balance ($) (3)	Any Delinquency Transition (pps) (4)	Any Default Transition (pps) (5)	Credit Limit ($) (6)
I	14.90	-134.93	-87.33	0.0751	0.0023	-216.55
	(1.68)	(26.75)	(18.29)	(0.0330)	(0.0136)	(117.02)
II	20.92	-147.34	-58.12	0.0259	-0.0113	-117.13
	(2.90)	(39.71)	(58.31)	(0.0385)	(0.0187)	(171.25)
III	32.23	-108.98	-69.04	-0.0220	-0.0340	-178.45
	(2.80)	(62.75)	(64.89)	(0.0288)	(0.0183)	(215.83)
IV	46.65	-227.22	-231.60	-0.0260	-0.0445	-449.14
	(3.73)	(106.12)	(134.56)	(0.0250)	(0.0106)	(404.04)
V	61.89	-391.19	-417.24	-0.0081	-0.0412	-852.49
	(4.94)	(154.86)	(187.79)	(0.0486)	(0.0154)	(613.29)
VI	77.56	-539.56	-576.57	0.0073	-0.0428	-1378.09
	(7.58)	(197.26)	(238.16)	(0.0460)	(0.0171)	(865.23)
VII	84.67	-609.13	-650.39	0.0079	-0.0475	-1610.59
	(8.79)	(222.89)	(258.47)	(0.0522)	(0.0190)	(951.03)
I to VII	44.25	-278.28	-262.27	0.0110	-0.0287	-595.59
	(3.22)	(92.46)	(101.27)	(0.0299)	(0.0136)	(421.56)

Notes: Data source is TransUnion. This table presents the estimated effects on consumer outcomes using our difference-in-differences (DID) specification in Equation (4). The first set of estimates show the effects for each phase $j \in \{I, ..., VII\}$ of the policy, the δ_j^{PHASE}. The final set of estimates, labeled "POST (I to VII)," show the effects of the policy pooled across policy Phases I to VII estimated using a DID as shown in Equation 6. Each policy phase raises the minimum payment requirement by 50 basis points, from 2% in August 2019 (Phase I) to 5% in August 2025 (Phase VII). Both of these DID regressions apply the provincial weights calculated in our synthetic difference-in-differences approach. Each column shows estimates for a different outcome. The units of columns 1, 2, 3, and 6 are Canadian dollars. The units in columns 4 and 5 are in percentage points (pps). The outcome "Any Delinquency Transition" is a binary variable that takes a value of one if any of a consumer's credit card accounts transitions from being current in the previous month to being 30 or more days past due in this month. The outcome "Any Default Transition" is a binary variable that takes a value of one if any of a consumer's credit card accounts transitions to being 90 or more days past due in this month. Standard errors are shown in parentheses, calculated using placebo variance estimation. This table is calculated using data on the credit cards held by 24.4 million consumers in Canada observed over 91 months, where event month -1 is the omitted category.

Table B2: Synthetic difference-in-differences estimates for the Phase VII effects of the policy, by credit score group

A. Minimum Payment ($)

Phase	Subprime (1)	Near Prime (2)	Prime (3)	Prime Plus (4)	Superprime (5)
VII	137.21	126.46	108.86	78.54	59.78
	(50.52)	(12.16)	(6.43)	(4.43)	(2.82)
Baseline Mean	234.49	171.31	165.35	113.12	71.81

B. Revolving Debt ($)

Phase	Subprime (1)	Near Prime (2)	Prime (3)	Prime Plus (4)	Superprime (5)
VII	-278.42	-1339.17	-1499.19	-745.64	-83.39
	(367.29)	(362.82)	(412.53)	(277.97)	(105.20)
Baseline Mean	4490.06	4406.92	4714.14	2393.10	807.95

C. Any Delinquency Transition (pps)

Phase	Subprime (1)	Near Prime (2)	Prime (3)	Prime Plus (4)	Superprime (5)
VII	0.7726	0.1321	0.0343	-0.0034	-0.014
	(0.2960)	(0.1710)	(0.1062)	(0.0446)	(0.0127)
Baseline Mean	5.0839	2.1248	0.6614	0.1343	0.0074

D. Any Default Transition (pps)

Phase	Subprime (1)	Near Prime (2)	Prime (3)	Prime Plus (4)	Superprime (5)
VII	0.1499	-0.0495	-0.0254	-0.0188	-0.0050
	(0.1871)	(0.0600)	(0.0209)	(0.0134)	(0.0037)
Baseline Mean	1.9056	0.3846	0.0090	0.0046	0.0015

E. Credit Score

Phase	Subprime (1)	Near Prime (2)	Prime (3)	Prime Plus (4)	Superprime (5)
VII	5.21	15.07	11.69	6.19	4.05
	(15.78)	(6.93)	(5.98)	(3.85)	(1.81)
Baseline Mean	528.77	661.42	735.51	798.86	849.4

F. Credit Limit ($)

Phase	Subprime (1)	Near Prime (2)	Prime (3)	Prime Plus (4)	Superprime (5)
VII	-3061.85	-2044.28	-3041.58	-2501.75	-987.57
	(1208.25)	(1167.60)	(1292.49)	(1438.41)	(1039.82)
Baseline Mean	7420.64	9747.64	12410.08	13110.59	14435.21

Notes: Data source is TransUnion. Estimated effects on consumer outcomes using our synthetic difference-in-differences (SDID) estimation. Estimates are for the effects during Phase VII of the policy by baseline TransUnion credit score group. Each panel shows a different outcome. Panels report outcomes: the columns are subprime (<600), near prime (600-699), prime (700-769), prime plus (770-829), and superprime (830+). Standard errors are shown in parentheses and are calculated using placebo variance estimation. Sample: credit cards held by 24.4 million Canadian consumers over 97 months.

Table B3: Synthetic difference-in-differences estimates for the effects of the policy on revolvers

Phase	Minimum Payment ($) (1)	Revolving Debt ($) (2)	Statement Balance ($) (3)	Any Delinquency Transition (pps) (4)	Any Default Transition (pps) (5)	Credit Limit ($) (6)
I	15.53	-198.89	-113.29	0.2117	0.0207	-153.28
	(2.03)	(63.08)	(44.79)	(0.0564)	(0.0203)	(208.93)
II	23.40	-171.09	-45.28	0.2008	0.0292	-13.02
	(3.76)	(68.87)	(94.54)	(0.0675)	(0.0271)	(280.32)
III	36.36	-109.56	-48.50	0.1654	0.0153	-92.95
	(4.55)	(97.78)	(91.23)	(0.0557)	(0.0298)	(338.98)
IV	52.16	-272.59	-274.94	0.1828	0.0133	-506.07
	(6.59)	(145.88)	(157.71)	(0.0585)	(0.0266)	(491.09)
V	70.48	-456.36	-490.55	0.2286	0.0281	-937.93
	(8.74)	(213.61)	(232.67)	(0.0924)	(0.0369)	(691.46)
VI	90.07	-607.63	-664.42	0.2711	0.0378	-1504.92
	(12.66)	(259.43)	(281.70)	(0.0978)	(0.0428)	(918.47)
VII	97.79	-685.03	-761.16	0.2848	0.0392	-1848.98
	(14.29)	(286.34)	(301.12)	(0.1031)	(0.0486)	(995.34)
I to VII	52.41	-336.57	-316.10	0.2167	0.0254	-651.15
	(6.23)	(140.41)	(139.91)	(0.0690)	(0.0303)	(521.30)
Baseline Mean	138.78	2953.22	3683.18	1.0411	0.2814	12432.02

Notes: Data source is TransUnion. This table presents the estimated effects on consumer outcomes based on our synthetic difference-in-differences (SDID) specification in Equation (2) for the subset of consumers classified as revolvers pre-policy. The first set of estimates show the effects for each phase $j \in \{I, ..., VII\}$ of the policy, the δ_j^{PHASE}. The final set of estimates, labeled "POST (I to VII)," show the effects of the policy pooled across policy Phases I to VII. Each policy phase raises the minimum payment requirement by 50 basis points, from 2% in August 2019 (Phase I) to 5% in August 2025 (Phase VII). Each column shows estimates for a different outcome, and the final row of each column displays the baseline mean for each outcome. The units of columns 1, 2, 3, and 6 are Canadian dollars. The units in columns 4 and 5 are in percentage points (pps). The outcome "Any Delinquency Transition" is a binary variable that takes a value of one if any of a consumer's credit card accounts transitions from being current in the previous month to being 30 or more days past due in this month. The outcome "Any Default Transition" is a binary variable that takes a value of one if any of a consumer's credit card accounts transitions to being 90 or more days past due in this month. Standard errors are shown in parentheses, calculated using placebo variance estimation.

Table B4: Synthetic difference-in-differences estimates for the effects of the policy on transactors

Phase	Minimum Payment ($) (1)	Revolving Debt ($) (2)	Statement Balance ($) (3)	Any Delinquency Transition (pps) (4)	Any Default Transition (pps) (5)	Credit Limit ($) (6)
I	11.90	-16.27	14.42	0.0142	-0.0003	-126.47
	(1.09)	(10.85)	(31.85)	(0.0093)	(0.0047)	(144.92)
II	15.41	-47.60	-2.46	-0.0194	-0.0056	-261.05
	(1.34)	(10.61)	(51.50)	(0.0073)	(0.0051)	(193.15)
III	24.59	-28.59	-29.85	-0.0343	-0.0129	-485.39
	(1.47)	(18.19)	(32.78)	(0.0105)	(0.0046)	(264.34)
IV	34.87	-33.34	-87.68	-0.0418	-0.0136	-759.14
	(2.06)	(26.00)	(42.34)	(0.0115)	(0.0064)	(408.62)
V	45.91	-62.17	-148.22	-0.0384	-0.0115	-1115.83
	(1.84)	(38.62)	(61.10)	(0.0149)	(0.0057)	(612.66)
VI	57.07	-95.78	-200.30	-0.0302	-0.0123	-1638.29
	(1.94)	(53.40)	(91.63)	(0.0126)	(0.0049)	(891.88)
VII	64.82	-114.09	-256.47	-0.0334	-0.0127	-1947.36
	(1.84)	(64.96)	(104.30)	(0.0157)	(0.0054)	(1030.12)
I to VII	34.56	-53.21	-91.70	-0.0257	-0.0096	-838.8
	(1.55)	(27.67)	(39.35)	(0.0102)	(0.0046)	(459.11)
Baseline Mean	49.99	428.42	1317.75	0.1270	0.0360	13556.55

Notes: Data source is TransUnion. This table presents the estimated effects on consumer outcomes based on our synthetic difference-in-differences (SDID) specification in Equation (2) for the subset of consumers classified as transactors pre-policy. The first set of estimates show the effects for each phase $j \in \{I, ..., VII\}$ of the policy, the δ_j^{PHASE}. The final set of estimates, labeled "POST (I to VII)," show the effects of the policy pooled across policy Phases I to VII. Each policy phase raises the minimum payment requirement by 50 basis points, from 2% in August 2019 (Phase I) to 5% in August 2025 (Phase VII). Each column shows estimates for a different outcome, and the final row of each column displays the baseline mean for each outcome. The units of columns 1, 2, 3, and 6 are Canadian dollars. The units in columns 4 and 5 are in percentage points (pps). The outcome "Any Delinquency Transition" is a binary variable that takes a value of one if any of a consumer's credit card accounts transitions from being current in the previous month to being 30 or more days past due in this month. The outcome "Any Default Transition" is a binary variable that takes a value of one if any of a consumer's credit card accounts transitions to being 90 or more days past due in this month. Standard errors are shown in parentheses, calculated using placebo variance estimation.

Table B5: Synthetic difference-in-differences estimates for the effects of the policy on exact minimum payers

Phase	Minimum Payment ($) (1)	Revolving Debt ($) (2)	Statement Balance ($) (3)	Any Delinquency Transition (pps) (4)	Any Default Transition (pps) (5)	Credit Limit ($) (6)
I	10.43	-1331.76	-1343.16	-0.5146	-0.6018	-1121.92
	(35.13)	(384.53)	(388.64)	(0.2718)	(0.2482)	(431.72)
II	3.97	-1624.08	-1607.95	-0.6436	-0.6563	-1400.79
	(34.56)	(443.26)	(448.75)	(0.2401)	(0.2425)	(499.88)
III	5.57	-1681.74	-1682.63	-0.6911	-0.6825	-1570.96
	(40.25)	(524.54)	(514.44)	(0.2329)	(0.2345)	(597.33)
IV	22.67	-1846.30	-1856.60	-0.6885	-0.6872	-1719.29
	(39.26)	(538.95)	(519.37)	(0.2015)	(0.2140)	(734.98)
V	50.64	-2015.76	-2036.69	-0.6724	-0.6785	-1898.18
	(37.9)	(523.35)	(502.83)	(0.2021)	(0.2354)	(868.38)
VI	80.00	-2274.45	-2314.10	-0.6378	-0.658	-2232.97
	(36.39)	(484.14)	(470.82)	(0.1972)	(0.2385)	(1015.80)
VII	94.15	-2446.52	-2497.98	-0.6357	-0.6601	-2533.29
	(36.96)	(433.80)	(423.53)	(0.1672)	(0.2359)	(1029.73)
I to VII	34.66	-1853.35	-1868.10	-0.6408	-0.6607	-1734.96
	(35.95)	(454.16)	(443.30)	(0.2144)	(0.2340)	(684.42)
Baseline Mean	265.26	8270.97	8542.24	2.3188	2.1899	12719.54

Notes: Data source is TransUnion. This table presents the estimated effects on consumer outcomes based on our synthetic difference-in-differences (SDID) specification in Equation (2) for the subset of consumers classified as Exact Minimum Payers pre-policy. The first set of estimates show the effects for each phase $j \in \{I, ..., VII\}$ of the policy, the δ_j^{PHASE}. The final set of estimates, labeled "POST (I to VII)," show the effects of the policy pooled across policy Phases I to VII. Each policy phase raises the minimum payment requirement by 50 basis points, from 2% in August 2019 (Phase I) to 5% in August 2025 (Phase VII). Each column shows estimates for a different outcome, and the final row of each column displays the baseline mean for each outcome. The units of columns 1, 2, 3, and 6 are Canadian dollars. The units in columns 4 and 5 are in percentage points (pps). The outcome "Any Delinquency Transition" is a binary variable that takes a value of one if any of a consumer's credit card accounts transitions from being current in the previous month to being 30 or more days past due in this month. The outcome "Any Default Transition" is a binary variable that takes a value of one if any of a consumer's credit card accounts transitions to being 90 or more days past due in this month. Standard errors are shown in parentheses, calculated using placebo variance estimation.

Table B6: Synthetic difference-in-differences estimates for the effects of the policy on near minimum payers

Phase	Minimum Payment ($) (1)	Revolving Debt ($) (2)	Statement Balance ($) (3)	Any Delinquency Transition (pps) (4)	Any Default Transition (pps) (5)	Credit Limit ($) (6)
I	27.34	-121.82	-129.25	0.2413	0.0382	89.48
	(5.66)	(108.11)	(102.62)	(0.1432)	(0.0823)	(116.43)
II	23.87	-593.94	-581.36	0.1612	0.0397	-253.52
	(11.69)	(210.49)	(198.61)	(0.1712)	(0.0876)	(121.67)
III	29.00	-831.12	-833.70	0.0908	0.0020	-529.60
	(12.74)	(257.21)	(226.26)	(0.1219)	(0.0603)	(198.28)
IV	47.35	-1189.54	-1193.07	0.1170	-0.0112	-866.60
	(8.27)	(184.34)	(148.93)	(0.1898)	(0.0825)	(361.74)
V	71.66	-1527.93	-1538.04	0.2217	0.0331	-1240.02
	(7.26)	(195.64)	(188.50)	(0.2129)	(0.1013)	(534.14)
VI	99.11	-1873.07	-1887.88	0.2710	0.0582	-1675.23
	(3.87)	(251.17)	(253.95)	(0.1949)	(0.0991)	(696.70)
VII	111.38	-2088.59	-2095.82	0.2568	0.0584	-1981.85
	(5.33)	(292.46)	(292.33)	(0.2327)	(0.1017)	(767.42)
I to VII	55.18	-1117.33	-1121.9	0.1903	0.0295	-855.43
	(6.27)	(151.26)	(124.6)	(0.1701)	(0.0822)	(347.59)
Baseline Mean	196.40	6521.15	6874.71	1.6671	0.3397	10663.01

Notes: Data source is TransUnion. This table presents the estimated effects on consumer outcomes based on our synthetic difference-in-differences (SDID) specification in Equation (2) for the subset of consumers classified as Near Minimum Payers pre-policy. The first set of estimates show the effects for each phase $j \in \{I, ..., VII\}$ of the policy, the δ_j^{PHASE}. The final set of estimates, labeled "POST (I to VII)," show the effects of the policy pooled across policy Phases I to VII. Each policy phase raises the minimum payment requirement by 50 basis points, from 2% in August 2019 (Phase I) to 5% in August 2025 (Phase VII). Each column shows estimates for a different outcome, and the final row of each column displays the baseline mean for each outcome. The units of columns 1, 2, 3, and 6 are Canadian dollars. The units in columns 4 and 5 are in percentage points (pps). The outcome "Any Delinquency Transition" is a binary variable that takes a value of one if any of a consumer's credit card accounts transitions from being current in the previous month to being 30 or more days past due in this month. The outcome "Any Default Transition" is a binary variable that takes a value of one if any of a consumer's credit card accounts transitions to being 90 or more days past due in this month. Standard errors are shown in parentheses, calculated using placebo variance estimation.

Table B7: Synthetic difference-in-differences estimates for the effects of the policy on mixed payers

Phase	Minimum Payment ($) (1)	Revolving Debt ($) (2)	Statement Balance ($) (3)	Any Delinquency Transition (pps) (4)	Any Default Transition (pps) (5)	Credit Limit ($) (6)
I	18.84	-395.94	-357.11	0.2225	0.0796	-294.96
	(3.79)	(115.58)	(95.80)	(0.0974)	(0.0413)	(176.94)
II	22.83	-542.21	-475.45	0.0789	0.0370	-423.13
	(5.93)	(148.22)	(151.47)	(0.1298)	(0.0398)	(292.70)
III	35.50	-519.83	-475.49	0.0664	0.0279	-600.28
	(7.99)	(207.38)	(189.04)	(0.1149)	(0.0460)	(394.27)
IV	59.50	-711.53	-686.56	0.1236	0.0380	-981.88
	(12.05)	(273.27)	(266.17)	(0.1068)	(0.0465)	(556.41)
V	90.84	-845.45	-828.72	0.2010	0.0733	-1243.56
	(16.40)	(384.86)	(381.36)	(0.1484)	(0.0573)	(733.96)
VI	120.62	-1003.39	-996.37	0.2482	0.0857	-1630.13
	(21.40)	(455.98)	(450.08)	(0.1545)	(0.0664)	(924.45)
VII	135.89	-1107.23	-1106.99	0.2661	0.0846	-1939.57
	(23.48)	(496.48)	(481.01)	(0.1558)	(0.0718)	(1013.87)
I to VII	64.92	-708.49	-678.3	0.1664	0.0594	-957.77
	(11.10)	(259.41)	(249.39)	(0.1198)	(0.0477)	(545.52)
Baseline Mean	200.76	5530.06	6350.49	2.1580	0.5391	12114.82

Notes: Data source is TransUnion. This table presents the estimated effects on consumer outcomes based on our synthetic difference-in-differences (SDID) specification in Equation (2) for the subset of consumers classified as Mixed Payers pre-policy. The first set of estimates show the effects for each phase $j \in \{I, ..., VII\}$ of the policy, the δ_j^{PHASE}. The final set of estimates, labeled "POST (I to VII)," show the effects of the policy pooled across policy Phases I to VII. Each policy phase raises the minimum payment requirement by 50 basis points, from 2% in August 2019 (Phase I) to 5% in August 2025 (Phase VII). Each column shows estimates for a different outcome, and the final row of each column displays the baseline mean for each outcome. The units of columns 1, 2, 3, and 6 are Canadian dollars. The units in columns 4 and 5 are in percentage points (pps). The outcome "Any Delinquency Transition" is a binary variable that takes a value of one if any of a consumer's credit card accounts transitions from being current in the previous month to being 30 or more days past due in this month. The outcome "Any Default Transition" is a binary variable that takes a value of one if any of a consumer's credit card accounts transitions to being 90 or more days past due in this month. Standard errors are shown in parentheses, calculated using placebo variance estimation.

Table B8: Synthetic difference-in-differences estimates for the effects of the policy on full payers

Phase	Minimum Payment ($) (1)	Revolving Debt ($) (2)	Statement Balance ($) (3)	Any Delinquency Transition (pps) (4)	Any Default Transition (pps) (5)	Credit Limit ($) (6)
I	12.54	-60.16	33.73	0.0490	-0.0098	-29.91
	(1.70)	(24.59)	(36.61)	(0.0164)	(0.0042)	(189.10)
II	15.54	-136.57	-11.70	-0.0182	-0.0285	32.26
	(3.00)	(33.56)	(77.04)	(0.0196)	(0.0059)	(221.05)
III	25.45	-137.48	-98.80	-0.0478	-0.0375	-102.07
	(3.02)	(51.36)	(52.71)	(0.0203)	(0.0072)	(271.21)
IV	36.35	-186.31	-229.92	-0.0442	-0.0355	-491.49
	(3.43)	(65.34)	(79.48)	(0.0193)	(0.0067)	(439.00)
V	48.65	-251.28	-335.51	-0.0300	-0.0322	-925.86
	(3.67)	(93.40)	(117.60)	(0.0434)	(0.0078)	(683.86)
VI	60.38	-310.85	-421.68	-0.0201	-0.0316	-1512.62
	(3.27)	(120.58)	(158.63)	(0.0345)	(0.0091)	(985.40)
VII	65.31	-338.69	-484.24	-0.0129	-0.0314	-1824.27
	(3.31)	(133.93)	(171.27)	(0.0376)	(0.0105)	(1111.38)
I to VII	36.00	-194.46	-204.51	-0.0180	-0.0294	-621.85
	(2.90)	(64.67)	(69.63)	(0.0223)	(0.0062)	(514.77)
Baseline Mean	86.85	1086.17	1862.98	0.3522	0.0912	12965.71

Notes: Data source is TransUnion. This table presents the estimated effects on consumer outcomes based on our synthetic difference-in-differences (SDID) specification in Equation (2) for the subset of consumers classified as Full Payers pre-policy. The first set of estimates show the effects for each phase $j \in \{I, ..., VII\}$ of the policy, the δ_j^{PHASE}. The final set of estimates, labeled "POST (I to VII)," show the effects of the policy pooled across policy Phases I to VII. Each policy phase raises the minimum payment requirement by 50 basis points, from 2% in August 2019 (Phase I) to 5% in August 2025 (Phase VII). Each column shows estimates for a different outcome, and the final row of each column displays the baseline mean for each outcome. The units of columns 1, 2, 3, and 6 are Canadian dollars. The units in columns 4 and 5 are in percentage points (pps). The outcome "Any Delinquency Transition" is a binary variable that takes a value of one if any of a consumer's credit card accounts transitions from being current in the previous month to being 30 or more days past due in this month. The outcome "Any Default Transition" is a binary variable that takes a value of one if any of a consumer's credit card accounts transitions to being 90 or more days past due in this month. Standard errors are shown in parentheses, calculated using placebo variance estimation.

Table B9: Synthetic difference-in-differences estimates for the effects of the policy on balance-matchers

Phase	Minimum Payment ($) (1)	Revolving Debt ($) (2)	Statement Balance ($) (3)	Any Delinquency Transition (pps) (4)	Any Default Transition (pps) (5)	Credit Limit ($) (6)
I	39.64	-531.30	-471.07	0.2456	0.0981	-331.34
	(10.11)	(125.40)	(159.15)	(0.0681)	(0.0377)	(257.39)
II	40.89	-1000.97	-840.13	0.1324	0.0557	-416.28
	(19.21)	(196.91)	(246.97)	(0.1216)	(0.0389)	(383.48)
III	52.55	-1209.15	-1056.87	0.0589	0.0204	-510.41
	(17.25)	(245.20)	(223.56)	(0.1409)	(0.0235)	(461.96)
IV	79.14	-1569.95	-1418.54	0.0856	0.0094	-775.72
	(10.75)	(283.89)	(285.52)	(0.1499)	(0.0332)	(660.99)
V	114.23	-1828.43	-1669.44	0.1423	0.0507	-1072.99
	(9.95)	(421.16)	(432.72)	(0.1320)	(0.0233)	(884.85)
VI	152.27	-2026.63	-1872.87	0.1709	0.0489	-1485.85
	(12.58)	(543.57)	(554.32)	(0.1338)	(0.0262)	(1105.95)
VII	173.18	-2104.19	-1954.53	0.2015	0.0600	-1701.62
	(14.92)	(613.75)	(609.65)	(0.1448)	(0.0404)	(1206.13)
I to VII	88.06	-1426.92	-1286.44	0.1448	0.0484	-848.38
	(9.99)	(267.60)	(259.29)	(0.1219)	(0.0256)	(658.25)
Baseline Mean	267.78	8987.63	10515.39	1.0704	0.1283	21498.74

Notes: Data source is TransUnion. This table presents the estimated effects on consumer outcomes based on our synthetic difference-in-differences (SDID) specification in Equation (2) for the subset of consumers classified as Balance-Matchers pre-policy. The first set of estimates show the effects for each phase $j \in \{I, ..., VII\}$ of the policy, the δ_j^{PHASE}. The final set of estimates, labeled "POST (I to VII)," show the effects of the policy pooled across policy Phases I to VII. Each policy phase raises the minimum payment requirement by 50 basis points, from 2% in August 2019 (Phase I) to 5% in August 2025 (Phase VII). Each column shows estimates for a different outcome, and the final row of each column displays the baseline mean for each outcome. The units of columns 1, 2, 3, and 6 are Canadian dollars. The units in columns 4 and 5 are in percentage points (pps). The outcome "Any Delinquency Transition" is a binary variable that takes a value of one if any of a consumer's credit card accounts transitions from being current in the previous month to being 30 or more days past due in this month. The outcome "Any Default Transition" is a binary variable that takes a value of one if any of a consumer's credit card accounts transitions to being 90 or more days past due in this month. Standard errors are shown in parentheses, calculated using placebo variance estimation.

Table B10: Synthetic difference-in-differences estimates for the effects of the policy on non-balance-matchers

Phase	Minimum Payment ($) (1)	Revolving Debt ($) (2)	Statement Balance ($) (3)	Any Delinquency Transition (pps) (4)	Any Default Transition (pps) (5)	Credit Limit ($) (6)
I	45.09	-710.90	-625.90	0.2313	0.0193	-316.81
	(14.10)	(130.92)	(96.80)	(0.0899)	(0.0487)	(464.60)
II	41.65	-1081.71	-944.23	0.0858	-0.0184	-538.55
	(15.64)	(144.11)	(171.42)	(0.1235)	(0.0368)	(604.39)
III	55.85	-1124.26	-992.41	0.0495	-0.0315	-791.62
	(12.60)	(209.89)	(191.76)	(0.1038)	(0.0265)	(662.23)
IV	89.98	-1406.47	-1261.70	0.0841	-0.0333	-1031.89
	(9.15)	(326.02)	(339.83)	(0.1082)	(0.0277)	(912.78)
V	130.80	-1613.65	-1481.32	0.1484	0.0028	-1301.59
	(12.44)	(530.47)	(549.64)	(0.1371)	(0.0383)	(1172.11)
VI	167.87	-1864.56	-1741.14	0.2243	0.0144	-1727.66
	(18.70)	(662.27)	(673.04)	(0.1507)	(0.0434)	(1397.39)
VII	187.00	-1965.14	-1826.01	0.2258	0.0186	-2045.20
	(21.33)	(722.07)	(706.09)	(0.1650)	(0.0543)	(1402.79)
I to VII	97.26	-1359.17	-1232.19	0.1451	-0.0055	-1048.28
	(8.97)	(319.06)	(313.79)	(0.1158)	(0.0276)	(910.07)
Baseline Mean	255.53	8324.91	10042.76	2.1333	0.2991	23890.35

Notes: Data source is TransUnion. This table presents the estimated effects on consumer outcomes based on our synthetic difference-in-differences (SDID) specification in Equation (2) for the subset of consumers classified as Non-Balance-Matchers pre-policy. The first set of estimates show the effects for each phase $j \in \{I, ..., VII\}$ of the policy, the δ_j^{PHASE}. The final set of estimates, labeled "POST (I to VII)," show the effects of the policy pooled across policy Phases I to VII. Each policy phase raises the minimum payment requirement by 50 basis points, from 2% in August 2019 (Phase I) to 5% in August 2025 (Phase VII). Each column shows estimates for a different outcome, and the final row of each column displays the baseline mean for each outcome. The units of columns 1, 2, 3, and 6 are Canadian dollars. The units in columns 4 and 5 are in percentage points (pps). The outcome "Any Delinquency Transition" is a binary variable that takes a value of one if any of a consumer's credit card accounts transitions from being current in the previous month to being 30 or more days past due in this month. The outcome "Any Default Transition" is a binary variable that takes a value of one if any of a consumer's credit card accounts transitions to being 90 or more days past due in this month. Standard errors are shown in parentheses, calculated using placebo variance estimation.

Table B11: Synthetic difference-in-differences estimates for the heterogeneous effects of the policy on credit card utilization for Phase VII

A. By Transacting Status

Phase	All (1)	Revolver (2)	Transactor (3)
VII	0.39	1.32	-0.07
	(0.76)	(1.16)	(0.78)
Baseline Mean	29.82	35.20	10.64

B. By Credit Score

Phase	Subprime (1)	Near Prime (2)	Prime (3)	Prime Plus (4)	Superprime (5)
VII	7.25	-2.01	-2.53	-1.03	0.25
	(3.02)	(1.24)	(1.04)	(0.66)	(0.25)
Baseline Mean	65.42	57.60	47.55	26.29	11.89

C. By Payer Type

Phase	Exact Min. Payer (1)	Near Min. Payer (2)	Mixed Payer (3)	Full Payer (4)
VII	-3.56	-4.08	-0.13	-1.47
	(1.49)	(0.98)	(2.38)	(0.82)
Baseline Mean	66.78	69.22	56.60	18.57

D. By Balance-Matching

Phase	Balance-Matcher (1)	Non-Balance-Matcher (2)
VII	-4.99	-3.01
	(1.62)	(1.58)
Baseline Mean	54.95	50.61

Notes: Data source is TransUnion. Estimated effects on consumer outcomes using our synthetic difference-in-differences (SDID) estimation on credit card utilization, with units in percentage points. Utilization is defined for each consumer as the sum of statement balances across their credit cards held divided by the sum of credit limits, also across their cards. Consumers with a zero credit limit are assigned a utilization of 100% to prevent being dropped from such regressions. Estimates are for the effects during Phase VII of the policy by baseline groups. Panel A report outcomes across all consumers in column (1), and by pre-policy transacting status in columns (2) and (3). Panel B report outcomes by pre-policy credit score: the columns are subprime (<600), near prime (600-699), prime (700-769), prime plus (770-829), and superprime (830+). Panel C reports outcomes by pre-policy payer type. Panel D report outcomes by pre-policy balance-matching status. Standard errors are shown in parentheses and are calculated using placebo variance estimation.

Table B12: Mean portfolio of a credit card issuer by their compliance status during policy Phase I

	Just-comply (1)	Over-comply (2)	Already-comply (3)
Mean Transactors (%)	42.2	48.3	43.2
Transactors (mn)	0.175	0.303	0.127
Mean revolving balance ($)	1,792	1,379	1,040
Revolving balances ($ mn)	990	1,101	544
Mean statement balance ($)	2,354	2,037	1,551
Statement balances ($ mn)	1,280	1,643	1,764
Accounts (mn)	0.575	0.846	1.163

Notes: Each cell in this table displays mean credit card issuer Quebec portfolio characteristics using data in July 2018 for three mutually exclusive and exhaustive groups of credit card issuers. "Just-comply" contains the two credit card issuers who just comply with the policy Phase I setting their minimum payment formulas to the lowest allowed: issuers A and B in Table 1. "Over-comply" contains the five credit card issuers who set their minimum payment formulas above the lowest allowed: issuers C to G in Table 1. Finally, "Already-comply" contains the four credit card issuers who pre-policy Phase I already had their minimum payment formulas at or above the lowest allowed: issuers H to K in Table 1. One issuer is excluded from the first four rows of column (3) as it does not furnish actual payments information required to calculate transactors or revolving debt.

C Decomposing the Effect on Minimum Payments

We separate the change in minimum payments driven by the change in an issuer's minimum payment formula from the change driven by consumers responding to the policy to pay down their balances. To do so, we construct, for each policy phase j, a counterfactual minimum payment ($\hat{m}_{i,t}$) at the card-month (i,t) level:

$$\hat{m}_{i,t} = \max\left\{ f_l^j \, b_{i,t}, \; \$10 \right\}. \tag{18}$$

The rate f_l^j is the actual minimum payment formula of issuer l in Quebec during phase j, as in Table 1, which is applied to observed balances ($b_{i,t}$) at all dates so that $\hat{m}_{i,t}$ includes over-compliance. We construct $\hat{m}_{i,t}$ for cards in all provinces. For cards outside Quebec, it is the minimum that would have applied under Quebec's phase j formula. We then aggregate to the provincial-level consumer means to use $\hat{m}_{p,t}$ as an outcome in our phased SDID approach (with the same SDID weights) to estimate $\delta_j^{PHASE}(\hat{m}_{p,t})$, the *balance channel* effect to capture debt paydown: when the formula is held fixed and only balances move.

Writing $g = \hat{m}_{p,t} - m_{p,t}$ for the gap between the constructed and observed minimum, the total effect on minimum payments decomposes exactly as:

$$\delta_j^{PHASE}(m_{p,t}) = \delta_j^{PHASE}(\hat{m}_{p,t}) + \underbrace{\left[\bar{y}_j^{SQC}(g) - \bar{y}_{\text{baseline}}^{SQC}(g)\right]}_{\tilde{M}_j(\text{mechanical})} + \underbrace{\left[\bar{y}_{\text{baseline}}^{QC}(g) - \bar{y}_j^{QC}(g)\right]}_{\tilde{A}_j(\text{Quebec wedge})}, \tag{19}$$

where $\bar{y}_j$ and $\bar{y}_{\text{baseline}}$ denote means during policy phase j and pre-policy SDID baseline, respectively. The mechanical term, $\tilde{M}_j$, is the growth of the formula-versus-observed gap in synthetic Quebec; the wedge, $\tilde{A}_j$, is the residual part of Quebec's increase not accounted for by the formula applied to balances; the wedge primarily reflects differences in balance levels.

D Welfare: Identification, Supply Adjustment, and Robustness

This appendix provides additional details on the sufficient statistics approach for evaluating welfare that includes accounting for a supply response.

D.1 Framework and calibration equation

The internal calibration needs the map from a debt response to a bias. A type-θ borrower chooses revolving debt D at $t = 1$ to carry to $t = 2$ at gross interest $1 + r$ under quasi-hyperbolic preferences and CRRA utility, with decision-self first-order condition $u'(c_1) = \beta\delta(1 + r)u'(c_2)$ and normative criterion $\beta = 1$ (Ericson and Laibson, 2019). Normalizing by $u'(c_1)$ gives the money-metric marginal internality in eq. (16).

Liquidity value of unused credit. To give the limit a role in the borrower's problem, we add a reduced-form insurance value of the unused line, $v(L - D)$ with $v' > 0 > v''$. Unused credit buffers future expenditure shocks, which is why borrowers respond to limit changes even far from their limits (Gross and Souleles, 2002; Aydin, 2022). The first-order condition becomes $u'(c_1) = \beta\delta[(1 + r)u'(c_2) + v'(L - D)]$, so the limit enters an interior borrower's problem directly and the resulting $\partial D/\partial L \in (0, 1)$: a limit cut lowers debt even far from the limit, with magnitude governed by the buffer motive. When the buffer is proportional to the limit, $D = \alpha(\theta)(1 - m)L$, the demand and supply models agree on the supply-driven channel, and the decomposition in eq. (22) is the total differential of this single first-order condition. Two features keep the arithmetic conservative: with $v' \geq 0$ the true wedge exceeds γ, so $\gamma \approx 1 - \beta$ is a lower bound; and omitting residual v-terms from the linearization biases $\hat{\beta}$ toward one, understating the internality again. A third feature ensures consistency: the same $v(\cdot)$ subtracted from the internality prices the access loss $\hat{\Lambda}^{\text{cut}} \approx v'|\Delta L|$ (Section D.3), so the surplus removed from one side of the ledger reappears on the other rather than vanishing.

Differencing and linearizing the log first-order conditions yields the calibration equation, evaluated at ΔD^{ident}:

$$\ln \beta(\theta) \;\approx\; -\sigma\, \Delta D^{\text{ident}}(\theta) \left[\frac{1 + r}{c_2(\theta)} + \frac{1}{c_1(\theta)} \right]. \tag{20}$$

Focal cell throughout: $\sigma = 2$ (matching $\hat{\rho} = 1.94$ in Laibson et al., 2026; RRA in this literature spans 1–2, so $\sigma = 1$ brackets the lower end), $r = 0.20$, and $c_1 = c_2 =$ \$32,672 (half the Statistics Canada, 2025 mean-consumption). The resulting $\hat{\beta}$ measure the strength of the behavioral mechanism that shifts debt, expressed in discount-factor units, rather than time preferences. They are a robustness check on the external-β calculation rather than estimates of β.

D.2 Supply adjustment

Baseline: no supply adjustment Treating the entire Phase VII deleveraging of the unconstrained groups as behavioral, eq. (20) delivers $\hat{\beta} \approx 0.75$–0.86 ($\hat{\gamma} \approx 0.14$–$0.25$) and a break-even of:

$$\Lambda^{be}_{\text{baseline}} = \$54 \text{ per consumer} \qquad (\approx \$315 \text{ million over 5.83m cardholders}). \tag{21}$$

The internal $\hat{\beta}$ range (0.75–0.86) is similar to two of the three external estimates (0.55, 0.74, 0.83), so two identification strategies resting on entirely different variation—behavioral deleveraging here, external moments in the main text—largely agree on where the bias sits. The identifying premise, however, that these groups' budget sets are unchanged, fails on the supply side: the same groups whose deleveraging is read as bias had their limits cut.

The supply response and the identification problem For every calibration group the credit-limit effect is negative and grows over time. At Phase VII, the cuts are −\$1,982 and −\$1,940 for near-minimum payers and mixed payers, the first significant in every phase from II onward and the latter of comparable magnitude but less precise. The contraction is broad-based and sharper elsewhere in the data: exact-minimum payers see a Phase VII cut of −\$2,533, significant at 5% in every phase (Table B5), and by credit score the cuts are significant across all groups except superprime transactors (Table B2, Panel F).

A binding limit reduction is a budget-set contraction. We can decompose the observed revolving-debt response of an unconstrained group into a behavioral component and a supply-driven response to the limit cut:

$$\underbrace{\Delta D^{\text{obs}}(\theta)}_{\text{Tab. B6 and B7, col. (2)}} = \underbrace{\Delta D^{\text{bias}}(\theta)}_{\text{enters eq. (20)}} + \underbrace{\frac{\partial D}{\partial L}\,\Delta L(\theta)}_{\text{supply-driven, remove}} . \tag{22}$$

The unadjusted calibration sets the supply-driven term to zero. Because both ΔD^{obs} and ΔL are negative, ignoring it attributes supply-driven deleveraging to bias, overstating γ and the break-even. The surplus removed does not vanish; it is a rationing-driven reduction in borrowing whose consequence belongs in Λ.

The bias must be identified where deleveraging is voluntary; the welfare level is the long-run quantity unwound. We therefore identify β^{clean} on an uncontaminated response and apply the resulting γ to the Phase VII level, $\gamma(\beta^{\text{clean}}(\theta)) \cdot |\Delta D^{\text{VII}}(\theta)|$. The two corrections below differ only in how the clean response is obtained.

Correction 1: Phase window isolation The supply-driven term vanishes in any window where $\Delta L \approx 0$, and the phase structure supplies one: limit cuts load late, deleveraging begins immediately. Phase-I limit effects are +\$89 (near-minimum: the limit *rose*) and −\$295 (mixed), against terminal cuts near −\$2,000. Identifying on the Phase I debt response (−\$122 and −\$396) for near-minimum and mixed payers is a strict lower bound on the behavioral response. We value the full long-run debt reduction at the bias measured in the clean window: a dollar of debt the long-run self did not want is worth removing whether the borrower chose to remove it or the limit cut pushed her to, while the harm from the limit cuts themselves remains counted in Λ. This approach estimates $\hat{\beta}^{\text{clean}} \approx 0.95$–$0.98$ and a break-even of \$14 (26% of baseline).

Correction 2: supply-driven response subtraction The second correction identifies on the full Phase VII response purged of its supply-driven component, $\Delta D^{\text{ident}} = |\Delta D^{\text{VII}} - (\partial D/\partial L)\,\Delta L^{\text{VII}}|$, with γ applied to the Phase VII level. The MPB $\partial D/\partial L$ is not estimated from the treated groups, which would be circular; we bracket it across two sources and report the range.

(a) Model-implied. The Section 4.3 borrowing rule $D = \alpha(\theta)(1-m)L$ implies an MPB of $\partial D/\partial L = \alpha(\theta)(1-\bar{m}_T)$. Imputing $\alpha(\theta)$ from each group's baseline revolving debt utilization (0.61 near-minimum, 0.45 mixed) and evaluating at $\bar{m}_T = 5\%$ gives MPBs of 0.58 (near-minimum) and 0.43 (mixed).[16] The supply-driven shares are substantial—55% (near-minimum) and 76% (mixed)—and the break-even falls to \$18 (34% of baseline; Table D1).

(b) Externally estimated. Agarwal et al. (2018) provide quasi-experimental estimates of the same MPB showing that they decline in credit score: 0.59 for the lowest credit scores and approximately 0 for the highest. We map these external estimates to our credit score groups (0.59 for subprime and near prime, 0.28 for prime, 0 for prime plus and superprime) and weight each payer type by its score composition. This gives a break-even of \$23 (43% of the baseline; Table D1).

[16] Only the ΔL channel is imported. The rule's Δm channel ($\partial D/\partial m = -\alpha L$) describes repayment *at* the minimum and does not apply to groups that by construction pay above it.

D.3 The money-metric welfare statement

Aggregating across types, the per-period welfare change is the internality-correction rectangle, net of the smoothing-distortion triangle and the net cost of rationed access:

$$\Delta W = \sum_{\theta} \Big[\underbrace{\gamma(\theta)\big(-\Delta D^{\mathrm{VII}}\big)}_{\text{internality correction}} - \underbrace{\tfrac{1}{2}\kappa(\theta)\big(\Delta D^{\mathrm{VII}}\big)^2}_{\text{smoothing distortion}} \Big] \phi(\theta) - \underbrace{\Lambda}_{\text{net access loss}} . \tag{23}$$

Relative to the baseline of Appendix D.2, γ is now calibrated from the clean identifying response and the removed supply component is carried into Λ. A further omission makes every reported break-even an upper bound: for borrowers whose payment capacity sits near or below the new floor, minimums forced above capacity trigger late fees and interest that capitalize into balances (d'Astous and Shore, 2017; Castellanos et al., 2026)—the same payment-capacity stress the Section 4.3 default function prices for issuers, here borne by consumers. This is consistent with subprime consumers facing the largest minimum-payment increases while showing an insignificant debt decline. Neither term in eq. (23) captures this cost. We expect this deduction to be too small to materially affect our welfare estimates: the policy-induced increase in delinquency is a fraction of a percentage point, so the implied incremental fee flow is under \$1 per consumer-year, based on our estimates from Section 5.1.

Criterion choices. We evaluate consumer welfare rather than total surplus. Two of the affected terms are transfers we treat conservatively: the interest consumers save is issuer revenue lost, which we do not count (though its incidence toward lower-income revolvers would add a progressive term under distributional weights), and the fee-capitalization flow above, though also a transfer, is charged as a loss because it falls on constrained borrowers. The one choice that is *not* conservative is excluding issuer profits: a total-surplus criterion would charge the forgone margin $(r - c)\,\Delta D$ against the internality gain, a charge that grows with issuer market power (Herkenhoff and Raveendranathan, 2025; Drechsler et al., 2025). Finally, the welfare-relevant object is the change in consumption, not debt (Choukhmane and Palmer, 2026). If paydown was financed from savings or other credit rather than forgone consumption, $\gamma \cdot (-\Delta D^{\mathrm{VII}})$ overstates the internality-correction benefit; but such financing generates an offsetting pecuniary gain we do not count—the spread between the revolving rate and the return on the funds drawn down, accrued over the counterfactual life of the balance—as well as any under-anticipated non-pecuniary costs of indebtedness that paydown removes.

The smoothing distortion and the access cost. The no-distress evidence allows us to assume $\kappa \approx 0$ for the interior deleveraging but not necessarily for borrowers whose limits were involuntarily cut. We therefore subject the limit-cut population to a pessimistic stress test that treats their supply-driven deleveraging as harm to rational borrowers, charging it the smoothing-distortion triangle $\frac{1}{2}\kappa(\Delta D^{\text{mech}})^2$ with $\kappa = \sigma[(1+r)/c_2+1/c_1]$ given the same linearization as eq. (20) and the model-implied supply-driven component. The charge is \$14 per consumer.

D.4 Result

Proposition 1 (Supply-adjusted break-even) *Fix the internally calibrated bias from eq.* (20) *and the estimated debt responses. Bill 134 raises aggregate welfare in eq.* (23) *if and only if the residual per-consumer access cost satisfies* $\Lambda - \hat{\Lambda}^{cut} < \Lambda^{be}$*. Because the correction lowers* γ*, the supply-adjusted* Λ^{be} *is below the unadjusted baseline.*

Appendix Table D2 collects the estimates. Correction 1 puts the internal break-even at \$14; correction 2 spans \$18–\$23 across MPB approaches; lying below the \$54 baseline, and below the external-β thresholds of Table 7. The substantive lesson is that the \$54 baseline reflects identifying the bias on the Phase VII response—the most supply-contaminated window; once identification moves to where the budget set is unchanged, the welfare case is real but thinner. The welfare *sign* survives every specification: roughly \$14 to \$148 across all combinations of how the bias is obtained, the structural β range, and how the supply component is removed.

D.5 Sensitivity to extending the internality benefit to other groups

The headline aggregation assumes a zero internality benefit to the consumer types: full payers and exact min. payers types. Table D3 shows sensitivity to changing this assumption: showing results that only include near min. payers, and then cumulatively including mixed payers, full payers, and exact min. payers. Full payers show a significant Phase VII decline (Appendix Table B8), and exact-minimum payers also deleverage with delinquency and default transitions declining (Appendix Table B5)—the opposite of binding constraints—so both responses plausibly run toward the long-run optimum. Extending to all payer types noticeably increases the break-even threshold.

Table D1: Internal calibration: β identified on a clean response, γ applied to the Phase VII long-run level

	ΔD^{ident} (\$)	ΔD^{VII} (\$)	$\hat{\beta}$	$\hat{\gamma}$ (per \$)	Supply share
Baseline (supply-unadjusted; Phase VII identifies and scales)					
Near Min. Payer	2,089	2,089	0.75	0.25	—
Mixed Payer	1,107	1,107	0.86	0.14	—
Correction 1 (Phase I clean window)					
Near Min. Payer	122	2,089	0.98	0.02	limit rose
Mixed Payer	396	1,107	0.95	0.05	n/a
Correction 2a (model-implied MPB)					
Near Min. Payer	937	2,089	0.88	0.12	55%
Mixed Payer	266	1,107	0.96	0.04	76%

Notes: Focal cell as in Appendix D.1. $\hat{\beta}$ from (20) at ΔD^{ident}; the welfare benefit is $\hat{\gamma} \cdot \Delta D^{\text{VII}}$. Correction 1 identifies on the Phase I response, where $\Delta L \approx 0$ (for near-minimum payers the limit rose, so the Phase I response is a strict lower bound on the behavioral component). Correction 2a identifies on the Phase VII response minus $\alpha(\theta)(1-\bar{m}_T)\Delta L^{\text{VII}}$, where the marginal propensity to borrow (MPB) $\alpha(\theta)(1-\bar{m}_T)$ equals 0.58 for near min. payers and 0.43 for mixed payers (baseline revolving debt utilizations $\alpha = 0.61$ and 0.45). The external-MPB variant 2b is in Table D2. "Supply share" is the fraction of the Phase VII response removed as supply-driven.

Table D2: Supply-adjusted break-even access cost Λ^{be} (per consumer, CAD, $\sigma = 2$)

Calibration	Λ^{be} (\$)	% of baseline
Baseline (supply-unadjusted)	54	100%
Correction 1 (Phase I clean window)	14	26%
Correction 2 (supply-driven-response subtraction)		
2a: model-implied	18	34%
2b: external MPB	23	43%

Notes: The break-even access cost is per consumer in Quebec, not per consumer who loses access. Each entry is the focal-cell break-even from (23) (with $\kappa = 0$) aggregated over the near-minimum and mixed payer types. Correction 1 identifies β on the Phase I response and applies γ to the Phase VII level; Correction 2 identifies on the Phase VII response minus $(\partial D/\partial L)\Delta L^{\text{VII}}$, with the marginal propensity to borrow (MPB) from the Section 4.3 borrowing rule (2a) or from external quasi-experimental estimates (2b), as described in Appendix D.2.

Table D3: Sensitivity of break-even access cost Λ^{be} (per consumer, CAD) to including non-zero internality benefit for exact min. payers and full payers

	No supply correction			External			Model-implied		
β :	0.55	0.74	0.83	0.55	0.74	0.83	0.55	0.74	0.83
Near Min. Payers	36	23	14	21	13	9	16	9	6
+ Mixed Payers	148	85	56	54	31	20	43	25	16
+ Full Payers	259	150	98	107	62	41	106	61	40
+ Exact Min. Payers	270	156	102	114	66	43	110	64	42

Notes: The break-even access cost is per consumer in Quebec, not per consumer who loses access. Column headers are β. Rows cumulatively add each payer type to the aggregation in eq. (17) at its Table 3 share; the second row is the headline aggregation and the final row covers the full payer-type partition. The no supply correction columns use each group's Phase VII revolving-debt response: -\$2,089 for near min., -\$1,107 for mixed, -\$339 for full, and -\$2,447 for exact min. payers. The external (group-specific) columns net $(\partial D/\partial L)\Delta L^{\mathrm{VII}}$ by applying the Agarwal et al. (2018) credit score group marginal propensity to borrow (MPB) to our data based on the credit score distribution of each payer type.The model-implied columns net $\alpha(\theta)(1-\bar{m}_T)\Delta L^{\mathrm{VII}}$ using group MPBs of 0.58/0.43/0.08/0.62 for near min./mixed/full/exact min. payers, implied by baseline revolving debt utilizations $\alpha = 0.61/0.45/0.08/0.65$ evaluated at $\bar{m}_T = 5\%$.