Evaluating Credit Card Minimum Payment Restrictions

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Abstract

We study a policy that increased credit card minimum payments in Quebec but left them unchanged in the rest of Canada. We estimate the causal effect of restricting repayment choices by applying a synthetic difference-in-differences methodology to comprehensive Canadian consumer credit reporting data. We study the dynamics of the policy, quantifying short-run and long-run effects. The policy causes a persistent increase in minimum payments of 52 percent, and has trade-offs. The policy reduces revolving debt by 16 percent in the long-run, with the effect growing over time. However, we also document a 15 percent increase in borrowers transitioning into delinquency in the long-run. This increase does not appear to translate into higher default rates. Finally, the policy permanently reduces access to credit cards with fewer new cards opened and lower limits on existing cards.

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1 Introduction

A key challenge for consumer financial protection is what to do when disclosure regulation and nudges are ineffective at achieving socially efficient improvements in consumer outcomes. A controversial option is to impose hard paternalistic policies that restrict consumer choice (Campbell, 2016; Laibson, 2020; Campbell and Ramadorai, 2025). Doing so requires estimating the trade-offs of such policies across consumer groups, and then making a policy evaluation to determine whether the benefits of restricting choices outweigh the costs.

We evaluate the effectiveness of hard paternalistic regulation in the context of the Canadian credit card market. In 2019, the province of Quebec introduced consumer protection legislation (Bill 134) that increased required monthly minimum credit card payments, aiming "to prevent over-indebtedness".[1] The minimum payment on a credit card is the minimum amount a cardholder is required to pay to remain in good standing with their card issuer. Increasing the minimum repayment, therefore, lowers the share of revolving debt a borrower can carry.

High levels of credit card debt increase consumer fragility, and, because interest rates are high, an increase in debt leads to large interest payments, which can be a drag on economic activity. Credit card debt also appears to arise, in many instances, from financial illiteracy (e.g., Ausubel, 1991; Soll et al., 2013; Lusardi and Tufano, 2015; Seira et al., 2017; Adams et al., 2022), and consumers making a variety of behavioral mistakes (as reviewed in Beshears et al., 2018; Gomes et al., 2021). Policymakers might therefore want to internalize this tendency when forming regulation. Forcing credit cardholders to pay more of their credit card balance each month is one way policymakers can attempt to reduce credit card debt.

Increasing minimum payments, however, may be costly. Credit cards are a form of insurance, and so forcing consumers who are temporarily liquidity-constrained into delinquency is inefficient, and trigger fees, which may increase debt. Theoretically, increasing credit card minimum payments can have ambiguous (and heterogeneous) effects on consumers (e.g., Castellanos et al., 2025). Increasing the minimum payment reduces consumers' flexibility in managing their monthly payments. On the issuer side, it can also make some lending unprofitable, and therefore change who gets access to credit. By reducing the amount of interest an issuer can collect from some borrowers, issuers might prefer to restrict access, forcing vulnerable households to use more expensive forms of credit. We therefore need to empirically estimate the trade-offs of reducing revolving debt compared to restricting the insurance benefits provided by credit cards.

In this paper, we study the effects of Quebec's minimum payment policy. Bill 134 requires that, starting in August 2019, credit card minimum payments must be at least 2% of the outstanding balance for all cards opened before August 2019—phase I. For these "existing cards", minimum payment requirements increase by 50 basis points in August of each year from 2020 to 2025 (phases II-VII), when they reach 5% of the outstanding balance. Bill 134 also requires

[1] Legislative changes can be found here: http://m.assnat.qc.ca/en/travaux-parlementaires/projets-loi/projet-loi-134-41-1.html and here: http://www2.publicationsduquebec.gouv.qc.ca/dynamicSearch/telecharge.php?type=5&file=2017C24A.PDF

that, for cards opened starting in August 2019 ("new cards"), credit card minimum payments must be at least 5% of the outstanding balance.

Our setting is ideal for informing policymakers in developed credit card markets. Quebec is the second most populous Canadian province and 89% of adult Quebec residents hold at least one credit card (Statistics Canada, 2019).[2] Before Bill 134, minimum payments across Canada are at a baseline *below* other developed countries with widespread use of credit cards and substantial credit card debt, such as the U.S. and the U.K., and Bill 134 tightens the minimum payment in Quebec to substantially *above* such levels.

We evaluate the trade-offs by measuring the effects of Quebec's minimum payment policy on credit card revolving debt—statement balance less payments—transitions into credit card delinquency, default, and credit access. We primarily use comprehensive consumer credit reporting data from TransUnion containing monthly anonymized account-level information on credit cards held by all Canadian credit cardholders between 2018 and 2024. We complement this with data from Mintel Comperemedia on credit card offers.

We estimate the effects of Bill 134 on consumers using a synthetic difference-in-differences (SDID) design. The policy affects only credit card minimum payments of cardholders in the province of Quebec. We construct a control group using data from eight other Canadian provinces that are unaffected by Quebec's policy. The SDID approach is a blend of the synthetic controls approach, which is natural for cases such as ours where only one geographical area, Quebec, is treated, and the difference-in-differences (DID) approach commonly used by researchers. Arkhangelsky et al. (2021) and Arkhangelsky and Imbens (2024) demonstrate that SDID typically outperforms both synthetic controls and DID approaches. Our paper provides an example for how the SDID methodology can be used for policy evaluation. We show that one set of SDID weights appears to construct a reliable counterfactual for evaluating the effects of a policy across multiple outcomes. Our results are also robust to estimating effects using a DID approach on consumer-level disaggregated data.

We find that Bill 134 immediately and persistently shifts the distribution of minimum payments such that higher minimum payments are more common. In the very short run, this effect is mechanical for borrowers who carry a monthly balance ("revolvers"). Before the policy, 46.4% of all cards in Quebec required a minimum payment of less than 2% of outstanding balances. When Bill 134 is implemented the minimum increases to 2%, and so revolvers experience a short-run impact on their outstanding balances. We estimate a $15.5 average increase in credit card minimum payments in the month that the policy was introduced, which is a 13.3% increase on the pre-policy Quebec baseline mean. The effect persists and accumulates to a $125 average increase in minimum payments over the first seven statements.

We estimate that phase I of the policy reduced the amount of credit card revolving debt in Quebec. Six months after phase I is introduced revolving debt is $185 lower: a 7.7% decline

[2]Appendix A contains additional descriptive survey evidence of credit card behaviors in Quebec and Canada using data from Statistics Canada's Survey of Financial Security.

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 26.8% one month post-policy. We find no clear evidence that these transitions translate into increased defaults (measured as 90+ days past due). This indicates that any delinquency was temporary, potentially driven by inattention rather than severe liquidity constraints.

The long-run effects of Bill 134 are visible after five years of the policy, with an increase in consumers' minimum payments of $60.4 per month, representing a 51.7% increase from the baseline mean. Reductions in revolving debt are permanent and grow as minimum payment requirements tighten in August of each year. After five years, the policy led to a reduction in mean revolving debt of $380.3—a 15.8% decrease from the baseline mean. Transitions into delinquency increase by 15.3%, but again we see no clear evidence of an effect on defaults. Finally, we document that after 5 years, consumers in Quebec have less access to credit, with credit limits being $1,080 (8.5%) lower in Quebec after the introduction of the policy relative to the rest of Canada.

In addition to lower credit limits on existing cards, we find evidence that Bill 134 led to a reduction in the number of new cards offered and opened (credit access). After phase I in August 2019, there are relatively fewer new credit cards in Quebec, and cards that are issued have lower credit limits relative to the rest of Canada. This difference appears to partially reflect issuers anticipating the policy and encouraging cardholders in Quebec to open new credit cards earlier. Using Mintel Comperemedia data on credit card offers, we show that issuers concentrated their mailings in July 2019 to aggressively bring forward the timing of existing customers in Quebec opening new cards before the 5% policy takes effect. Just before August 2019, issuers' credit card offers in Quebec temporarily have lower interest rates, annual fees, and higher credit limits. It likely also reflects issuers rationing marginal consumers who are unprofitable at the new minimum payment requirements. We are unable to separate these effects.

Overall, we find that the increase in minimum payment requirements leads to a permanent reduction in revolving debt, increases in transitions into delinquency that does not appear to translate into increase defaults, and some credit rationing. How policymakers trade off these effects depends on how they measure consumer welfare. If consumers are present-biased, as is well-documented in the credit card market (e.g., Shui and Ausubel, 2004; Meier and Sprenger, 2010; Kuchler and Pagel, 2021), and the long-run self is the relevant welfare criterion, then the reduction in debt may be interpreted as welfare-improving. However, if the demand for credit is driven by borrower preferences, then tightening of credit access and reduced debt is only welfare-improving if the policymaker believes consumers are making behavioral mistakes.[3]

Our paper contributes to literatures spanning household finance, public economics, and behavioral economics by estimating the trade-offs of a paternalistic policy in a credit market. Allcott et al. (2022) provide theory and empirical evidence evaluating mistakes in the payday

[3]See Bernheim and Taubinsky (2018) and Ericson and Laibson (2019) for a discussion of these alternative approaches to measuring welfare. See Heidhues and Kőszegi (2010, 2015) for theory on the costs of naivete in the credit card market.

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.[4] Garber et al. (2024) examines how Brazil's promotion of payroll credit led consumers to accumulate high-interest debt. The resulting consumption decline and increased volatility suggest unsophisticated over-borrowing rather than rational consumption smoothing. DeFusco et al. (2020) shows that the effects of US mortgage leverage restrictions, which are designed to improve financial stability, come at a cost of restricting productive risk-taking. Heimer and Imas (2022) document how restricting retail traders' leverage improves these consumers' trading returns. Paternalistic policies are debated across a broad range of topics outside consumer financial protection; for example, see Allcott (2016) for a review of paternalism in energy efficiency policy and Allcott et al. (2019) for sugar taxes.

Our second contribution is to advance the literature on credit cards and consumer financial protection. Reducing credit card debt is known to be difficult. Prior research has found information disclosure requirements or nudging consumers is largely ineffective at reducing credit card debt (e.g., Agarwal et al., 2015b; Keys and Wang, 2016; Seira et al., 2017; Adams et al., 2022; Batista et al., 2025; Guttman-Kenney et al., 2025; Guttman-Kenney, 2026). Policies restricting shrouded late fees (Agarwal et al., 2015a) and raising interest rates over time (Nelson, 2025) have been effective at reducing borrowing costs but are not designed to reduce revolving debt. We contribute to the literature by studying a policy that *is* effective at reducing debt but restricts consumer choices, temporarily increasing delinquency, and permanently reducing credit access.

No prior work has estimated the effects of a market-wide policy forcing all credit card issuers to increase their minimum payments in a developed country. We study this topic in Canada, where 89% of adults hold a credit card, the highest fraction globally (World Bank, 2022). In developed countries, d'Astous and Shore (2017) and Keys and Wang (2019) study the effects of North American issuers voluntarily changing their minimum payment policies. Keys and Wang (2019) provides evidence that consumers commonly choose to pay at or just above the minimum payment, but their approach is not designed to estimate the effects on debt.[5] In developing countries, where only a minority of consumers use credit cards and default rates are substantially higher, three studies have investigated the effects of increasing minimum payments. Medina and Negrin (2022) examine the effect of one Mexican issuer voluntarily raising its credit card minimum payment. Castellanos et al. (2025) study the effect of one Mexican issuer voluntarily conducting a field experiment testing raising credit card minimum payments from 5% to 10% of the outstanding balance. Agarwal et al. (2023) research the effect of a nationwide policy in Turkey that increases minimum payments from 20% to 40% of the outstanding balance while

[4]See Melzer (2011), Bethune et al. (2024), and Cherry (2024) for examples of studies that examine the effects of interest rate restrictions on unsecured loans, and Agarwal et al. (2025b) that studies a ban on new unsecured debt for highly indebted consumers in Singapore. Many papers show that the credit card market has excess risk-adjusted returns (e.g., Agarwal et al., 2015b, 2018, 2025a; Herkenhoff and Raveendranathan, 2025; Nelson, 2025; Guttman-Kenney and Shahidinejad, 2025; Drechsler et al., 2025), consistent with market power.

[5]Indeed, Keys and Wang (2019) conclude "Developing more theory and evidence on optimal policy under consumer heterogeneity is an important area for future work."

also requiring consumers to pay at least half of their balance three or more times a year to continue using cash advances and credit limit increases. Turkey's policy would unlikely to be feasible in many countries.

The paper proceeds as follows. In Section 2, we describe the institutional details of minimum payments and the Quebec policy, the data we use, and our empirical methodology. Section 3 covers our results. This section shows how credit card issuers' policies changed in response to the policy, and our SDID estimated effects on consumers. Section 4 presents our results examining credit supply decisions. Section 5 briefly concludes.

2 Minimum Payments, Data, and Methodology

2.1 Minimum Payments

Minimum payments. Credit card interest is charged on balances net of payments, and 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 no further spending).[6] Katz et al. (2024) provide evidence that credit card issuers are incentivized to set "low" minimum payments, as doing so appears to yield higher profits through affecting the payment choices of behavioral consumers. Guttman-Kenney (2026) shows that credit cardholders frequently lack liquid cash and target paying at least the minimum payment.

Approximately 40% of Canadian (Statistics Canada, 2019), and 50% of American (Board of Governors of the Federal Reserve System, 2023) credit cardholders revolve part of their credit card debt every month, and most pay relatively high interest rates to borrow in this manner. There are strong economic incentives for cardholders to make at least the minimum payment. Doing so allows the borrower to avoid being charged late fees and interest on delinquent balances (Gathergood et al., 2020).[7] Furthermore, if a consumer 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 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 (e.g., Adams et al., 2022; Hirshman and Sussman, 2022). Consumers tend to "bunch" repayments at or just above minimum payment amounts (e.g., Keys and Wang, 2019; Medina and Negrin, 2022; Guttman-Kenney, 2026) rather than make larger repayments to reduce their level of debt. Such behavior is attributed to the minimum payment acting as a reference point that consumers target (e.g., Sakaguchi et al., 2022; Bartels et al., 2024; Schwartz, 2024; Katz

[6] Calculations using the Financial Consumer Agency of Canada's Credit Card Payment Calculator, and assuming an interest rate of 19.9%.

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

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 August 2024. 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.[8] 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 outstanding balance. For these existing credit cards that are still open in August 1, 2020, this requirement tightened minimum payments by an additional 50 basis points to at least 2.5% of the outstanding balance. Each year after 2020, for cards that remain open in August of that year, the minimum payment ratchets up by another 50 basis points, until August 1, 2025, when the minimum payment must be at least 5% of the outstanding balance. 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.[9]

The regulation also requires all credit cards opened starting August 1, 2019 ("new credit cards") to have a minimum payment of at least 5% of the outstanding balance. During our period of study (2018—2024), no other Canadian province imposed a minimum payment regulation (either in place or changed).

Household debt is a key policy issue in many countries. Canada is no exception. In 2018, consumer non-mortgage debt stood at over twenty-three thousand per person; in Quebec the average was $19,243. The overall objective of Quebec's regulation was to increase repayments and reduce credit card debt.[10] One of the architects of Bill 134, Quebec politician André Lamontagne, describes why they consider such interventions necessary: "Consumers, and in particular the most

[8] 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.

[9] 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."

[10] Also 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., 2015b; 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.

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 states the government's preference for consumers to reduce their credit card debt: "it is advantageous to pay the balance of your credit card each month, because no credit charges are then applicable."

Our Canadian setting is informative about minimum payment requirements as we start from a baseline where minimum payments are *below* standards currently set in other developed countries, and the Quebec policy changes that to substantially above these minimums. In the U.S., for example, credit card issuers are required to ensure non-negative amortization of their credit card accounts as part of broader "safety and soundness" supervision designed to ensure issuers are managing their credit risks. The simplest way to satisfy such a rule is to have a minimum payment of at least the maximum of (i) \$10, or (ii) 1% of the statement balance (before interest and fees) plus interest and fees. Discussions with US industry participants indicate that 1% is the lowest bound that amortizes debt that can be feasibly chosen by issuers to satisfy regulators. In the UK, issuers' minimum payment rules must be at least the maximum of £5 or 1% of the statement balance plus interest and fees. In Mexico, the minimum payment is required to be the greater of (i) 1.5% of the outstanding balance plus interest and fees, or (ii) 1.25% of the credit limit (Medina and Negrin, 2022).

2.2 Data

Canadian consumer credit reporting data. We use data from the Bank of Canada's anonymized consumer credit reporting data sourced from TransUnion. These include monthly data covering all Canadians with credit reports between 2012 and 2024, redacted of personal information.[11] We observe consumer-level information including age, 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 trade-line data that records monthly account-level information for each of their credit accounts. These data includes 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—for credit cards this is the 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 individual accounts over time.

Importantly, for our study, we observe consumers' actual monthly payments for nearly all

[11] To protect the privacy of Canadians, TransUnion did not provide any personal information to the Bank. The TransUnion dataset was anonymized, meaning it does not include information that identifies individual Canadians, such as names, social insurance numbers or addresses (with the exception of postal codes). See Gibbs et al. (2025) for guidelines on processing credit bureau data.

credit cards. Ten of the eleven credit card issuers furnish actual payments information to TransUnion. This enables us to accurately measure how much revolving debt a consumer carries to their next statement. This is a notable advantage relative to credit reporting data in the United States where actual payments information is missing for all of the largest credit card issuers since 2015 (Guttman-Kenney and Shahidinejad, 2025).

As with many other countries, including the U.K. and the U.S., 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 COVID-19, they likely reflect more than just the effects of Bill 134 on consumer credit card behavior.

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 credit card offers they receive in the mail. 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 January 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.[12]

2.3 Sample selection

Sample selection for existing cards. 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 82 calendar-year-months, $t \in \{-18, ..., 63\}$. These nine provinces cover 99.3% of Canada's population, and is similar in population to California.[13] Our 82 month panel starts 18 months before the Quebec's policy takes effect in August 2019 to 63 months after. The last month of data currently observed is December 2024. Our dataset contains 22.5 million consumers in Canada as of August 2019, and of these, 5.4 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 existing cards opened before August 2019. Closed accounts continue to be reported in our dataset. If a card closes during our data 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. When a card is closed, we classify the card

[12]Other uses of such Mintel data on credit card solicitations include Grodzicki (2022), Ru and Schoar (2020), and Gross et al. (2021).

[13]The remainder of the population lives in a small tenth province, Prince Edward Island, with a population of less than 200,000, and three territories with less than 50,000 residents in each.

as being current, unless the reporting indicates it was delinquent or defaulted when closed. We winsorize continuous variables to their 99.9 percentile. In cases where lenders start reporting previously-missing information on a card, we impute backwards, which, if anything, would be expected to mean that our estimates under-state any differences. In cases where a lender does not furnish updated information to TransUnion on a credit card's performance 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 the effects of Quebec's policy raising minimum payments to 5% on new cards opened from August 2019 onward. Currently, we sample all credit cards opened in Quebec and Ontario from July 2018 until January 2020 and aggregate them into cohorts based on the province and month of card opening. We calculate the month that a new credit card is opened based on the trade-line card opening date variable rather than the time a card first appears in the data. This is because it frequently takes a few months for new cards to appear in credit reports (Gibbs et al., 2025).

Outcomes. We measure our main outcomes in consumer credit reporting data as follows:

- **Minimum Payment** is observed in credit reporting data as the scheduled payment amount. This amount is inclusive of any interest and fees, as well as repayment of capital.
- **Revolving Debt** is defined in Equation 1, following the approach used in 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.

$$d_{i,t} \equiv \begin{cases} b_{i,t-1} - p_{i,t} & \text{if } b_{i,t} - p_{i,t} \geq 0 \\ 0 & \text{otherwise} \end{cases}$$

- **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. This is a signal that a consumer is experiencing some difficulties in meeting their minimum payment obligation. We show results for this outcome in basis points (bps).
- **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 30 or 60 days past due). This threshold is one that lenders use for assessing credit risk and is a proxy for charge-offs (Gibbs et al., 2025). We show results for this outcome in basis points (bps).

2.4 Empirical Methodology

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 difference-in-differences approach, the SDID approach constructs weights to match to pre-policy trends. In addition, unlike synthetic controls, it allows for causal effects to be accurately estimated even if there are differences in the levels of outcomes. As explained in Arkhangelsky et al. (2021), the SDID approach is the natural estimation method for our setting where only one geographical area is treated and there are differences in the levels of some outcomes. We evaluate the effects of changes in Quebec compared to a control group of other Canadian provinces. Our specification is as follows:

$$\left(\hat{\delta},\hat{\mu},\hat{\alpha},\hat{\beta}\right) = \underset{\delta,\mu,\alpha,\beta}{\operatorname{argmin}}\Big\{\sum_{p=1}^{9}\sum_{t=-18}^{63}\Big(y_{p,t}-\mu-\alpha_p-\beta_t-\delta\big(\mathbb{I}\{t\geq 0\}\times\mathbb{I}\{p=QUEBEC\}\big)\Big)^2\hat{\omega}_p\hat{\lambda}_t\Big\}. \quad (1)$$

In equation (1), 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, with Saskatchewan having the lowest weight of 0.11 and the highest weights are 0.14 for each of Nova Scotia, New Brunswick, and Newfoundland & Labrador.

The theoretical literature is currently considering how best to approach multiple outcomes (Tian et al., 2025; Sun et al., 2025). One approach is to construct outcome-specific synthetic controls. This makes it conceptually challenging, however, 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 twelve 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, if the estimates for the effects on statement balances are insignificant from zero before the policy, this indicates that our synthetic

Quebec is a good control for Quebec. Second, if the estimates are also zero before the policy *for other outcomes* that we did not use for weighting, this also supports synthetic Quebec as a control. Third, if the effects of Bill 134 emerge exactly at the time of the policy, despite us not using any minimum payments information in our weighting, then synthetic Quebec is a good control for Quebec. In Section 3, we show that our methodology passes all three of these tests.

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 differences in the weighted means of outcomes between Quebec (Q) and our synthetic Quebec control (SQ) at each time period t relative to the baseline:

$$\delta_\tau = \left(\bar{y}_t^Q - \bar{y}_t^{SQ}\right) - \left(\bar{y}_{baseline}^Q - \bar{y}_{baseline}^{SQ}\right). \tag{2}$$

The term $\bar{y}_t^Q$ is the average outcome for Quebec ($p = 1$) at time t, and similarly, $\bar{y}_t^{SQ} = \sum_{p=2}^{9} \hat{\omega}_p \hat{\lambda}_t y_{p,t}$, shows the average outcome across each of the eight non-Quebec provinces ($p \neq 1$), after applying the SDID weights to create our synthetic Quebec control. Our pre-period is calculated using six months of data that occur 18 to 13 months before August 2019. Our pre-period baseline is calculated as $\bar{y}_{baseline}^Q = \sum_{k=-18}^{-13} \hat{\lambda}_k y_{1,k}$ and $\bar{y}_{baseline}^{SQ} = \sum_{k=-18}^{-13} \sum_{p=2}^{9} \hat{\omega}_p \hat{\lambda}_k y_{p,k}$ for Quebec and our synthetic Quebec control, respectively, where k is event time. To increase the precision of our estimates, we also show versions of this SDID in which we split by each phase of the policy (rather than by every event time), as well as a version in which we estimate a single effect pooled across all policy phases.

For estimation, we want to allow for potential anticipation effects, and therefore define event time period zero as twelve months before August 2019 (Abadie, 2021). When we present our results, however, we normalize event time zero to August 2019 to more clearly refer to the timing of Bill 134.

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—Quebec in our case—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. (2025) 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).

The SDID approach involves substantial aggregation of our consumer-card-level data. We therefore also estimate the effects of the policy using micro data in a DID approach. We continue to leverage, however, the estimated weights from our SDID and estimate standard errors using placebo variance estimation at the provincial-level. This is extremely conservative. We estimate

the following:

$$Y_{c,t} = \sum_{\tau=-12}^{63} \delta_\tau \Big(\mathbb{I}\{t = \tau\} \times \mathbb{I}\{p(c) = QUEBEC\} \Big) + \gamma_c + \gamma_t + \varepsilon_{c,t}. \tag{3}$$

In Equation 3, there is one observation per consumer c per calendar year-month t. 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. As we go on to show, our results are consistent across estimators. To increase statistical power, we also estimate a phased version of our DID equation:

$$Y_{c,t} = \sum_{\tau=I}^{VI} \delta_k^{PHASE} \Big(\mathbb{I}\{PHASE(t) = k\} \times \mathbb{I}\{p(c) = QUEBEC\} \Big) + \gamma_c + \gamma_t + \varepsilon_{c,t}. \tag{4}$$

Instead of estimating the effects of the policy each month, we now have only one indicator, δ_k^{PHASE}, for each phase of the policy $k \in \{I, II, III, IV, V, VI\}$ as explained in Figure 2 and Table 1. We also show the effect of the policy pooled across all phases by estimating Equation 5, using an indicator $POST_t$ for any phases of the policy:

$$Y_{c,t} = \delta^{POST} \Big(POST_t \times \mathbb{I}\{p(c) = QUEBEC\} \Big) + \gamma_c + \gamma_t + \varepsilon_{c,t}. \tag{5}$$

We examine heterogeneity in our estimates by segmenting consumers by their pre-policy behaviors. Such heterogeneity can be important to evaluate the welfare effects of policies with a mix of behavioral and non-behavioral agents (e.g. Campbell, 2016; List et al., 2023; Allcott et al., 2025). Our source of heterogeneity is:

- **Credit Score:** We use the standard TransUnion Canada credit score thresholds for segmenting consumers into five groups based on their pre-policy credit score. In increasing order of creditworthiness, these are: subprime, near prime, prime, prime plus, and super-prime.

Finally, we also apply the SDID methodology to quantify the effect of Bill 134 on credit card offers using our Mintel data at the provincial-level. For this, we use the same SDID weights calculated from the credit reporting data.

3 Effects On Consumers

3.1 Minimum Payment

The "first stage" is how the 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 Policies

Table 1 summarizes how credit card issuers changed their minimum payment rules in August 2019 for Quebec credit cards but did not change them in the rest of Canada. Before Bill 134, seven out of the eleven issuers had minimum payment rules below 2% of the outstanding balance (i.e., the sum of outstanding capital, interest and fees at the time of their credit card statement), and so were forced to tighten their minimum payment rules for their existing Quebec cards. Two issuers tightened their minimum payment rule to 2.0% of the outstanding balance, and three issuers tightened to 2.5%. Pre-policy, these five issuers all had a minimum requirement of $10 plus interest and fees. Two issuers increased their minimum payment to 3.0% of the outstanding balance—one from $10 plus interest and fees, and the other from 1% of the outstanding balance. The remaining four issuers already had minimum payment rules at 2% or higher and so were not mandated to tighten their minimum payment rules in phase I. Indeed, these issuers left their rules unchanged at 2.0% (two issuers), 2.5%, and 3.0% of the outstanding balance.

We do not have a great explanation for the different issuer responses, especially the increases above the minimum requirement. In interviews with bank lending officers, the typical response was that the fixed costs associated with changing minimum requirements every August were substantial. 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 had minimum payment rules below 5% of the outstanding balance, and all issuers tightened minimum payment rules on their new cards opened in Quebec from August 2019 to 5%. In Section 4, we focus on these new cards.

3.1.2 Descriptive Evidence

We use our consumer credit reporting data to describe changes to minimum payment requirements. The first thing to note is that Bill 134 immediately led to an increase in minimum payments. Panel A of Figure 1 shows the mean credit card minimum payment, aggregated across consumer's portfolio of cards. In orange are the means for Quebec consumers, and in blue are the other Canadian provinces. The figure clearly shows an increase in credit card minimum payments in August 2019.

The effect of Bill 134 in Quebec is immediate. The fraction of Quebec credit cards with a minimum payment requirement of less than or equal to $10 declines from 47% to 23%. Furthermore, by August 2019 only 10% of credit cards in Quebec has a minimum payment of less than 2% compared to 45% in July 2019.[14] Cards increasingly have minimum payments bunched around 2%, 2.5%, and 3% of outstanding balances.[15] See Appendix Figure B1 for an illustration for how the distribution of card-level credit card minimum payments changed from July to August 2019 in Quebec, while remaining unchanged in Ontario.

The second thing to note from Panel A of Figure 1 is the divergence between Quebec and other provinces in mean minimum payments over time, with minimum payments increasing in Quebec as Bill 134 tightens minimum payment requirements each year by an additional 0.5 percentage points.

This descriptive evidence validates our empirical design. The Quebec policy clearly increases minimum payments in Quebec without affecting other provinces.

3.1.3 Causal effect 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. We first measure the average effect and then compare the effect across credit scores. Figure 1 Panel B shows the dynamics of how the estimated effects on minimum payments change over time—δ_τ estimates from Equation (2). 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).

Figure 1 Panel B is reassuring for our SDID methodology. It shows no pre-trends before Bill 134 comes into effect, and shows Bill 134 having an effect on minimum payments at exactly the time that we would expect it to, August 2019. This is the case despite only using information on statement balances from 18 to 13 months before the policy began, and not using any information on minimum payments or other card behaviors.

We estimate an immediate and persistent increase in minimum payments in Quebec as a result of Bill 134. Table 3 presents SDID estimates at a variety of time horizons to evaluate the policy's dynamic effects. This table also includes the baseline means, which are calculated 18 to 13 months before the policy began. Column (1) presents results for the effects on minimum payments. At time zero, the month when the policy is introduced, the average increase in minimum payments is $15.50 (s.e. $1.62), and the effect one month later is $17.63 (s.e. $1.50). This declines slightly six months later to $14.93 (s.e. $1.62). These are statistically significant

[14] There are several reasons why this does not fall to zero: (i) regulatory forbearance (about 5% of cards have zero minimum payment requirements on the outstanding balance), and (ii) missing minimum payment requirements in some months for some cards.

[15] Percentages do not bunch perfectly due to accrued interest and fees. The fraction of Quebec cards with minimum payments below 2.05% of the outstanding balance declines from 47% in July 2019 to 17% in August 2019. The fraction below 2.55% declines from 59% to 46%., the fraction below 3.05% increases from 70% to 74%, the fraction below 3.55% increases from 76% to 78%, and the fraction below 4.05% is effectively unchanged at 79%.

increases of 13.2%, 15.1%, and 12.8% relative to Quebec's baseline mean minimum payment of $116.79. If we sum the minimum payments over the first seven statement cycles, this results in a $125.15 average increase in cumulative minimum payments.

Consistent with the descriptive evidence, Table 3 also shows that the long-term effects of the policy are significant and that the marginal effect grows (with the exception of 2020, when there were temporary COVID-19 disruptions) as additional phases of Bill 134 take effect each August. We observe kinks up in minimum payments when each new policy phase is introduced. The average effect sizes are $22.5 (s.e. $3.4) after 24 months, $31.9 (s.e. $3.7) after 36 months, $43.9 (s.e. $4.6) after 48 months, and $60.4 (s.e. $5.2) after 60 months. At 60 months, this represents a 51.7% increase over the baseline. These results are robust to our dynamic DID regression, presented in Figure 5 Panel A and Table 4 column (1).

To test for heterogeneous effects of Bill 134, we divide consumers into credit score bins depending on their credit score pre-policy. Low credit scores is often the result of missed or late payments and high utilization. We therefore expect to see consumers with the lowest credit scores to be the most affected by Bill 134. Appendix Figure 6 Panel A reports the heterogeneous estimates for each phase of the policy, and Appendix Table B1 Panel A reports our estimates of the causal effect of Bill 134 on consumers 60 months after the initial implementation of Bill 134. All consumers experience large increases in minimum payments, and this increases over time. The largest increases, however, occur for the lowest credit score consumers ("subprime"), and the smallest increases for those with the highest credit scores ("superprime").

3.2 Revolving Debt

3.2.1 Casual effect of Bill 134 on revolving debt

In this section we estimate the effects on consumer's revolving debt; Section 3.2.2 uses statement balances. The estimates, presented in Figure 3 Panel A, show that Bill 134 led to a reduction in revolving debt over time. September 2019 ($t = 1$) is the first month when payments are due against the August 2019 statements. In Table 3 column (2), we report that Bill 134 led to a significant decrease of $89.7 (s.e. $39.2) in revolving debt after one month. By the sixth month of implementation, Bill 134 led to a significant decline of $185.5 (s.e. $53.9) in revolving debt. This represents a 7.7% decline relative to Quebec's baseline mean revolving debt of $2,410. In Appendix Figure B2 Panel A, the unconditional means by province show a similar pattern to our SDID estimates.

The effects of Bill 134 persist over time and significantly reduce revolving debt. Figure 3 Panel A and Table 3 column (2) show that the effect grows over time as the later stages of the increasingly stringent policy further increases minimum payments. Bill 134 results in an average decline in revolving debt of $208.4 (s.e. $40.8) after 12 months and $156.6 (s.e. $70.8) after 24 months. Longer-run effects are also statistically significant from zero, showing that Bill 134 results in an average decline in revolving debt of $205.1 (s.e. $88.3) after 36 months, $301.6 (s.e. $121.3) after 48 months, and $380.3 (s.e. $146.9) after 60 months. After 60 months, this

statistically significant effect represents an economically large long-run effect of the policy: an average decline of revolving debt of 15.8% on the baseline mean. These results are robust to our dynamic DID regression, presented in Figure 5 Panel B and Table 4 column (2).

Our results show that Bill 134 was highly effective at reducing credit card debt in the long-run. This result is in sharp contrast to the ineffectiveness of disclosures and nudges to reduce long-run debt (e.g., Agarwal et al., 2015b; Seira et al., 2017; Adams et al., 2022; Batista et al., 2025; Guttman-Kenney et al., 2025; Guttman-Kenney, 2026; Han and Yin, 2025).

Also clear from Figure 3 Panel A is an anticipation effect. In the six months prior to the policy, we see revolving debt falling by approximately $60. This appears consistent with a communications effect leading (some) consumers to increase their monthly payments. Although we do not observe when issuers communicated changes with consumers, we know that they did communicate, via physical mail and email. As a reminder, our SDID estimation baseline is thirteen to eighteen months before the policy, an econometric approach that allows for such anticipation effects without biasing our estimates.

On the extensive margin, Figure 4 Panel A shows that in the first six months Bill 134 led to a significant decrease in the fraction of consumers with revolving debt. This does not, however, persist in the long run. Most of the effect of Bill 134, therefore, is derived from reducing the intensive margin of the amount of debt being revolved, rather than through the pushing consumers entirely out of credit card revolving debt.

When interpreting our results, especially regarding revolving debt, it is important to consider how substantial heterogeneity in credit card payment behaviors places a bound on how large any average treatment effect to reduce revolving debt can feasibly be. We would not expect a one-to-one pass-through from mean minimum payments to mean revolving debt. This is because consumers who already repay their statement balance in full have a revolving debt of zero, which means that estimates for this group have a lower bound of zero, irrespective of the minimum payment, their revolving debt can only remain at zero or increase. This indicates that our estimated average reduction in revolving debt is primarily expected to be driven by the accounts that had revolving debt prior to the policy.

The effects of Bill 134 vary in size by pre-policy credit score, but all credit score groups experience significant reductions in revolving debt in the long-run. Figure 6 Panel A presents our SDID estimates for each credit score group over the phases of the policy, with other panels showing additional outcomes studied later in the paper. After 60 months, the largest reduction in revolving debt is for the subprime group, $627 (s.e. $364), and the smallest is for the superprime group at $28 (s.e. $78). See Appendix Table B1 Panel B for the estimates after 60 months for each credit score group.

How do our revolving debt results compare to existing literature? Unlike our findings, Castellanos et al. (2025) find mixed effects when studying a Mexican bank's minimum payment increase from 5% to 10%. Initially, debt increased due to delinquency-related fees, but within nine months debt appeared to decline—though this decline is imprecisely estimated. These

different results likely reflect different contexts. First, Mexico's 10% minimum payment far exceeds typical rates in markets such as Canada, the U.S., or U.K. Second, Mexico's credit card market is fundamentally different: fewer than 10% of households use credit cards, and those who do have much higher delinquency rates than in Canada. Studies from developed markets offer indirect support for our findings. In particular, Keys and Wang (2019) show that a large fraction of borrowers respond to minimum payment increases by increasing payments at the new levels. d'Astous and Shore (2017) also finds consumers increase payments when the bank in their sample raises requirements—although not always by enough to meet to full requirement.

3.2.2 Casual effect of Bill 134 on statement balances

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 (it includes new spending), the benefit is that it is observable even for the one issuer that does not furnish actual payments information. We report results in Figure 4 Panel B and Table 3 column (3). The short-run effect is an average decline of $137 (s.e. $42) after six months, a 4.3% decrease relative to the control mean of $3,175. The long-run effect is an average decline of $452 (s.e. $165) after 60 months, a 14.2% decrease. These short- and long-run estimates for the effects of Bill 134 on statement balances are consistent in size and direction with our revolving debt estimates. These results on statement balances are also robust to our DID approach (Figure 5 Panel D and Table 4 column (3)).

Heterogeneity in the effects on statement balances by credit scores (Figure B3 Panel A and Appendix Table B2 Panel A) is also consistent with the effects on revolving debt, except that superprime consumers' statement balances are not significantly changed in the long-run.

3.2.3 Casual effect of Bill 134 on spending and payments

By definition, the persistent decrease in revolving debt that we observe must be driven by consumers increasing their credit card payments by more than their new spending and financing charges, as otherwise, revolving debt would increase. This net decrease could arise through different combinations of changes to payments and debt. We therefore decompose these by separately examining the effects on spending and payments. One caveat is that our measure of spending includes financing charges; similarly, payments is not purely for capital repayment but also to repay such financing charges.

Figure 4 Panels C and D suggest that consumers may initially be increasing both their spending and actual payments, with estimates initially being persistently positive but insignificant from zero just before month 36.[16] Figure 4 Panel E shows a similar pattern for "Excess

[16]Spending is defined as in Guttman-Kenney and Shahidinejad (2025) as: $b_t - b_{t-1} + p_t$ if this is greater than or equal to zero, and otherwise takes a value of 0. In this equation, b_t is the credit card statement balance at time t and p_t is the actual payments made against that balance (payments corresponding to this month's balance are due a month later, hence the lag).

Payments," the amount of payments in excess of the minimum.[17] See Appendix Table B2 Panels B, C, and D for the estimates for these three outcomes after 60 months. In addition, Figure B3 Panels C, D, and E show results using the phased SDID specification to increase power. This shows similar results with no notable heterogeneity by pre-policy credit score.

3.3 Causal effect of Bill 134 on delinquency, default, and credit scores

The most natural trade-off of higher minimum payments is the cost of forcing temporarily liquidity constrained cardholders into delinquency and default. Figure 3 Panel B presents our SDID estimates for how Bill 134 affects the likelihood of a consumer transitioning into delinquency, as measured by a consumer having any credit card that is 30+ days past due when it was current in the prior month.

Figure 3 Panel B and Table 3 column (4) show that Bill 134 led to a significant increase in the likelihood of consumers transitioning into delinquency in the first month of phase I—0.084 (s.e. 0.009) basis points. This increases to 0.227 (s.e. 0.0347) basis points one month later. These effects are 9.9% and 26.8% increases on the Quebec baseline mean of 0.845 basis points, respectively.[18] Significant increases in delinquency are more likely from month 36, coinciding with when the policy tightening minimum payments to 4.0%. In the long-run, after 60 months, the effect is 0.129 (s.e. 0.066) basis points, a significant increase of 15.3%. Our SDID short-run effects are corroborated by our DiD estimation; however, our DID long-run results are insignificant—see Table 5 column (1).

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 3 column (5) and Figure 4 Panel I present results. By this measure, Bill 134 did not lead to any significant increase in default. However, the baseline mean is 2.03%, and the confidence intervals are wide, meaning that we cannot rule out economically small increases or decreases. Alternative measures also show no significant effects, although the estimates lack precision. Figure 4 Panel G shows any delinquency, measured by 30+ days past due and Panel H shows any default, measured by 90+ days past due.[19] The DID estimates also show no evidence of significant increases in any of these measures of delinquency or default—see Table 5 columns (2), (3), and (4).

Our results suggest that Quebec's minimum payment policy led to an increase in credit card delinquency but not default. This suggests that increases in financial distress are temporary, with consumers being able to adjust their spending and payment behaviors without spiraling

[17] Excess payments is defined by $p_t - m_{t-1}$, if this is greater than or equal to zero, and otherwise takes a value of 0. In this equation, p_t is the credit card actual payments at time t and m_{t-1} is the minimum payment amount due (payments are due for this month's minimum payment a month later, hence the lag).

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

[19] In unreported preliminary results, there are no signs of delinquencies elsewhere on their portfolios, with auto loans and mortgage defaults and bankruptcy all trending down. However, these are all insignificant from zero and we cannot rule out small increases or decreases.

into greater financial distress or leading to costly charge-offs for lenders. Given that we do not find significant effects on defaults when using data covering the population of Canada, arguably any effect size that we cannot rule out may affect too small a number of consumers to be economically important.

Our results are highly suggestive that Bill 134 did not impose an undue burden on Quebec credit card holders. How do our results compare to prior estimates? Castellanos et al. (2025) found that (large) increases to minimum payments in Mexico had no significant increase in short-run default—defined as failing to meet the minimum payment in three consecutive monthly payments—but that default rates increased over nine to fourteen months and remained persistent through the end of their sample. Keys and Wang (2019) estimate increases in delinquency, measured by not paying at least the minimum, of 0.4 percentage points after one month and d'Astous and Shore (2017) find increases in delinquency, measured by 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. Credit scores are often interpreted as a summary statistic for a consumer's financial well-being (Gibbs et al., 2025). Panel A suggests slightly improved scores, on average, while Panel B reveals that in the latter phases of the policy, subprime consumers' average credit scores significantly improve by approximately 20 points. This represents a non-trivial improvement that is a similar magnitude to the improvement in scores from the removal of bankruptcy flags (e.g., Dobbie et al., 2020).

3.4 Causal effect of Bill 134 on credit limits

Figure 4 Panel F shows the effects of Bill 134 on credit card limits, with estimates in Table 3 column (6). The policy led to a significant decline in consumer's average credit card limits of \$273 (s.e. \$121) after six months. This represents a 2.1% decline relative to the baseline mean of \$12,777. These declines generally become larger over time as the Quebec policy becomes more restrictive. The long-run effect of the policy is to reduce average credit limits by \$1,080 (s.e. \$300), an 8.5% decline relative to the baseline mean. Figure 5 Panel H, along with estimates in Table 4 Column (4), show that the DID estimates are smaller but consistent with significant declines in credit limits the long-run.

Figure 6 Panel D aims to disentangle the average effect of Bill 134 on consumer credit limits by credit score bins over time. Appendix Table B2 Panel E displays the long-run estimates. Across all phases of the policy, there are no significant changes to credit limits for superprime consumers. In contrast, credit limits for other groups fall, though the subprime estimates are less precise.

Overall, it appears that issuers are reducing credit access. This is consistent with the hypothesis that some consumers become unprofitable once minimum payment requirements increase beyond what issuers would voluntarily set. We explore the implications of the policy on credit

access by studying new card openings in the next section.

Our heterogeneity results on credit limits can help us learn about potential cross-subsidization in the credit card market (Agarwal et al., 2025a). The minimum payment policy is an exogenous shock to the profitability of revolvers. In theory, if there is no cross-subsidization, then higher minimum payments would only be expected to reduce credit access of revolvers.[20] This is because transactors are already paying in full so their choices and profitability should not be expected to be impacted by changes to this contract term. If revolvers subsidize transactors, however, then transactors' credit access may also be reduced. The fact that superprime consumers, where transactors are concentrated (e.g., Guttman-Kenney and Shahidinejad, 2025), are the only group whose credit access is unaffected appears inconsistent with transactors cross-subsidizing revolvers.

4 Credit Supply

This section presents our results for the account-level effects of the Quebec minimum payment policy on accounts opened between August 2019 and 2020. For these new cards, all eleven issuers tightened their minimum payment policies in Quebec to 5%—the lowest allowable minimum payment level. These issuers left their policies unchanged in the rest of Canada. We study how new card issuance and lender supply of credit offers change by comparing outcomes in Quebec to those in the neighboring province of Ontario.

4.1 Minimum payments on new cards

Cohorts of cards opened in Quebec from August 2019 onward had substantially higher minimum payments than cohorts of cards opened in Quebec before August 2019, as well as those opened before or after in Ontario. Figure 8 displays the unconditional mean of minimum payments for each cohort of newly opened credit cards in months since origination. Quebec card cohorts are in black, and Ontario card cohorts in orange. Lines are solid with circled points if card cohorts opened after August 2019, and dashed lines without circled points are card cohorts opened before August 2019.

4.2 New card openings

Figure 9 Panel A shows the number of new credit card openings per month, while Panel C shows the total credit limit. Since Ontario is larger than Quebec, Panel B normalizes the number of openings to August 2018 and Panel D does the same for limits. Prior to August 2019, relatively more new credit cards were opened in Quebec than in Ontario. After the policy, relatively fewer new credit cards opened in Quebec than Ontario.

[20] One nuance to this is that if firms lend to transactors on the basis that they may migrate to become revolvers (a migration modeled by sophisticated credit card lenders), then they may also restrict access to transactors.

A combination of three reasons may explain our findings. First, issuers likely anticipated that the 5% minimum payment policy on new cards would impact their profitability, and change the customer's "top of wallet card". Offering consumers new credit cards can help to shift spending towards those new card, consistent with mental accounting (Gelman and Roussanov, 2024). As a result, issuers might have expanded their marketing efforts to bring forward the timing of when customers opened new cards. This appears likely given the timing of our results. There is a short-term decrease in new card openings (in July, August, and September 2019) following earlier short-term increases—most notably in October and November of 2018 and in April and May of 2019. Second, the marginally profitable consumer with a 2-3% minimum payment requirement might no longer be profitable at a 5% minimum payment. As a result, issuers might have tightened approval criteria and rationed credit. Finally, the result is consistent with reduced demand by consumers for credit cards with higher minimum payments. In the next subsection, we use credit offers to evaluate the supply-side explanations. We plan to quantify the size and characteristics of a missing mass of new credit cards to better understand this result and potential explanations.

Irrespective of the reason, the 5% requirement on new cards is associated with a reduction in credit access. The total value of credit limits (measured three months after opening) for each card cohort are shown in Figure 9 Panels C (levels) and D (indexed). For cohorts of cards opened before August 2019, the patterns in Quebec and Ontario are similar. For cohorts of cards opened from August 2019 onward, there is a relative decline in the total value of credit card limits opened in Quebec relative to Ontario. The mean value of credit limits is shown in Figure 9 Panels E (levels) and F (indexed). These two series closely track one another until October 2019. Among the cards opened, the mean credit limits of cards opened in October or November 2019 in Quebec is relatively lower than in Ontario.

4.3 Credit card offers

The previous section points to an increase in credit card openings in Quebec just before the policy came into effect, and a decrease just after. Here, we follow prior literature (e.g., Han et al., 2018) to 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.

The left hand side panels of Figure 10 and Appendix Figure B4 plot the defining features of card offers between 2018 and 2020 for Quebec and Ontario. We compare Quebec to Ontario for illustrative purposes. Our SDID estimation strategy leverages data from all of the provinces. The pattern for number of offers is largely similar in both provinces, with an increase in offers in the spring of 2019 and a decrease in the summer of 2019. In the fall and winter of 2019 there are relatively fewer mailings in Quebec than in Ontario.

The largest difference between the two provinces is in the type of offers just before August 2019. In Ontario, the majority of offers are to attract new consumers, and this is consistent over the sample period. Meanwhile, in Quebec, the offers in the summer of 2019 are for retention.

In our sample, retentions are largely offers to upgrade an existing card for a loyal customer. Just prior to the policy coming in effect, consumers in Quebec are offered lower interest rates, lower annual fees, and higher credit limits. Post-August 2019, we see a return to normal. These patterns are consistent with issuers trying to stay, or become top of wallet for their existing consumers, by ensuring their cards have a minimum payment requirement lower than the 5% required for cards activated post-August 2019. The right hand side panels of Figure 10 and Appendix Figure B4 present the estimates applying our SDID weights and estimation strategy to the card offers data. The results are consistent with the means. As a result, we think that most, if not all, of the increase in card openings observed in consumer credit reporting data just before the first phase of Bill 134 comes from a targeted increase in supply.

5 Conclusions

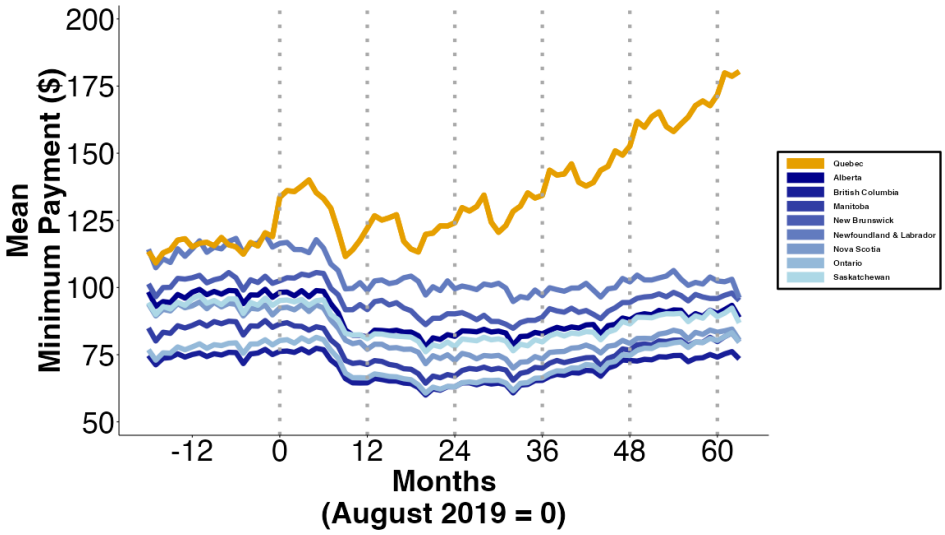
This paper provides an analysis of the impact of a paternalistic government policy that restricts consumers' payment choices by tightening credit card minimum payments in Quebec, but not in the rest of Canada. We estimate the causal effects of the policy by applying a synthetic difference-in-differences approach to comprehensive Canadian consumer credit reporting data. We find that the policy was highly effective at reducing long-term revolving debt.

A potential cost of the policy is a reduction in access to credit to meet temporary liquidity constraints. We document an increase in consumers transitioning into delinquency but not default. We also document a response by credit card issuers—the reduce credit access, especially by reducing the number of new cards being offered.

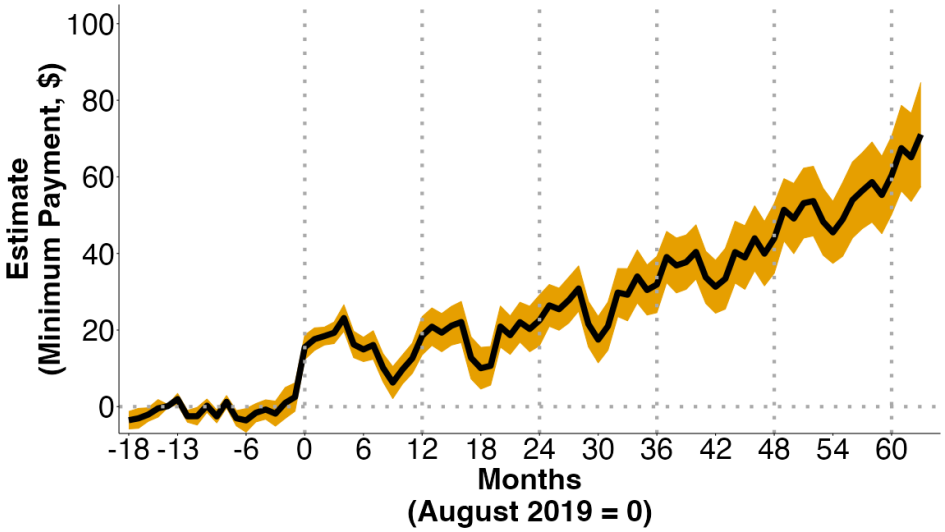
This reduced access to credit cards may be a cost or a benefit in welfare calculations, depending on whether it is the credit access of rational or behavioral agents that is being constrained, and depending on how agents without access respond (e.g., using more expensive forms of credit or becoming delinquent on other household bills is welfare reducing). As Campbell (2016) writes, "Consumer financial regulation must confront the trade-off between the benefits of intervention to behavioral agents, and the costs to rational agents." Our evidence helps to inform the evaluation of such trade-offs. This can inform how to weigh the costs and the benefits to assist governments and regulators about whether to make consumer financial protection policy that constrains credit card issuers' minimum payment policies.

Figure 1: Consumer credit card minimum payments

A. Unconditional means of minimum payments by province

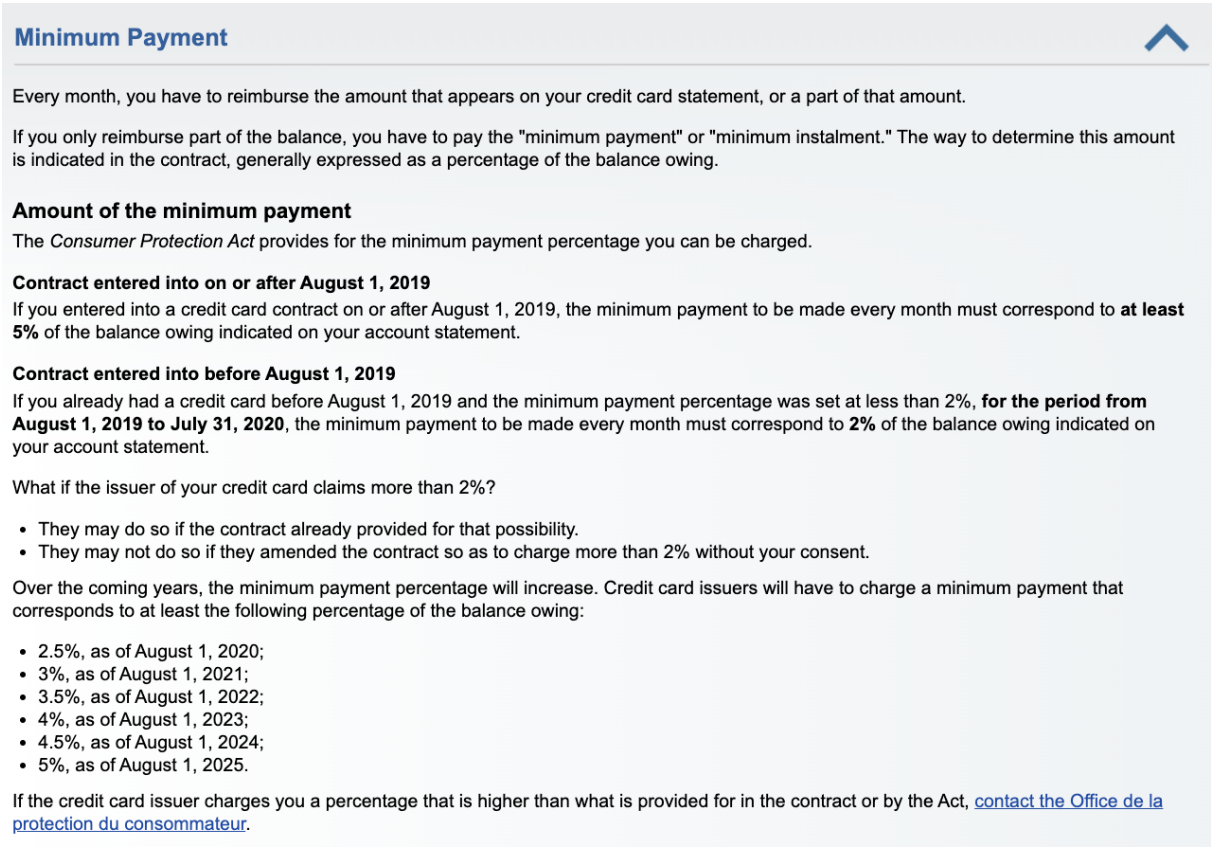


B. Synthetic difference-in-difference estimates for the effects of Quebec policy on minimum payments



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 outstanding balance. The dashed gray vertical lines denote months when phases of the Quebec policy begins, increasing minimum payment requirements by 50 basis points from 2% in August 2019 to 4.5% in August 2024. 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 Quebec policy began, the δ_τ estimates calculated in Equation 2 using our SDID specification in Equation 1. 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. Both panels are calculated using data on the credit cards held by 22.5 million consumers in Canada observed over 82 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.

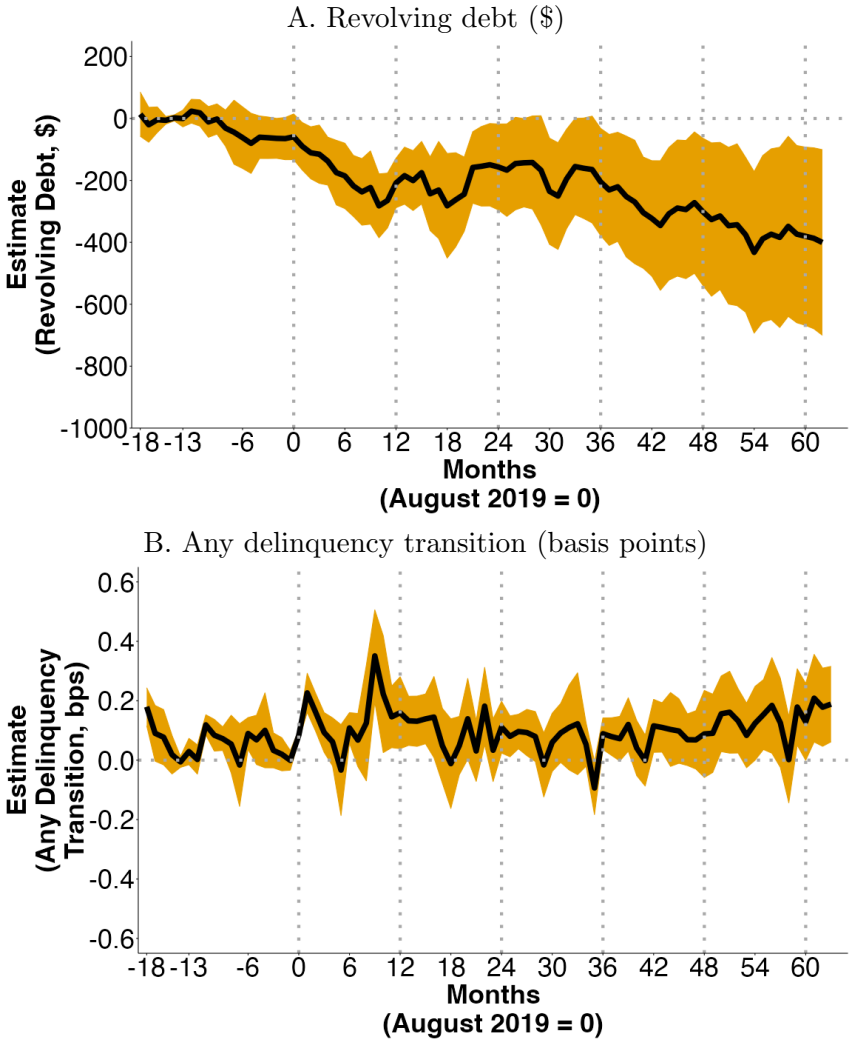
Over the coming years, the minimum payment percentage will increase. Credit card issuers will have to charge a minimum payment that corresponds to at least the following percentage of the balance owing:

- 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.

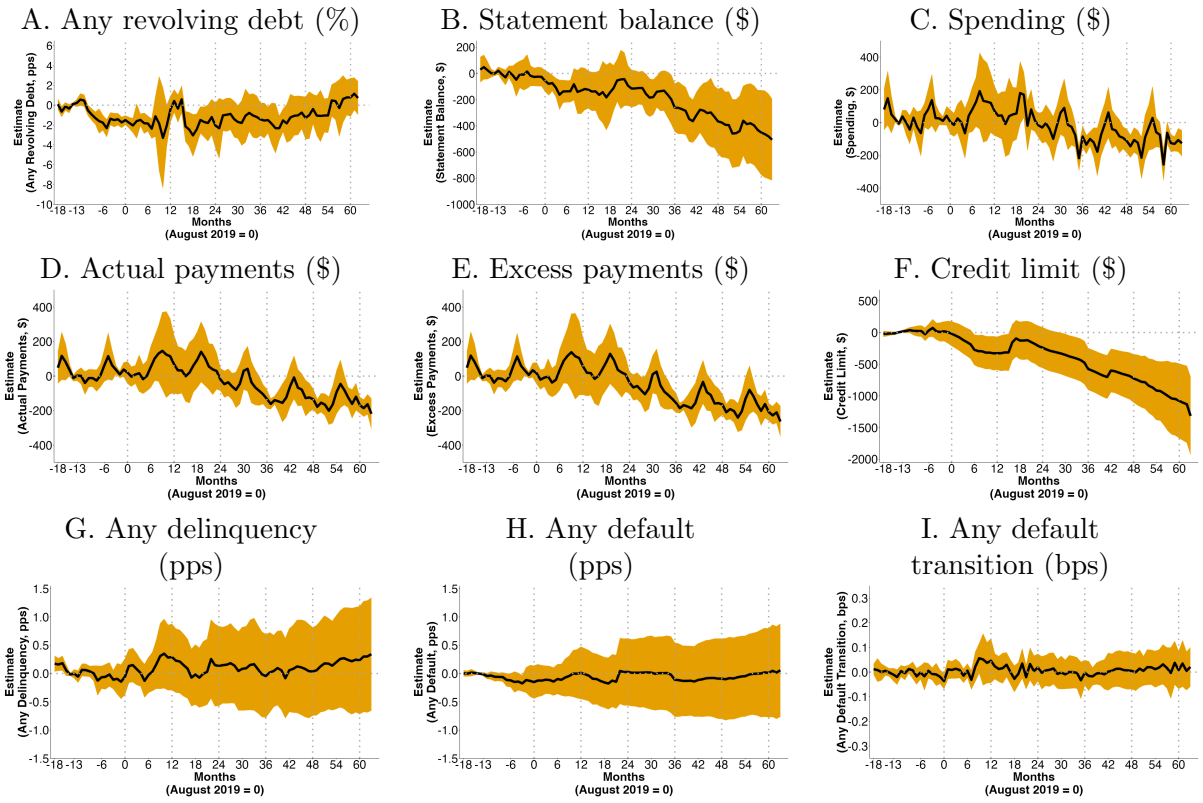
Notes: Data source is Québec Office de la Protection du Consommateur.

Figure 3: Synthetic difference-in-differences estimates for the effects of the policy on (A) revolving credit card debt, and (B) any credit card delinquency



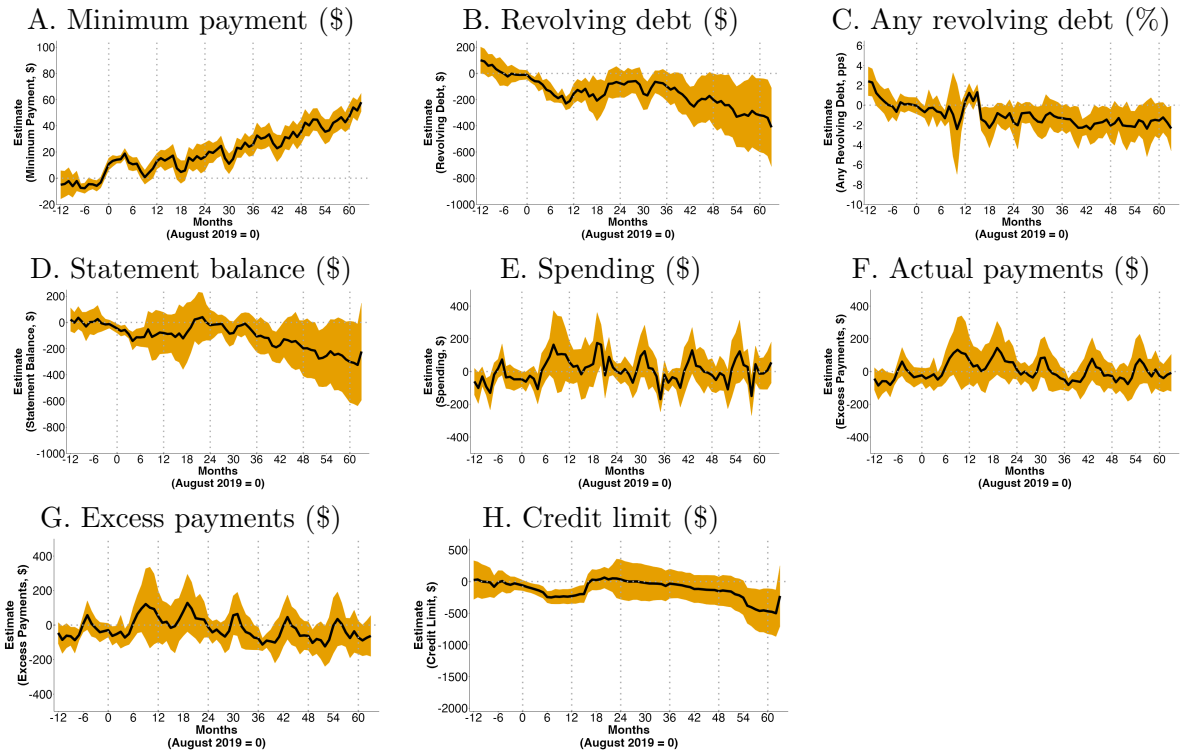
Notes: Data source is TransUnion. Estimates for the effects of the Quebec policy. Each panel in this figure presents the estimated dynamic effects for a different outcome for τ months after the Quebec policy began, the δ_τ estimates calculated from Equation 2 using our SDID specification in Equation 1. The outcome in Panel A is credit card revolving debt, measured in Canadian dollars. The outcome in Panel B is basis points (bps) of "Any Delinquency Transition": 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. The dashed gray vertical lines denote months when phases of the Quebec policy begins, increasing minimum payment requirements by 50 basis points from 2% in August 2019 to 4.5% in August 2024. 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. All panels are calculated using data on the credit cards held by 22.5 million consumers in Canada observed over 82 months.

Figure 4: Synthetic difference-in-differences estimates for the effects of the policy on other credit card outcomes



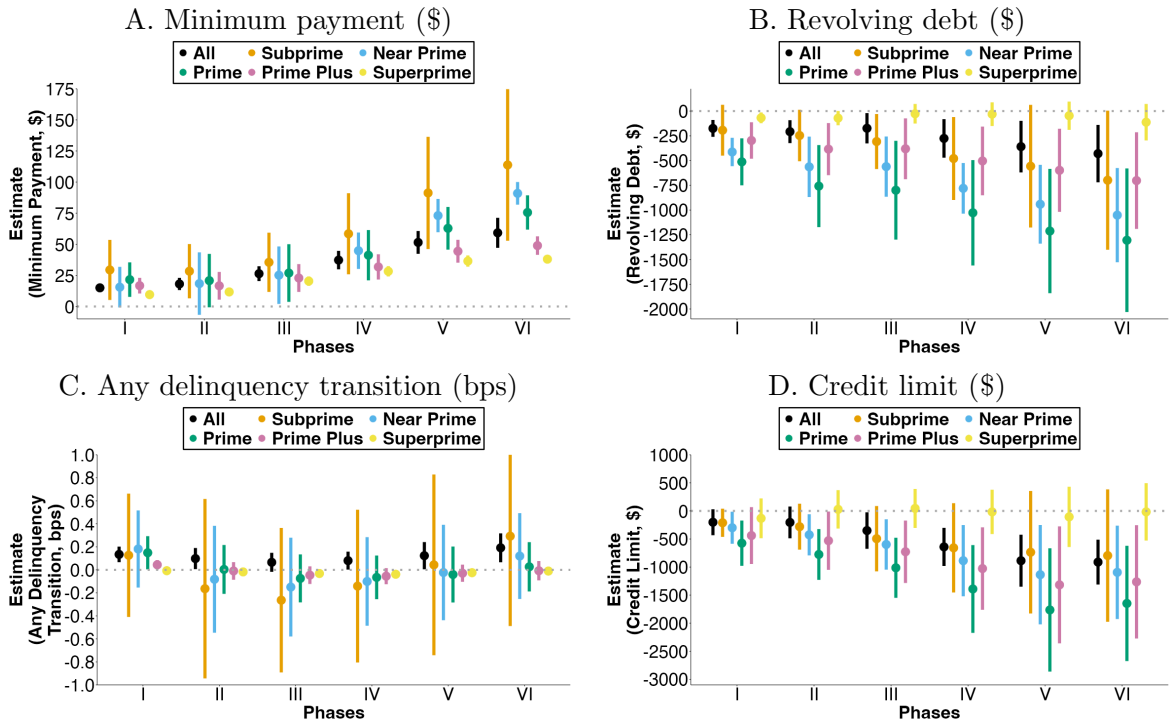
Notes: Data source is TransUnion. Estimates for the effects of the Quebec policy. Each panel of this figure presents the estimated dynamic effects for a different outcome for τ months after the Quebec policy began, the δ_τ estimates calculated from Equation 2 using our SDID specification in Equation 1. The outcome in Panel A 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 B is credit card statement balance. The outcome in Panel C is the total value of new spending on the card. The outcome in Panel D is the total value of actual payments made. The outcome in Panel E is the total value of actual payments made in excess of the minimum payment. The outcome in Panel F is the total value of credit card limits. The outcome in Panel G 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 H if it is 90 or more days past due. The outcome in Panel I is basis points (bps) of a binary variable that takes a value of one if any credit card account transitions from being current in the previous month to being 90 or more days past due in this month. The outcomes in Panels A, G, and H are all measured in percentage points. The outcomes in Panels B, C, D, E, and F are all measured in Canadian dollars. The dashed gray vertical lines denote months when phases of the Quebec policy begins, increasing minimum payment requirements by 50 basis points from 2% in August 2019 to 4.5% in August 2024. 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. All panels are calculated using data on the credit cards held by 22.5 million consumers in Canada observed over 82 months.

Figure 5: Difference-in-differences estimates for the effects of the policy on credit card outcomes



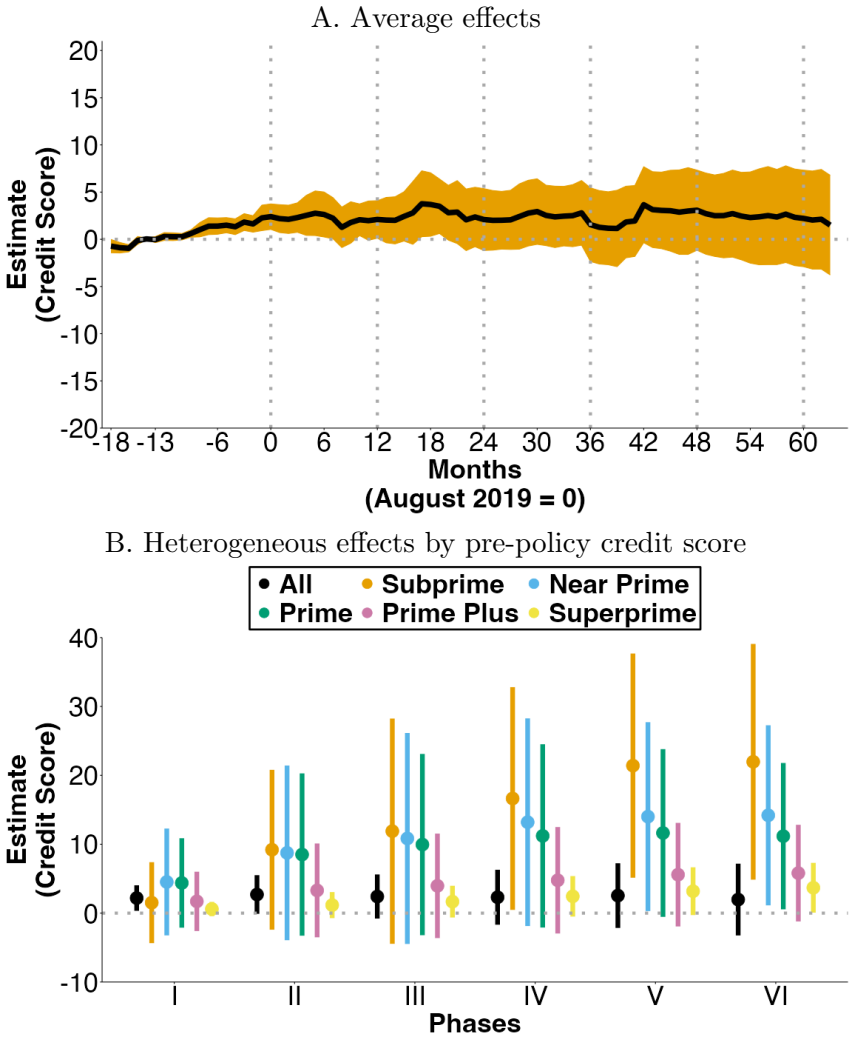
Notes: Data source is TransUnion. Each panel in this figure presents results for a different outcome, estimated by the dynamic effects for τ months after the Quebec policy began, the δ_τ estimates calculated from Equation 2 from our dynamic DID specification in Equation 3, which applies the provincial weights calculated in our synthetic difference-in-differences (SDID). The outcome in Panel A is the value of credit card minimum payments. The outcome in Panel B is credit card revolving debt. 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 D is credit card statement balance. The outcome in Panel E is the total value of new spending on the card. The outcome in Panel F is the total value of actual payments made. The outcome in Panel G is the total value of actual payments made in excess of the minimum payment. The outcome in Panel H is the total value of credit card limits. The outcome in Panel C is measured in percentage points. The outcomes in all other panels are all measured in Canadian dollars. The dashed gray vertical lines denote months when phases of the Quebec policy begins, increasing minimum payment requirements by 50 basis points from 2% in August 2019 to 4.5% in August 2024. Standard errors are calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021), with error bars showing 95% confidence intervals. All panels are calculated using data on the credit cards held by 22.5 million consumers in Canada observed over 76 months.

Figure 6: Synthetic difference-in-differences estimates for the heterogeneous effects by credit score for credit card outcomes during each policy phase



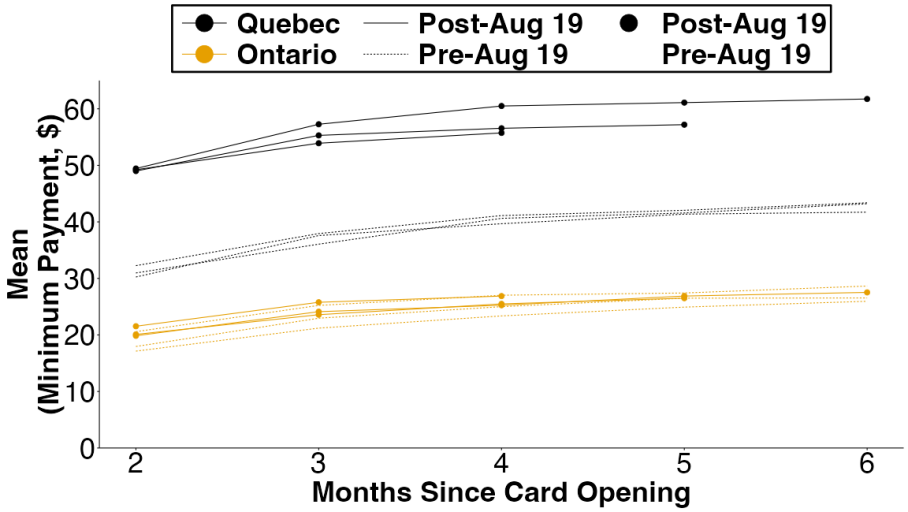
Notes: Data source is TransUnion. Each panel in this figure presents the estimated effects for a different outcome for each phase of the Quebec policy, the δ_k^{PHASE} calculated based on our SDID specification in Equation 1. Different colors denote the effects estimated for different TransUnion credit score groups calculated in the baseline. Colors denote different credit score groups: subprime (<600), near prime (600-699), prime (700-779), prime plus (780-829), and superprime (830+). In black, all is the estimates across all credit score groups combined. Each phase of the Quebec policy increases minimum payment requirements by 50 basis points from 2% in August 2019 to 4.5% in August 2024. The outcome in panel A is the value of credit card minimum payments. The outcome in Panel B is credit card revolving debt. The outcome in Panel C is basis points (bps) of a binary variable that takes a value of one if any credit card account transitions from being current in the previous month to being 90 or more days past due in this month. The outcome in Panel D is the total value of credit card limits. The outcomes in panels A, B, and D are all measured in Canadian dollars. Standard errors are calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021), with error bars showing 95% confidence intervals. All panels are calculated using data on the credit cards held by 22.5 million consumers in Canada observed over 82 months.

Figure 7: Synthetic difference-in-differences estimates for the effects on credit score



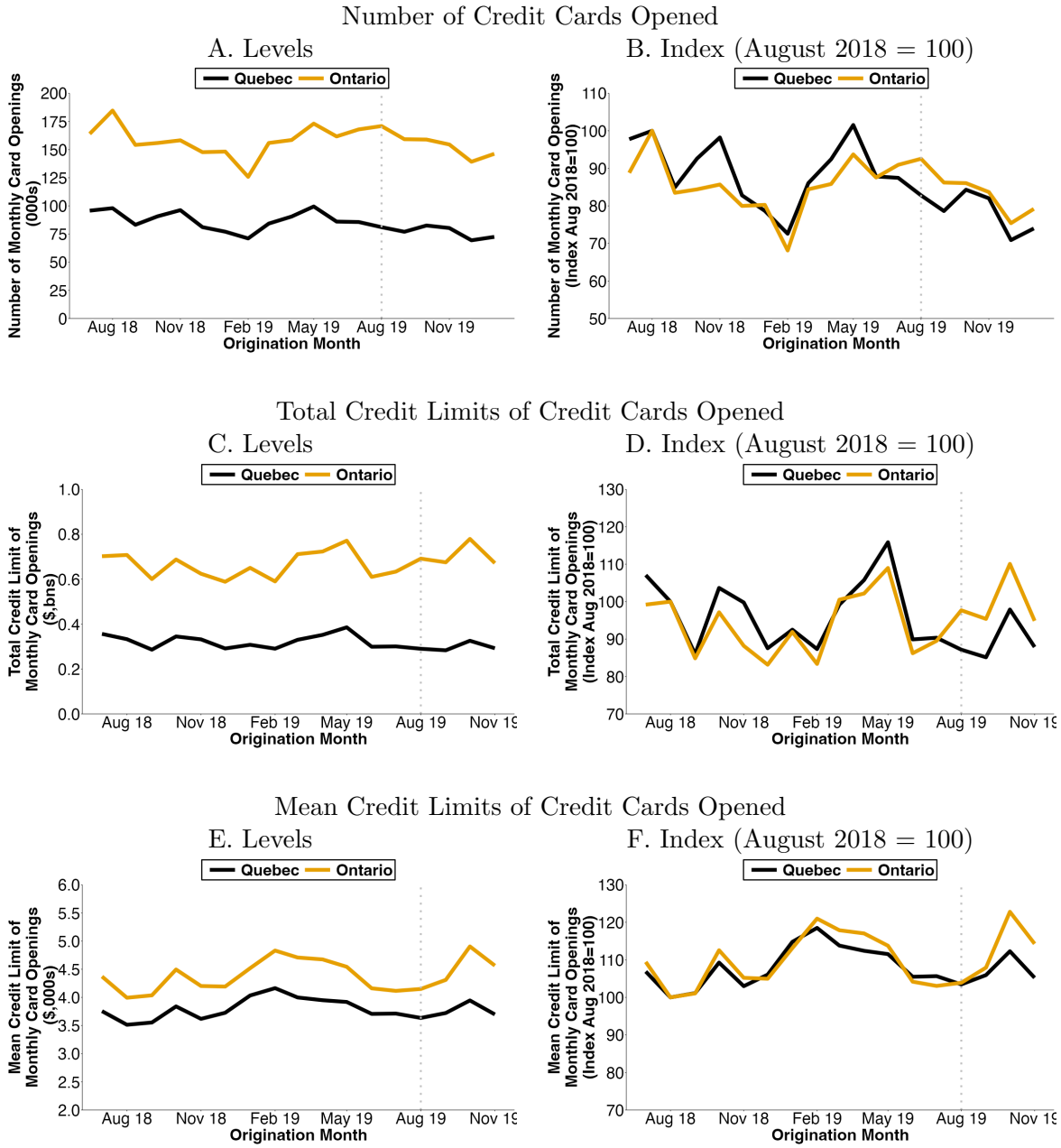
Notes: Data source is TransUnion. Panel A of this figure presents the estimated dynamic effects on credit score for τ months after the Quebec policy began, the δ_τ estimates calculated from Equation 2 using our synthetic difference-in-differences (SDID) specification specified in Equation 1. Panel B of this figure presents the estimated effects on credit score for each phase of the Quebec policy, the δ_k^{PHASE} calculated based on our synthetic difference-in-differences (SDID) specification specified in Equation 1. Different colors denote the effects estimated for different TransUnion credit score groups calculated in the baseline. Colors denote different credit score groups: subprime (<600), near prime (600-699), prime (700-779), prime plus (780-829), and superprime (830+). In black, all is the estimates across all credit score groups combined. Each phase of the Quebec policy increases minimum payment requirements by 50 basis points from 2% in August 2019 to 4.5% in August 2024. In both panels, standard errors are calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021), with error bars showing 95% confidence intervals. All panels are calculated using data on the credit cards held by 22.5 million consumers in Canada observed over 82 months.

Figure 8: New cards—unconditional means of minimum payments



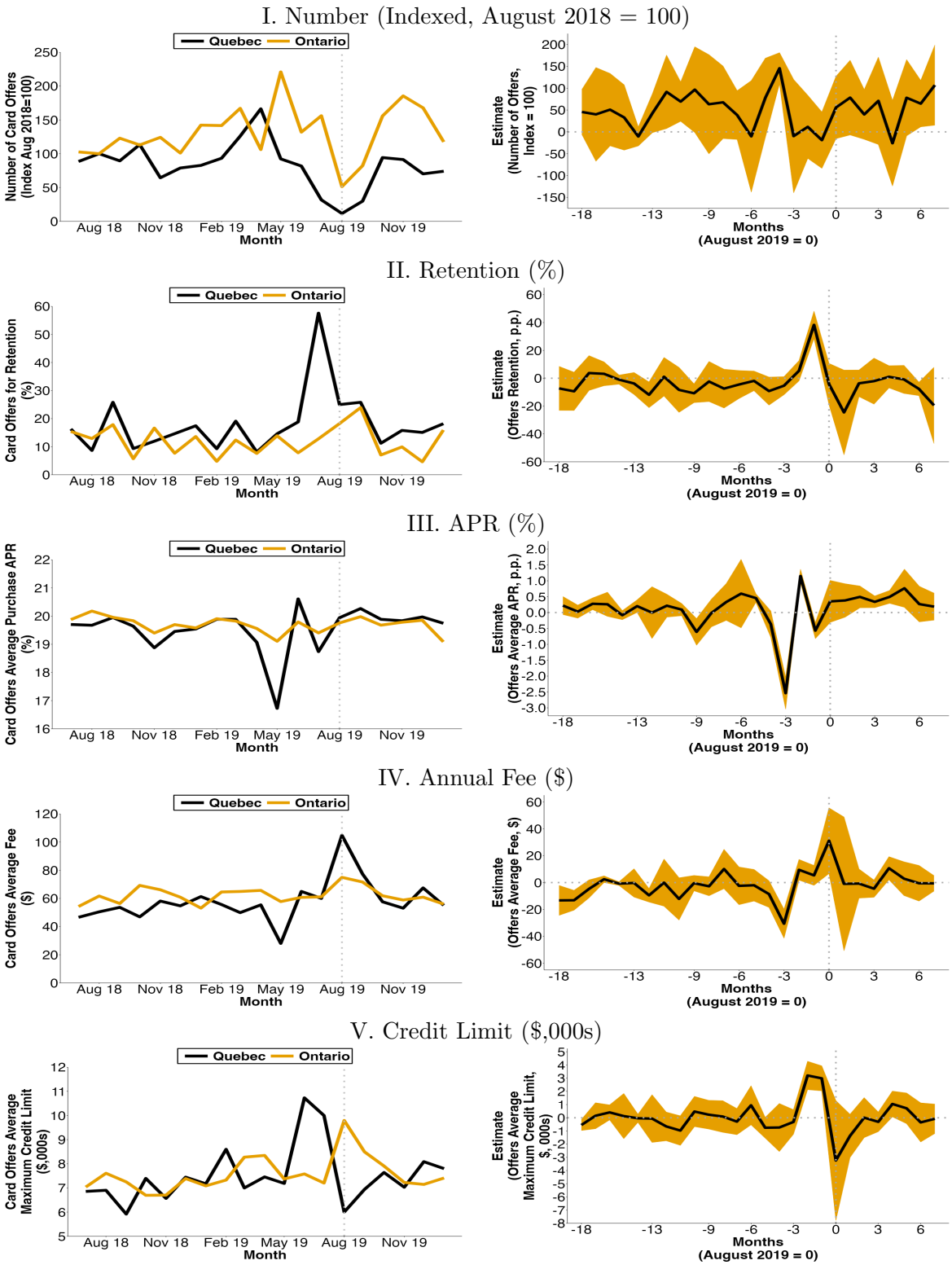
Notes: Data source is TransUnion. This figure shows unconditional means for cohorts of new cards opened in Quebec or Ontario during August, September, and October of 2018 and 2019. The x-axes show months since card opening. Black solid lines with circled points denote card cohorts opened in Quebec in 2019, after the policy. Black dashed lines without circled points denote card cohorts opened in Quebec in 2018, before the policy. Yellow solid with circled points denote card cohorts opened in Ontario in 2019 and yellow dashed lines without circled points denote those opened in 2018. Post-Aug 2019 lines end before the start of the COVID-19 pandemic. This shows, for cards observed in each cohort each month, the unconditional means of minimum payments each month since card opening.

Figure 9: New credit card openings, by month of opening



Notes: Data source is TransUnion. This figure summarizes the number of new credit cards opened separately in Quebec and Ontario, each month from July 2018 to November 2018 (and December 2018 for Panels A and B). Panels C to F use credit limits as recorded three months after origination. Panel A shows the number of originations in $ thousands, B in $ billions, and E in $ thousands. Panels B, D, and E normalize each province's series to 100 for their levels in August 2018.

Figure 10: Monthly mailed credit card offers



Notes: Data source is Mintel Comperemedia. The left hand panels of this figure present means for the number and characteristics of mailed credit card offers in Quebec and Ontario between July 2018 and January 2020. The right hand panels report the SDID estimates of the effect of Bill 134 on offers. Section I normalizes the number of cards by 100 in August 2018. For consumers receiving offers: (i) Section II shows the percentage of offers meant to retain an existing cardholder (e.g., to upgrade or renew an existing card); (ii) Section III shows the average interest rate (APR) on new purchases listed on offers; (iii) Section IV shows the average annual fee listed on offers; (iv) Section V shows the average maximum credit limit listed on offers.

Table 1: Lender minimum payment formulae 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% ob, \$10}	max{2.5% ob, \$10}	max{3.0% ob, \$10}	max{3.5% ob, \$10}	max{4.0% ob, \$10}	max{4.5% ob, \$10}	max{5.0% ob, \$10}
B	\$10 + interest + fees	max{2.0% ob, \$10}	max{2.5% ob, \$10}	max{3.0% ob, \$10}	max{3.5% ob, \$10}	max{4.0% ob, \$10}	max{4.5% ob, \$10}	max{5.0% ob, \$10}
C	\$10 + interest + fees	max{2.5% ob, \$10}	max{2.5% ob, \$10}	max{3.0% ob, \$10}	max{3.5% ob, \$10}	max{4.0% ob, \$10}	max{4.5% ob, \$10}	max{5.0% ob, \$10}
D	\$10 + interest + fees	max{2.5% ob, \$10}	max{2.5% ob, \$10}	max{3.0% ob, \$10}	max{3.5% ob, \$10}	max{4.0% ob, \$10}	max{4.5% ob, \$10}	max{5.0% ob, \$10}
E	\$10 + interest + fees	max{2.5% ob, \$10}	max{3.0% ob, \$10}	max{3.5% ob, \$10}	max{4.0% ob, \$10}	max{4.5% ob, \$10}	max{5.0% ob, \$10}	max{5.0% ob, \$10}
F	\$10 + interest + fees	max{3.0% ob, \$10}	max{3.0% ob, \$10}	max{3.0% ob, \$10}	max{3.5% ob, \$10}	max{4.0% ob, \$10}	max{4.5% ob, \$10}	max{5.0% ob, \$10}
G	max{1.0% ob, \$10}	max{3.0% ob, \$10}	max{3.0% ob, \$10}	max{3.0% ob, \$10}	max{3.5% ob, \$10}	max{4.0% ob, \$10}	max{4.5% ob, \$10}	max{5.0% ob, \$10}
H	max{2.0% ob, \$10}	max{2.0% ob, \$10}	max{2.5% ob, \$10}	max{3.0% ob, \$10}	max{3.5% ob, \$10}	max{4.0% ob, \$10}	max{4.5% ob, \$10}	max{5.0% ob, \$10}
I	max{2.0% ob, \$10}	max{2.0% ob, \$10}	max{2.5% ob, \$10}	max{3.0% ob, \$10}	max{3.5% ob, \$10}	max{4.0% ob, \$10}	max{4.5% ob, \$10}	max{5.0% ob, \$10}
J	max{2.5% ob, \$10}	max{2.5% ob, \$10}	max{2.5% ob, \$10}	max{3.0% ob, \$10}	max{3.5% ob, \$10}	max{4.0% ob, \$10}	max{4.5% ob, \$10}	max{5.0% ob, \$10}
K	max{3.0% ob, \$10}	max{3.0% ob, \$10}	max{3.0% ob, \$10}	max{3.0% ob, \$10}	max{3.5% ob, \$10}	max{4.0% ob, \$10}	max{4.5% ob, \$10}	max{5.0% ob, \$10}

Notes: Table 1 shows the history of credit card minimum formulae used by different credit card issuers for cards opened before August 2019. For new cards, issuers changed the formulae to the required minimum of max{5.0% ob, \$10} in Quebec (only) in August 2019. "ob" denotes outstanding balance. Formulae shown are for existing cards as of the implementation dates. Outstanding balance is the combination of outstanding capital, interest and fees.

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

Province	Province Weight ($\hat{\omega}_p$)
Quebec	1.0000
Alberta	0.1245
British Columbia	0.1191
Manitoba	0.1118
New Brunswick	0.1365
Newfoundland & Labrador	0.1383
Nova Scotia	0.1400
Ontario	0.1229
Saskatchewan	0.1069

Notes: Data source is TransUnion. 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 1. Each time period after our six-month matching periods receives equal time weight ($\hat{\lambda}_t$). This estimation follows the approach in Arkhangelsky et al. (2021) and Clarke et al. (2024).

Table 3: Synthetic difference-in-differences estimates for the dynamic effects of the Quebec policy

Months Since Policy	Minimum Payment ($) (1)	Revolving Debt ($) (2)	Statement Balance ($) (3)	Any Delinquency Transition (b.p.) (4)	Any Default Transition (bps) (5)	Credit Limit ($) (6)
0	15.5	-59.21	-56.91	0.0835	-0.0365	-18.13
	(1.62)	(37.66)	(40.88)	(0.0091)	(0.0164)	(98.2)
1	17.63	-89.74	-79.35	0.2265	0.0108	-46.8
	(1.5)	(39.18)	(44.61)	(0.0337)	(0.0196)	(102.08)
6	14.93	-185.45	-136.79	0.1085	0.0057	-272.83
	(1.62)	(53.86)	(42.19)	(0.0263)	(0.0143)	(121.44)
12	18.5	-208.35	-124.31	0.1595	0.046	-327.14
	(2.54)	(40.78)	(72.65)	(0.0618)	(0.0456)	(132.56)
24	22.54	-156.64	-115.35	0.1111	0.0185	-238.91
	(3.37)	(70.83)	(71.66)	(0.0444)	(0.028)	(163.04)
36	31.88	-205.13	-261.47	0.089	-0.003	-575.96
	(3.74)	(88.32)	(93.4)	(0.0271)	(0.0261)	(167.41)
48	43.93	-301.64	-366.5	0.0882	0.0049	-725
	(4.64)	(121.3)	(126.56)	(0.0747)	(0.0372)	(193.34)
60	60.38	-380.29	-451.55	0.1289	0.008	-1,079.71
	(5.2)	(146.85)	(165)	(0.066)	(0.0388)	(300.02)
Baseline Mean	116.79	2,410.04	3,174.76	0.8448	0.2339	12,777.2

Notes: Data source is TransUnion. Estimates the effects of the Quebec policy. Each row of this table shows the dynamic effects for $\tau \in \{0, 1, 6, 12, 24, 36, 48, 60\}$ *months after the Quebec policy began, the* δ_τ *estimates calculated from Equation 2 from our dynamic SDID specification specified in Equation 1. Each column presents estimates from a separate SDID regression on a different outcome. The units of columns 1, 2, 3, and 6 are in Canadian dollars, and the units of columns 4 and 5 are in basis points (bps). The outcome "Any Delinquency Transition" 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. The outcome "Any Default Transition" 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 90 or more days past due in this month. Standard errors are calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021). This table is calculated using data on the credit cards held by 22.5 million consumers in Canada observed over 82 months. The baseline means are calculated for Quebec during the period eighteen to thirteen months before the policy, using the SDID's time-weights following Clarke et al. (2024).*

Table 4: Difference-in-differences estimates for the effects of the Quebec policy on delinquency and default during each policy phase

Months Since Policy	Minimum Payment ($) (1)	Revolving Debt ($) (2)	Statement Balance ($) (3)	Credit Limit ($) (4)
0	10.85	-10.47	-45.82	-61.04
	(2.28)	(17.38)	(17.66)	(41.92)
1	13.24	-40.98	-65.28	-84.24
	(2.14)	(14.64)	(19.91)	(40.18)
6	10.63	-137.21	-114.09	-244.84
	(2.59)	(34.13)	(35.74)	(45.71)
12	12.96	-155.15	-80.5	-230.36
	(3.02)	(37.69)	(80.28)	(58.92)
24	16.42	-75	-21.11	33.59
	(5.39)	(54.42)	(59.05)	(159.54)
36	25.62	-98.45	-107.05	-32.97
	(4.2)	(56.53)	(60.97)	(117.7)
48	35.63	-200.35	-197.66	-153.4
	(4.67)	(101.35)	(108.01)	(115.4)
60	47.03	-319.01	-301.03	-469.69
	(4.66)	(143.28)	(158.37)	(182.14)
Post	28.1	-199.94	-126.25	-160.67
	(5.36)	(67.42)	(45.29)	(109.37)

Notes: Data source is TransUnion. Estimates the effects of the Quebec policy. Each row of this table shows the dynamic effects for $\tau \in \{0, 1, 6, 12, 24, 36, 48, 60\}$ months after the Quebec policy began, the δ_k estimates calculated from Equation 3 from our dynamic difference-in-differences (DID) specification. The last row in each column shows the pooled difference-in-differences estimates calculated from Equation 5. Both of these DID regressions apply the provincial weights calculated in our synthetic difference-in-differences (SDID). Each column in the table presents estimates from a separate dynamic regression on a different outcome. The final row of each table also presents results from a separate pooled regression, for that same outcome shown for the dynamic regressions. Standard errors are calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021). This table is calculated using data on the credit cards held by 22.5 million consumers in Canada observed over 76 months.

Table 5: Difference-in-differences estimates for the effects of the Quebec policy on delinquency and default during each policy phase

Phase	Any Delinquency Transition (bps) (1)	Any Default Transition (bps) (2)	Any Delinquency (pps) (3)	Any Default (pps) (4)
I	0.0511	-0.0173	-0.0517	-0.1154
	(0.0221)	(0.0156)	(0.1212)	(0.1147)
II	-0.0153	-0.0412	-0.2064	-0.1915
	(0.042)	(0.0252)	(0.2265)	(0.1769)
III	-0.0715	-0.0676	-0.4302	-0.2918
	(0.0395)	(0.0275)	(0.2586)	(0.2034)
IV	-0.0832	-0.0833	-0.5976	-0.4708
	(0.0424)	(0.0358)	(0.2953)	(0.2548)
V	-0.0564	-0.0762	-0.5467	-0.4646
	(0.0596)	(0.0338)	(0.3202)	(0.257)
VI	-0.0256	-0.0778	-0.4864	-0.4214
	(0.0502)	(0.0327)	(0.2756)	(0.2318)
I to VI	-0.0308	-0.0545	-0.3469	-0.2921
	(0.0355)	(0.0258)	(0.2304)	(0.1926)

Notes: Data source is TransUnion. Estimates the effects of the Quebec policy. Each row of this table shows the effects for $k \in \{I, II, III, IV, V, VI\}$ phases of the Quebec policy began, the δ_k^{PHASE} estimates calculated from Equation 4 from our phased difference-in-differences (DID) specification. The last row in each column shows the pooled DID estimates calculated from Equation 5. Both of these DID regressions apply the provincial weights calculated in our SDID. Each column in the table presents estimates from a separate phased regression on a different outcome. The final row of each table also presents results from a separate pooled regression, for that same outcome shown for the phased regressions. The units of columns 1 and 2 are in basis points (bps) and columns 3 and 4 are in percentage points (pps). The outcome "Any Delinquency Transition" 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. The outcome "Any Default Transition" 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 90 or more days past due in this month. The outcome 'Any Delinquency" is whether a consumer has any credit card accounts that are 30 or more days past due. The outcome 'Any Default" is whether a consumer has any credit card accounts that are 90 or more days past due. Standard errors are calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021). This table is calculated using data on the credit cards held by 22.5 million consumers in Canada observed over 76 months.

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6 Supplemental Appendix Accompanying "Evaluating Credit Card Minimum Payment Restrictions"

A Survey Evidence On Credit Card Repayments

Survey of Financial Security (SFS). The 2016 and 2019 Canadian Surveys of Financial Security, conducted by Statistics Canada, ask households about their credit card behaviors. Earlier vintages of the survey (1999, 2005, 2012) ask households only whether or not they usually pay off their credit card balances. All responses are weighted using the provided probability weights. Table A1 reports results of responses to the survey question "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		
	ON	QC	Canada	ON	QC	Canada
% with a credit card	89.1	85.6	87.2	90.7	88.8	89.9
Less than minimum	1.2	1.6	1.4	1.1	0.8	1.4
Minimum	6.2	5.7	5.8	6.6	6.8	6.6
More than minimum but less than full	28.0	28.5	28.9	30.5	27.6	29.6
Full amount	64.5	64.2	63.9	61.9	64.8	62.3

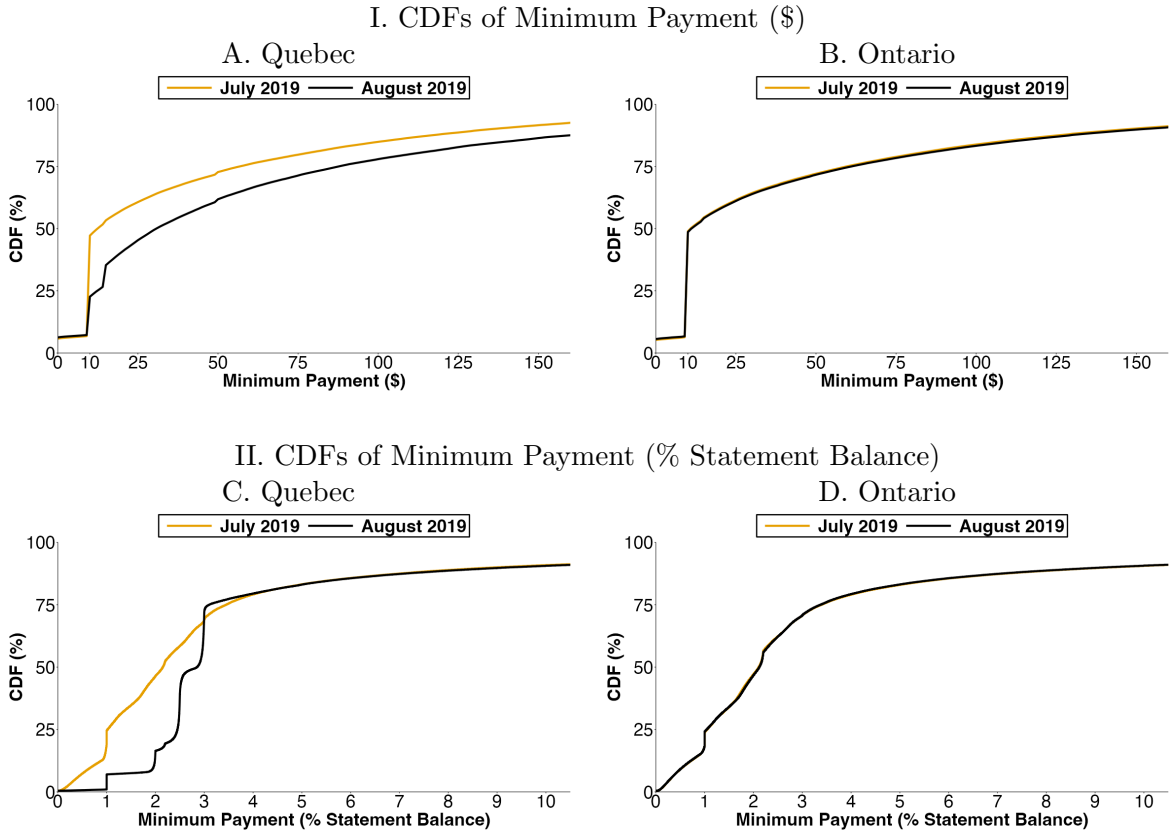
Personal Cardholder Survey (PCS). Every year the marketing firm Ipsos-Reid surveys approximately 10,000 households about their credit cards. Similar to the SFS, Table A2 reports PCS responses for how much consumers typically pay on their outstanding balance. A slightly higher fraction of households in 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		
	ON	QC	Canada	ON	QC	Canada
Minimum	5.5	6.8	5.7	6.8	6.7	5.9
More than minimum but less than full	21.4	23.2	22.5	20.9	23.2	22.6
Full amount	70.4	67.6	69.3	69.3	67.5	68.8
Don't know	2.6	2.4	2.5	3.0	2.6	2.7

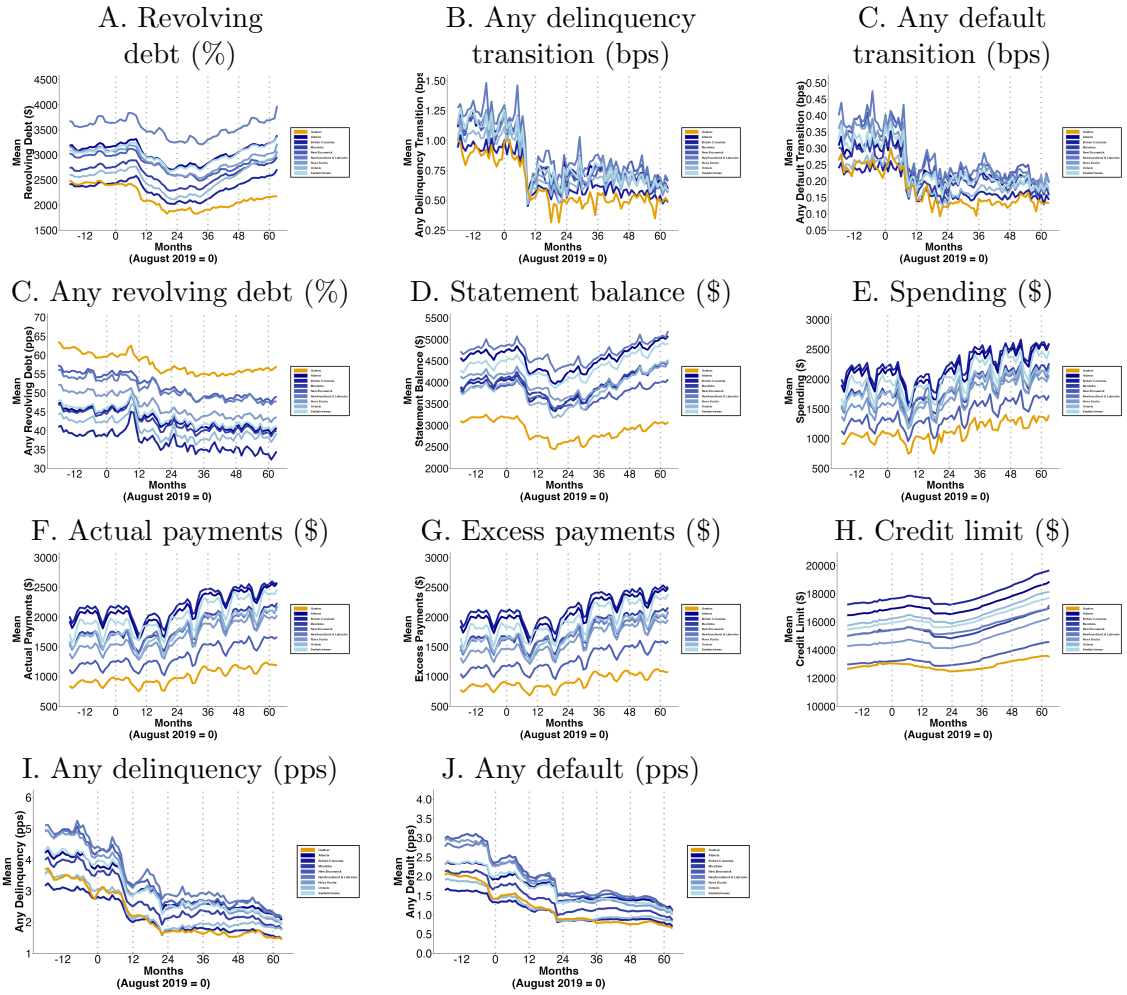
B Additional Results

Figure B1: Distribution of credit card minimum payments for existing cards in Quebec and Ontario in July 2019 (orange line) before the Quebec policy's introduction and August 2019 (black line) when the Quebec policy becomes effective



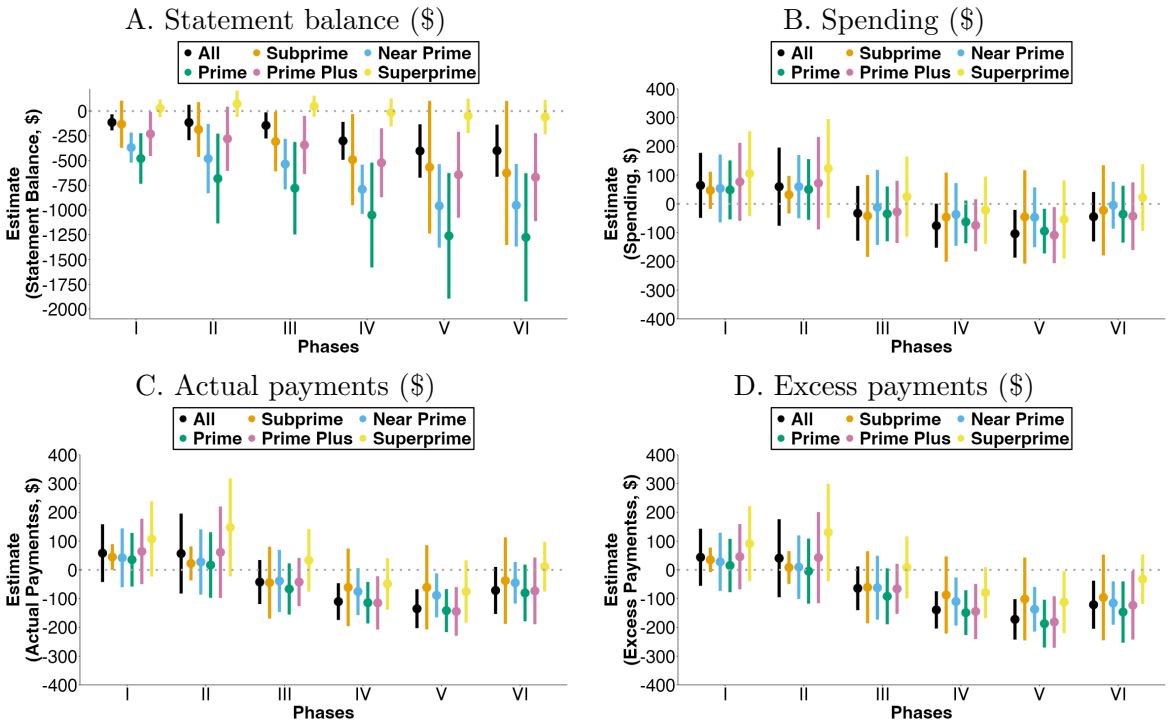
Notes: Data source is TransUnion. Includes all active cards open in Ontario or Quebec as of July 2019 and excludes observations with zero statement balances. In all panels, x-axes of CDFs are right-censored to ease presentation. The minimum payment amount is a combination of interest, fees, and capital repayment. We show Ontario as an example of a province unaffected by Bill 134, results are similar if we also displayed the other unaffected provinces.

Figure B2: Unconditional means of credit card outcomes by province



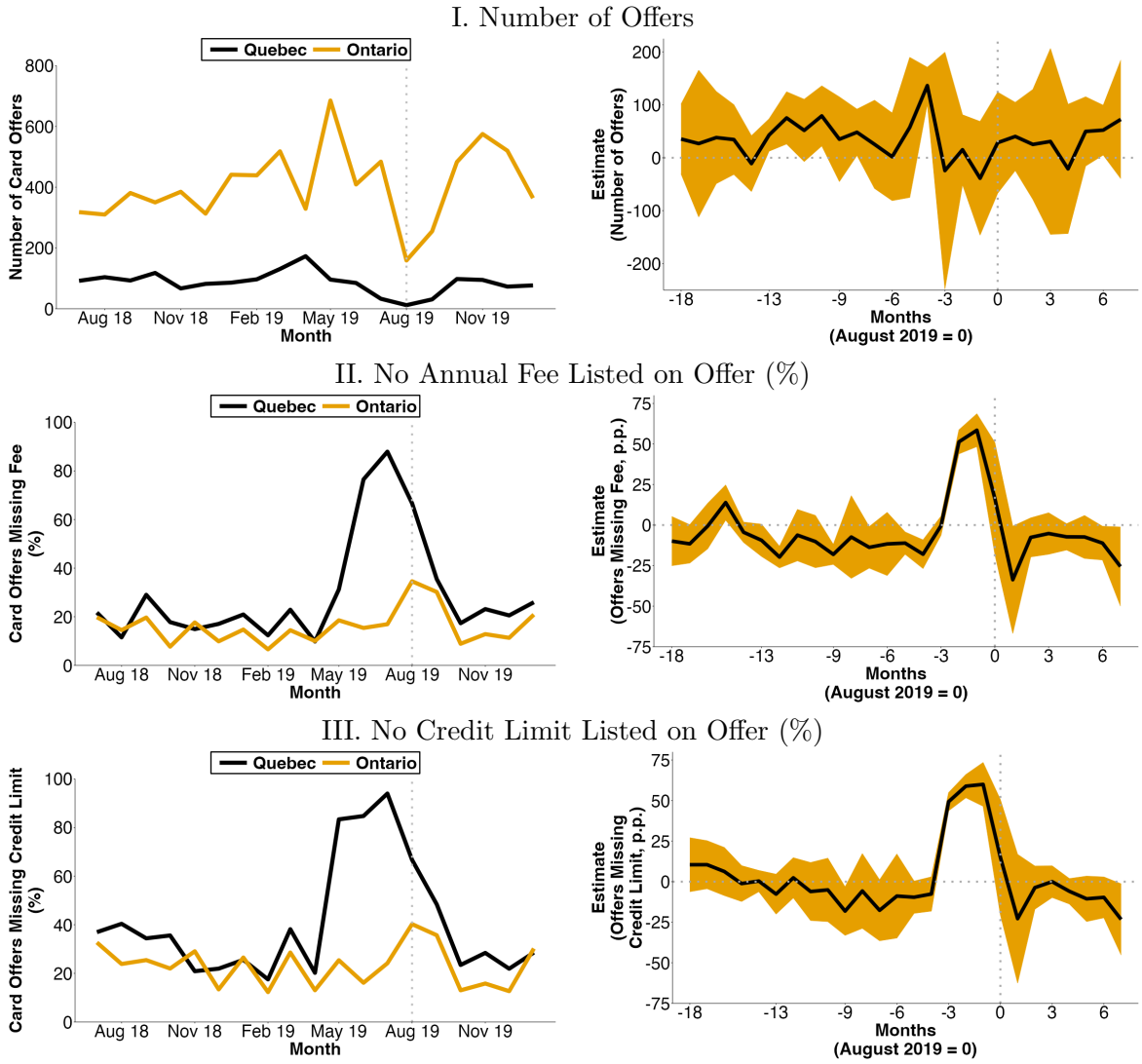
Notes: Data source is TransUnion. Each panels shows unconditional means of a different consumer credit card outcome by province. The outcome in Panel A is credit card revolving debt. The outcome in Panel B is basis points (bps) of a binary variable that takes a value of one if any credit card account transitions from being current in the previous month to being 30 or more days past due in this month.The outcome in Panel D is credit card statement balance. The outcome in Panel E is the total value of new spending on the card. The outcome in Panel F is the total value of actual payments made. The outcome in Panel G is the total value of actual payments made in excess of the minimum payment. The outcome in Panel H is the total value of credit card limits. The outcome in Panel C is a binary variable that takes a value of one if any credit card account is revolving debt. The outcome in Panel I is a binary variable that takes a value of one if any credit card account is 90 or more days past due, and in Panel J if it is 30 or more days past due. The outcome in Panel K is basis points (bps) of a binary variable that takes a value of one if any credit card account transitions from being current in the previous month to being 90 or more days past due in this month. The outcomes in Panels C, I, and J are all measured in percentage points. The outcomes in Panels A, D, D, E, F, G, and H are all measured in Canadian dollars. The dashed gray vertical lines denote months when phases of the Quebec policy begins, increasing minimum payment requirements by 50 basis points from 2% in August 2019 to 4.5% in August 2024. All panels are calculated using data on the credit cards held by 22.5 million consumers in Canada observed over 82 months.

Figure B3: Synthetic difference-in-differences estimates for the heterogeneous effects by credit score for additional credit card outcomes during each policy phase



Notes: Data source is TransUnion. Each panel in this figure presents the estimated effects for a different outcome for each phase of the Quebec policy, the δ_k^{PHASE} calculated based on our synthetic difference-in-differences (SDID) specification specified in Equation 1. Different colors denote the effects estimated for different TransUnion credit score groups calculated in the baseline. Colors denote different credit score groups: subprime (<600), near prime (600-699), prime (700-779), prime plus (780-829), and superprime (830+). In black, all is the estimates across all credit score groups combined. Each phase of the Quebec policy increases minimum payment requirements by 50 basis points from 2% in August 2019 to 4.5% in August 2024. The outcome in panel A is credit card statement balance. The outcome in Panel B is credit card spending. The outcome in Panel C is the total value of actual payments made. The outcome in Panel D is the total value of credit card actual payments made in excess of the minimum payment. The outcomes in panels A, B, and D are all measured in Canadian dollars. Standard errors are calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021), with error bars showing 95% confidence intervals. All panels are calculated using data on the credit cards held by 22.5 million consumers in Canada observed over 82 months.

Figure B4: Additional details on monthly mailed credit card offers



Notes: Data source is Mintel Comperemedia. The left hand panels of this figure summarize the number and characteristics of credit cards offers sent via mail in Quebec and Ontario, each month from July 2018 to January 2020. The right hand panels of this figure apply SDID estimates for Quebec. Panel section I shows the number of credit card offers mailed to consumers in the Mintel panel each month. Panel section II shows, for consumers receiving offers, the percentage where the offer does not list an annual fee. Note that not listing an annual fee on an offer does not necessarily mean a zero annual fee. Panel section III shows, for consumers receiving offers, the percentage where the offer does not list a credit limit.

Table B1: Synthetic difference-in-differences estimates for the effects of the Quebec policy on main outcomes after 60 months, by credit score group

A. Minimum Payment ($)

Months	Subprime	Near Prime	Prime	Prime Plus	Superprime
60	109.01	86.58	73.26	52.61	42.98
	(27.5)	(6.1)	(9.07)	(4.35)	(2.25)
Baseline Mean	215.61	163.2	168.53	115.61	72.06

B. Revolving Debt ($)

Months	Subprime	Near Prime	Prime	Prime Plus	Superprime
60	-627.18	-1031.28	-1309.94	-637.42	-27.65
	(363.51)	(234.43)	(349.32)	(224.83)	(77.76)
Baseline Mean	5144.56	4549.53	4836.01	2476.17	814.99

C. Any Revolving Debt (pps)

Months	Subprime	Near Prime	Prime	Prime Plus	Superprime
60	0.3	-0.81	-1.23	-1.84	-0.11
	(0.71)	(0.84)	(1.13)	(1.22)	(1.12)
Baseline Mean	87.32	83.23	77.61	62.72	49

D. Any Delinquency Transition (bps)

Months	Subprime	Near Prime	Prime	Prime Plus	Superprime
60	0.0465	-0.0355	-0.0556	-0.0242	-0.0207
	(0.4495)	(0.1825)	(0.1113)	(0.0437)	(0.0082)
Baseline Mean	5.4026	2.1167	0.6758	0.1443	0.0079

E. Any Default Transition (bps)

Months	Subprime	Near Prime	Prime	Prime Plus	Superprime
60	-0.1307	-0.0806	-0.0513	-0.0194	-0.0071
	(0.1572)	(0.076)	(0.0248)	(0.0146)	(0.0048)
Baseline Mean	1.3203	0.3116	0.0086	0.0045	0.0015

Notes: Data source is TransUnion. Estimates the effects of the Quebec policy after 60 months by groups of TransUnion credit score calculated in the baseline. Each panel shows a different outcome. Each column shows a different credit score groups: subprime (<600), near prime (600-699), prime (700-779), prime plus (780-829), and superprime (830+). This table presents the estimated dynamic effects for τ months after the Quebec policy began, the δ_τ estimates calculated from Equation 2 from our dynamic synthetic difference-in-differences (SDID) specification specified in Equation 1. The dashed gray vertical lines denote months when phases of the Quebec policy begins, increasing minimum payment requirements by 50 basis points from 2% in August 2019 to 4.5% in August 2024. Months -13 to -18 are used to construct the synthetic control. Standard errors are shown in parenthesis and are calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021). All panels are calculated using data on the credit cards held by 22.5 million consumers in Canada observed over 82 months.

Table B2: Synthetic difference-in-differences estimates for the effects of the Quebec policy on additional outcomes after 60 months, by credit score group

A. Statement Balance ($)

Months	Subprime	Near Prime	Prime	Prime Plus	Superprime
60	-633.41	-1052.76	-1378.59	-702.97	-72.62
	(395.88)	(260.19)	(368.73)	(245.51)	(110.33)
Baseline Mean	5579.31	5256.85	5689.3	3352.09	1626.1

B. Actual Payments ($)

Months	Subprime	Near Prime	Prime	Prime Plus	Superprime
60	-71.19	-112.06	-186.47	-180.64	-108.95
	(73.59)	(32.93)	(40.18)	(34.93)	(33.07)
Baseline Mean	452.84	752.46	947.59	1083.03	995.95

C. Excess Payments ($)

Months	Subprime	Near Prime	Prime	Prime Plus	Superprime
60	-114.3	-162.95	-233.23	-220.43	-150.02
	(72.31)	(33.05)	(43.8)	(35.71)	(32.32)
Baseline Mean	355.75	644.66	837.78	1011.34	955.1

D. Spending ($)

Months	Subprime	Near Prime	Prime	Prime Plus	Superprime
60	-37.22	-49.52	-117.48	-127.77	-88.69
	(86.07)	(42.18)	(45.35)	(40.39)	(48.26)
Baseline Mean	590.31	913.88	1136.75	1254.01	1181.59

E. Credit Limit ($)

Months	Subprime	Near Prime	Prime	Prime Plus	Superprime
60	-847.13	-1327.21	-2018.7	-1540.46	-228.99
	(646.51)	(524.59)	(655.24)	(634.11)	(355.4)
Baseline Mean	8218.59	10019.73	12616.33	13291.84	14555.21

Notes: Data source is TransUnion. Estimates the effects of the Quebec policy after 60 months by groups of TransUnion credit score calculated in the baseline. Each panel shows a different outcome. Each column shows a different credit score groups: subprime (<600), near prime (600-699), prime (700-779), prime plus (780-829), and superprime (830+). This table presents the estimated dynamic effects for τ months after the Quebec policy began, the δ_τ estimates calculated from Equation 2 from our dynamic synthetic difference-in-differences (SDID) specification specified in Equation 1. The dashed gray vertical lines denote months when phases of the Quebec policy begins, increasing minimum payment requirements by 50 basis points from 2% in August 2019 to 4.5% in August 2024. Months -13 to -18 are used to construct the synthetic control. Standard errors are shown in parenthesis and are calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021). All panels are calculated using data on the credit cards held by 22.5 million consumers in Canada observed over 82 months.