Evaluating Credit Card Minimum Payment Restrictions

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Abstract

We study a government policy that restricts repayment choices with the aim of reducing credit card debt. The policy requires credit card minimum payments in Quebec to be at least 2% of the statement balance for cards opened before August 2019 and at least 5% for cards opened from August 2019. The rest of Canada is unaffected. We estimate this policy's effects by applying a synthetic difference-in-differences methodology to comprehensive Canadian consumer credit reporting data. The policy causes a persistent increase in minimum payments. The policy has trade-offs: permanently reducing revolving debt comes at a cost of permanently reducing credit access but only temporarily increasing delinquency.

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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 imposing hard paternalistic policies that restrict consumer choice (Campbell, 2016; Laibson, 2020). Doing so requires estimating the trade-offs of such policies across consumer groups, and then making a policy evaluation to determine whether the costs of restricting choices are worthwhile to achieve the desired policy goal.

We evaluate the effectiveness of hard paternalistic regulation in the context of the Canadian credit card market. In 2019, the Quebec provincial government introduced consumer protection legislation "to prevent over-indebtedness"—restricting consumer choices of how much they must pay each month on their credit card by increasing the required monthly minimum payment.[1] The minimum payment due on a credit card is the minimum amount the cardholder is required to pay in order to remain in good standing with their lender.[2] By increasing the minimum payment, the policy forces all credit cardholders in the province of Quebec to pay more on their credit card (revolve less debt).

Theoretically, increasing credit card minimum payments can have ambiguous effects on consumers (e.g., Castellanos et al., 2023). Forcing credit cardholders to pay more of their credit card balance each month is one way policymakers can attempt to reduce credit card debt. One reason to do this is that high credit card debt increases 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 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), something policymakers might want to internalize when forming regulation.

Increasing minimum payments, however, may be costly. For example, it can force individuals that are liquidity-constrained into delinquency. On the issuer side, it can make some lending unprofitable. By reducing the amount of interest they can collect, lenders might ultimately restrict access to credit card liquidity, which may lead consumers to turn to more expensive methods of credit. We therefore need to empirically estimate the trade-offs

[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

[2] A feature of consumer lending contracts are regular, monthly payments. Reasons for this feature may include keeping an active relationship between the borrower and the lender, keeping the card salient to encourage consumers to be attentive to spend on it, ensuring the lender collects some cash to cover their cash flow needs, and possibly helping to prevent losses from consumer default.

of reducing revolving debt compared to restricting the insurance benefits that credit cards provide, and increasing delinquency.

In this paper, we estimate the effects of the first phase of Quebec's policy. This policy requires that, starting in August 2019, credit card minimum payments must be at least 2% of the statement balance for all cards opened before August 2019 ("existing cards"). The policy also requires that, for new cards opened starting in August 2019 ("new cards"), credit card minimum payments must be at least 5% of the statement balance. We study this policy phase's initial effects to February 2020, just before the start of the COVID-19 pandemic.[3] Furthermore, our analysis is entirely at the card level, and not the borrower level. Approximately 40% of cardholders have only one card, and for these borrowers the analysis is the same. In a future version of the paper, we will analyze the within-wallet use of cards.

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).[4] Before the Quebec policy, 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 the policy 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—the statement balance less payments— and on credit card delinquency. We use comprehensive consumer credit reporting data from TransUnion containing monthly anonymized account-level information on credit cards held by all Canadian credit cardholders. We supplement these with data from Mintel Comperemedia on credit card offers.

We estimate the effects of the Quebec policy on consumers using a synthetic difference-in-differences (SDID) design (Arkhangelsky et al., 2021). 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 that is natural for cases such as ours where only one geographical area, Quebec, is treated, and the difference-in-differences approach commonly used by researchers. Arkhangelsky et al. (2021) and Arkhangelsky and

[3] 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—some lenders temporarily stopped providing timely information, often because of temporary pandemic-related forbearance policies—although take-up of these in Canada was low, as shown in Allen et al. (2022).

[4] 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.

Imbens (2024) demonstrate that SDID typically outperforms both synthetic controls and difference-in-differences approaches.

We find that this policy 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 revolvers (i.e., borrowers who carry a balance month-to-month). The fraction of Quebec credit cards at the lowest feasible minimum payment value of $10 declines from approximately 50% to 20%. Before the minimum payment policy, 46.4% of Quebec credit cards required a minimum payment of under 2% of the statement balance. After the minimum payment policy, the share of cards with a minimum payment of under 2% declines to under 10% of Quebec credit cards. Using a SDID approach, we estimate a $15 average increase in credit card minimum payments in the month that the policy was introduced (August 2019), which is a 13% increase on the baseline. The effect persists and accumulates to a $124 average increase in minimum payments over the first seven statements.

We estimate that the first phase of the policy on existing cards reduces these cards' revolving debt and potentially increases delinquency rates. The policy's effect of significantly reducing revolving debt strengthens over time. Six months after the policy is introduced, revolving debt is $153 lower: a 11.1% decline relative to the baseline. The effect on delinquency shows a one-month 9% significant increase relative to the baseline, however, the point estimates decline over time and are insignificant from zero from months two onwards. This indicates that any increase in delinquency is temporary, and consumers adjust their spending and repayment behaviors. We interpret these results as indicating a surprisingly limited trade-off of higher minimum payments permanently reducing revolving debt at a slight and temporary cost of increased delinquency.

In addition to examining existing cards, we study the policy's effects on new cards. Here, we find evidence that the policy led to a reduction in credit access. There are relatively fewer new credit cards in Quebec, and cards that are issued have lower credit limits relative to the province of Ontario post-August 2019. This difference appears to partially reflect lenders anticipating the policy and encouraging cardholders in Quebec to open new credit cards earlier. Using data on credit card offers, we show that lenders concentrated their mailings in July 2019 to aggressively attempt to bring forward the timing of existing customers in Quebec opening new cards before the 5% policy takes effect. Just before August 2019, lenders' credit card offers in Quebec temporarily have lower interest rates, annual fees, and higher credit limits.

Overall, we find that the increase in minimum payment requirements lead to a permanent reduction in revolving debt and only a temporary increase in delinquency, along with permanent credit rationing. How policymakers trade off these effects depends on how they

measure consumer welfare. Traditional economic models without present bias cannot explain both the observed levels of credit card debt and savings (Laibson et al., 2003, 2024; Zinman, 2015; Gomes et al., 2021). If consumers are present-biased, as is well-documented in the credit card market (e.g., Laibson, 1997; 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, the tightening of credit access and reduced debt is only welfare-improving if the policymaker believes consumers are making behavioral mistakes.[5]

Our paper contributes to literatures spanning household finance, public economics, and behavioral economics by estimating the trade-offs of a paternalistic policy. Allcott et al. (2022) provide theory and empirical evidence evaluating mistakes in the payday loan market and the welfare effects of counterfactual policies. 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.[6] Garber et al. (2024) provides an example for how a government policy in Brazil encouraging increased payroll credit resulted in increased indebtedness with consumers borrowing at high real interest rates with adverse effects (higher consumption volatility and lower consumption) that are inconsistent with consumption smoothing motives and consistent with unsophisticated consumers borrowing "too much". 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 individuals' 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 across countries has found providing information or nudging consumers to be largely ineffective at reducing credit card debt (Agarwal et al., 2015b; Seira et al., 2017; Adams et al., 2022; Batista et al., 2024; Guttman-Kenney et al., 2025), beyond simply reminding consumers to not forget to make a payment (Mazar et al., 2018; Bursztyn et al., 2019; Medina, 2021;

[5]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.

[6]Also see Bethune et al. (2024) and Cherry (2024) for studies examining the effects of interest rate restrictions on unsecured loans. Many papers show that the credit card market has returns in excess of adjusting for risk (e.g., Agarwal et al., 2015b, 2018, 2023b; Herkenhoff and Raveendranathan, 2024; Nelson, 2025; Guttman-Kenney and Shahidinejad, 2025; Deschsler et al., 2025), consistent with market power.

Campbell et al., 2022; Schwartz, 2024). 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, increases delinquency, and reduces credit access.

No prior work has estimated the effects of a market-wide policy forcing all lenders to increase their minimum payments in a developed country. We study this topic in Canada, where 89% of adults hold a credit card (Statistics Canada, 2019), 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 lenders voluntarily changing their minimum payment policies. Keys and Wang (2019) provides evidence of consumers anchoring to the minimum payment, but their approach is not designed to estimate the effects on debt.[7] 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 lender voluntarily raising its minimum payment. Castellanos et al. (2023) examine the effect of one Mexican lender voluntarily conducting a field experiment testing raising minimum payments from 5% to 10% of the statement balance. Agarwal et al. (2023a) examine the effect of a nationwide policy in Turkey that increases minimum payments from 20% to 40% of the statement balance, and this policy also requires consumers to pay at least half of their balance three or more times a year to continue using cash advances and credit limit increases. This Turkish policy largely prevents credit cards being used to revolve debt and is far beyond a politically feasible policy option in developed countries where credit cards are broadly used, such as Canada, the U.K., and the U.S.

This is an early draft working paper. In work-in-progress, we take into account that some consumers hold multiple cards, and therefore experience different levels of treatment. This allows us to study potential spillovers across cards, and the rest of a consumers' debt portfolio. We also have not yet examined heterogeneity by cardholder behaviors, or whether the consumers that make behavioral mistakes are those that lose credit access. Also, in this draft we only examine the first part of the Quebec policy: increasing minimum payments on credit cards opened before August 2019 to 2% in 2019, and to 5% for new cards opened from August 2019. In work-in-progress, we are examining the effects of the other parts of the Quebec policy: increasing minimum payments on credit cards opened before August 2019 by 0.5 percentage points each year from 2.5% in 2020 to 5% in 2025. We intend to incorporate

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

this into a future draft and update our conclusions accordingly.

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 methodologies. Section 3 covers our results for the first phase of the policy that increases the minimum payments on existing cards to 2%. This section shows how lenders' policies changed in response to the policy, and our SDID estimated effects on minimum payments, revolving debt, delinquency. Section 4 shows our results for the part of the policy that affects new cards: increasing minimum payments to 5%. Section 5 briefly concludes.

2 Minimum Payments, Data, and Methodology

2.1 Minimum Payments

2.1.1 Economics and Psychology of 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 (all assuming no further spending).[8] Katz et al. (2024) provide evidence that credit card lenders are incentivized to set "low" minimum payments, as doing so appears to yield higher profits through affecting the repayment choices of behavioral consumers.

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 in order 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).[9] 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 current and future credit access.

Whether a consumer makes repayments above the minimum or not could be driven by temporary liquidity needs or mistakes. Minimum payments tend to be poorly understood

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

[9] In Canada, lenders 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.

by consumers (e.g., Adams et al., 2022; Hirshman and Sussman, 2022). Consumers tend to "bunch" repayments at or just above minimum payment amounts rather than make larger repayments to reduce their level of debt. Such behavior is attributed to the minimum payment having an unintentional psychological default effect (Sakaguchi et al., 2022) and acting as an anchor (Stewart, 2009; Keys and Wang, 2019; Medina and Negrin, 2022) or as a target (Bartels et al., 2024; Schwartz, 2024; Katz et al., 2024).

2.1.2 Quebec Policy

Prior to August 2019, there were no Canadian regulations restricting how credit card lenders 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 minimum payment rules of eleven Canadian lenders in July 2019—each lender's rule was the same across Quebec and the rest of Canada. Lenders choose this contract term, along with other product features, such as interest rates, fees, rewards, and credit limits, to maximize profits. As credit card lenders are large, sophisticated companies, we interpret each lender's choice of their minimum payment rule in Canada before the policy, and afterwards for all provinces in Canada excluding Quebec, as being each lenders' unconstrained profit maximizing choice for this contract feature.

On August 1, 2019, a new regulation, Bill 134, became effective in Quebec.[10] 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 1). The regulation requires that credit cards opened before August 1, 2019 ("existing credit cards") have a minimum payment of at least 2% of the statement 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 statement 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 statement 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.[11]

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 statement balance. During our

[10] This regulation received assent on November 15, 2017, having been announced on May 2, 2017, following earlier unsuccessful attempts to introduce similar legalisation in Bill 24 during 2011–2012.

[11] 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."

period of study (2018—2024), no other Canadian province imposed a minimum payment regulation (either in place or changed).

The overall objective of the regulation is to increase repayments and reduce credit card debt.[12] One of the architects of Bill 134, Quebec politician André Lamontagne, describes why they consider such interventions necessary: "Consumers, and in particular the most vulnerable among them, do not always have the tools to make informed decisions regarding the credit offered to them" and notes that the aim is "to avoid consumer over-indebtedness," (see National Assembly sittings on Bill 134 in October and November 2017). When the regulation came into effect, the Quebec Consumer Protection Office similarly stated "the increase in the minimum payment aims to prevent debt problems," and 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, lenders are required to ensure non-negative amortization of their credit card accounts as part of broader "safety and soundness" supervision designed to ensure lenders 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 plus interest and fees. Discussions with US industry participants indicate 1% is the lowest bound that amortizes debt that can be feasibly chosen by lenders to satisfy regulators. In the UK, lenders' 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

2.2.1 Canadian Consumer Credit Reporting Data

We use data from the Bank of Canada's anonymized consumer credit reporting data sourced from TransUnion (see Gibbs et al., 2025, for a review). These include monthly data covering

[12] Also starting in August 2019, lenders 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.

all Canadians with credit reports between 2012 and 2024, redacted of personal information.[13] We focus our study on the period before the COVID-19 pandemic. Most consumer credit reporting datasets used by researchers are samples—often 1% or 5%—whereas our data, contains the credit histories of more than 30 million Canadian residents. This means we have power to precisely estimate heterogeneous consumer treatment effects.

We observe consumer-level information including age, credit score and the postal code of the consumer's primary address. For each consumer, we observe monthly account-level data 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, we observe outstanding balances—for credit cards this is the statement balance—monthly required payments, monthly actual payments, delinquency status (30, 60, and 90 days late), 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 all credit cards. This enables us to accurately measure consumers' responses to the Quebec policy. We can measure how much consumers pay relative to their credit card minimum payment, how much revolving debt they carry to their next statement, and new spending. This is a notable advantage relative to credit reporting data in the United States where this information is missing for all of the largest credit card lenders from 2015 onwards (Guttman-Kenney and Shahidinejad, 2025). Our dataset enables us to label credit card accounts based on whether they are historically "revolvers" or "transactors". "Revolvers" persistently roll over debt on their card. "Transactors" are convenience users who do not persistently roll over debt on their credit card.[14]

Different to most credit reporting datasets available to researchers, we also observe the name of the credit card issuer, card network, and bank identification number ("BIN"). A BIN is the first four to six numbers that appear on a card, and in addition to revealing information about the issuer and network, it reveals the specific card type (e.g., gold, platinum). This allows us to control for a substantial amount of unobserved heterogeneity across cards.

2.2.2 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

[13] 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).

[14] Repayment behavior is highly persistent, at least over short time-horizons (Keys and Wang, 2019; Nelson, 2025; Grodzicki and Koulayev, 2021; Guttman-Kenney and Shahidinejad, 2025).

mail or email. It includes lender 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. In the U.S., Mintel data has been used, for example, by Grodzicki (2022) and Ru and Schoar (2020), to study how credit card issuers compete for consumers. Han et al. (2018) establish that Mintel data are a good indicator of credit supply.

2.2.3 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 $p \in \{1, ..., 9\}$ nine Canadian provinces that are each observed for 25 calendar-year-months $t \in \{-18, ..., 6\}$.[15] These 25 months start at 18 months before the Quebec's policy takes effect in August 2019 to 6 months after. The last month of data is February 2020, before the onset of the COVID-19 pandemic. Our dataset contains 22.4 million consumers that are in Canada in August 2019, and we observe information on their credit cards for 25 months.

We include all cards that were open before August 2019 when the Quebec policy begins. We retain observations where a cardholder has moved after the policy was introduced, since card features are set based on residential location at the time the policy was introduced and do not adjust with subsequent residential location. 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 as being current, unless the reporting indicates it was delinquent when closed. We winsorize continuous variables to their 99.9 percentile.

2.2.4 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 onwards. We sample all credit cards opened in Quebec and Ontario from July 2018 until January 2020.

We focus primarily on cohorts of cards opened in Quebec and Ontario between August and October 2019 to ensure we have sufficient time to evaluate outcomes before the COVID-19 pandemic's onset. We also add a control group of cohorts of cards opened in both Quebec and Ontario between August and October 2018.For each card, we keep up to three months

[15] We exclude the tenth province of Prince Edward Island as it is small, with a population of less than 200,000.

of observations: months three to six after card opening. By the third month, most newly opened credit cards have started to appear in credit reports, which allows sufficient time for a card's first full statement with a non-zero minimum payment due to occur, and for statement balances to include balance transfers.

2.2.5 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 (e.g., paying their outstanding balance, making payments before their statement and minimum payment becomes due). Given that credit cards have a 21-day grace period, statement balances are recorded in month $t-1$ rather than in month t.

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

- **Delinquency** is measured as any missed payment recorded in the credit report. This occurs when an account is 30 days or more past the date when the minimum payment is due.

2.3 Methodologies

2.3.1 Existing Cards

We estimate the effects of changes to credit card minimum payments in Quebec on 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). This methodology does not require the parallel trends assumption of difference-in-differences, instead it reweights and

matches to pre-policy trends. In addition, unlike synthetic controls, but as with difference-in-differences it allows for causal effects to be accurately estimated even if there are differences in the levels of outcomes. We evaluate the effects of changes in Quebec compared to a control group of other Canadian provinces. Our SDID specification is shown in Equation 2:

$$\left(\hat{\delta}, \hat{\mu}, \hat{\alpha}, \hat{\beta}\right) = \underset{\delta_\tau, \mu, \alpha, \beta}{\operatorname{argmin}} \Big\{ \sum_{p=1}^{9} \sum_{t=-18}^{6} \left(y_{p,t} - \mu - \alpha_p - \beta_t - \delta(\mathbb{I}\{t \geq 0\}_t \times \mathbb{I}\{QUEBEC\}_p)\right)^2 \hat{\omega}_p \hat{\lambda}_t \Big\}. \quad (2)$$

In this equation, we have one observation per province, p, per calendar year-month. The term $y_{p,t}$ denotes our outcome of interest. We have fixed effects for each province, α_p, and each time period, β_t. An important distinction of SDID from difference-in-differences is that SDID constructs weights on each province, ω_p, but also on each time period, λ_t to construct a synthetic Quebec from the eight potential control provinces over time.

The theoretical synthetic controls literature is currently grappling with how best to approach multiple outcomes (Tian et al., 2024; Sun et al., 2025). One approach is to construct different synthetic controls for different outcomes, however, this appears unsatisfactory as it may construct a different synthetic control weight for each outcome that makes it conceptually challenging to interpret results across multiple outcomes. Instead, we calculate one set of weights that we apply across all our regressions with different outcomes. We compute the province and time weights only using the six months of data that occur twelve to eighteen months before Quebec's policy went into effect. We only use statement balances as an outcome to calculate these weights. This approach enables us to have three separate ways to evaluate whether our weighting strategy provides a suitable control for Quebec. First, if the estimates are zero before the policy 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 that further supports synthetic Quebec as a control. Third, if the effects of the policy to increase minimum payment emerge exactly at the time of the policy, despite us not using this information for our weighting, this supports our approach. In our results section, we show that our chosen methodology passes all three of these tests. Table 2 shows that each province receives a fairly similar share in the synthetic Quebec, with Saskatchewan having the lowest weight of 0.099 and New Brunswick the highest weight at 0.152.

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:

$$\delta_\tau = \left(\bar{y}_t^Q - \bar{y}_t^{SQ}\right) - \left(\bar{y}_{baseline}^Q - \bar{y}_{baseline}^{SQ}\right) \tag{3}$$

The term $\bar{y}_t^Q$ is the average outcome for Quebec ($p = 1$) at time t, and similarly, $\bar{y}_t^{SQ} = \sum_{p=2}^{9} \hat{\omega}_p y_{p,t}$, shows the average outcome across each of the eight non-Quebec provinces ($p \neq 1$) , after applying the SDID province 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 by $\bar{y}_{baseline}^Q = \sum_{k=-18}^{-13} \hat{\lambda}_k y_{1,k}$ and $\bar{y}_{baseline}^{SQ} = \sum_{k=-18}^{-13} \sum_{p=2}^{9} \hat{\omega}_p \hat{\lambda}_k y_{p,k}$ for Quebec (Q) and our synthetic Quebec control (SQ) respectively, where k is event time.

For estimation, we define event time period zero as twelve months before August 2019 to allow for potential anticipation effects. This "backdating" approach follows the recommendations of Abadie (2021) as a way to address potential anticipation effects. When we present our results, we refer to event time period zero as August 2019 to more clearly refer to the timing that the Quebec policy comes into effect, and therefore also use this timing in the specifications presented in this methodology section to be consistent across the paper.

We estimate standard errors following the placebo variance estimation approach of Arkhangelsky et al. (2021) (Algorithm 4 in their paper) that they recommended for cases such as ours with a single treated cluster (Quebec) where the asymptotic properties of other approaches such as bootstrapping would not hold because they require that the number of treated units is large.

2.3.2 New Cards

We also study how the Quebec policy impacted new credit cards, defined as those opened after the policy came into effect, i.e., from August 2019 onwards. We do so by aggregating cards into cohorts by the combination of their opening month and province. We then track outcomes on these cohorts in months since origination ("vintage months").

We describe how the extensive margin of the number and value of originations change, and then study the intensive margin of how outcomes change, for the selected sample of new cards opened. Our First-Difference (FD) methodology compares outcomes for cohorts of cards that originated in Quebec and Ontario that are opened between August and October 2019. Our sample is one observation per cohort year-month (c), province (p), vintage month (v). Each observation occurs at calendar time t. As it takes a few months for a new credit card to appear in a credit report, with a full statement cycle and minimum payment due, we

show results from vintage months three to six (before cohorts are impacted by COVID-19). We estimate Equation 4, where we weigh each observation by the number of cards in each cohort.

Our parameters of interest are δ_v^{FD}, which show the interaction between vintage month indicators (D_v) and an indicator $QUEBEC_p$ equal to 1 if the card is located in Quebec and 0 otherwise. We also include fixed effects for each cohort, vintage month, and calendar year-month.

For our estimates to be interpreted causally, we require that in the absence of the Quebec policy, outcomes for cohorts of cards opened in Quebec after the policy would have been similar to those opened in Ontario after the policy, controlling for fixed effects. A limitation of our FD approach is that, unlike our existing cards SDID approach, there is no pre-period. As a result, we cannot include card fixed effects, and therefore our estimates can be biased by time-invariant differences between provinces.

$$y_{c,p,v,t} = \sum_{v=3,\ldots,6} \delta_v^{FD}\Big(D_v \times QUEBEC_p\Big) + \gamma_c + \gamma_{v(c,t)} + \gamma_t + \varepsilon_{c,p,v,t}. \tag{4}$$

Going forward, we seek to address this bias in our DID methodology by adding a control group of cohorts of cards opened between August 2018 and October 2018 in both Quebec and Ontario. We choose these controls given seasonality in card openings, and also to ensure that we observe six months of outcomes for these Quebec cards before they are impacted by the increases in minimum payments to 2% for existing cards opened before August 2019. We estimate Equation 5. As with Equation 4, our specification includes fixed effects for each cohort, vintage month, and calendar year-month. Unlike Equation 4, this specification now includes a fixed effect for card cohorts opened in Quebec ($QUEBEC_p$).

Our parameters of interest in this regression are the coefficients on the triple interaction between indicators for vintage months (D_v^{DID}), an indicator for card cohorts opened in Quebec ($QUEBEC_p$), and an indicator for card cohorts opened from August 2019 onwards ($CPOST_c$). For the δ_v^{DID} coefficients to be interpreted causally, we require that in the absence of the Quebec policy, the difference in outcomes between cohorts of cards opened in Quebec after the policy, and those opened in Quebec before the policy, would have trended similarly to the difference in outcomes between cohorts of cards opened in Ontario after the policy to those opened in Ontario before, after controlling for fixed effects. The fixed effects included are for the interaction between indicators for vintage months and card cohorts opened in Quebec, and the interaction between indicators for vintage months and an indicator for card cohorts opened from August 2019 onwards.

$$y_{c,p,v,t} = \sum_{v=3,\ldots,6} \Big[\delta_v^{DID}\Big(D_v \times QUEBEC_p \times CPOST_c\Big) + \alpha_v(D_v \times QUEBEC_p) + \beta_v(D_v \times CPOST_c)\Big] + QUEBEC_p + \gamma_c + \gamma_{v(c,t)} + \gamma_t + \varepsilon_{c,p,v,t}. \tag{5}$$

3 Results: Existing Cards

This section presents our results for the effects of the Quebec minimum payment policy on accounts opened before August 2019. Table 3 shows the baseline means of outcomes in Quebec. We see that the mean credit card minimum payment for a consumer, in total across their cards held, each month is $117. Their average statement balance is $3,235, and of this, they have $1,362 in revolving debt, on average. Only 2.73% of consumers have any delinquency on any of their credit cards. And their average credit card limit is $12,431.

3.1 Minimum Payment

The "first stage" is how the Quebec policy 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 Lender Minimum Payment Policies

Table 1 summarizes how lenders changed their minimum payment rules for Quebec credit cards but did not change them in the rest of Canada. Before the policy, seven out of the eleven lenders had minimum payment rules below 2% of the statement balance, and so were forced to tighten their minimum payment rules for their existing Quebec cards. Two lenders tightened their minimum payment rule to 2.0% of the statement balance, and three lenders did so to 2.5% of the statement balance. These five lenders all previously had a very low minimum payment rule that required consumers to pay only $10 plus interest and fees. Two lenders increased their minimum payment to 3.0% of the statement balance—one from $10 plus interest and fees, and the other from 1% of the statement balance. The remaining four lenders already had minimum payment rules at 2% or higher and so were not mandated to tighten their minimum payment rules in the first policy phase, and indeed did leave their rules unchanged at 2.0% (two lenders), 2.5%, and 3.0% of the statement balance, for this first phase of the policy. We do not have a great explanation for the different lender 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. Finally, all eleven lenders had minimum payment rules below 5% of the statement balance and all of these 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. Figure 2 shows the mean credit card minimum payment for consumers in Quebec over time. This shows a clear increase in credit card minimum payments at event time zero, August 2019, the month when the Quebec policy comes into effect.

Figure 3 shows the cumulative distribution function (CDF) of credit card minimum payments for credit cards active in July 2019 in Quebec (Panels A and C) and in Ontario (Panels B and D).[16] In each panel, the orange line shows the CDF for cards open in July 2019—the month before the Quebec policy took effect, and the black line shows this for August 2019—the month after the Quebec policy took effect. Panels A and B show the minimum payment in levels of Canadian dollars. Panels C and D show the minimum payment as a percentage of the statement balance (excluding observations when statement balances are zero).

The Quebec policy immediately increases credit card minimum payments in Quebec but not in Ontario. Panel A of Figure 3 shows the fraction of Quebec credit cards with a minimum payment of less than or equal to $10 declines from 47% to 23%. The Quebec minimum payment distribution shifts to the right, showing higher minimum payments are increasingly common.

Panel C of Figure 3 shows that prior to the minimum payment policy, over 46% of Quebec credit cards had a minimum payment of under 2% of the statement balance. After the minimum payment policy, this declines to under 10% of Quebec credit cards.[17] Cards increasingly have minimum payments at 2%, 2.5%, and 3% of statement balances, or amounts just above these, as would be expected if interest and fees are added.[18]

Between July and August 2019, there is no change in the distribution of minimum payments in Ontario. This result is robust irrespective of whether we measure minimum pay-

[16] This pattern also holds for other provinces outside Quebec. We only show Ontario to ease presentation.

[17] There are a couple of reasons why this does not fall to zero cards: (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.

[18] The fraction of Quebec cards with minimum payments below 2.05% of the statement 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%.

ments in levels (Panel B), or as a fraction of the statement balance (Panel D). Results are similar if matching card characteristics across provinces, as shown in Appendix Figure B1. This descriptive evidence validates our SDID experimental design. The Quebec policy clearly increases minimum payments in Quebec without affecting other provinces.

3.1.3 Causal Evidence

We use our SDID approach to estimate the causal effect of the Quebec policy on minimum payments. Figure 4 shows how the estimated effects change over time (δ_τ from Equation 2). This and subsequent figures all show 95% confidence intervals from standard errors calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021).

Figure 4 is extremely reassuring for our SDID methodology. It shows no pre-trends before the policy comes into effect, and shows the policy having an effect at exactly the time that we would expect it to, August 2019 which is event time zero in this figure. These results are achieved despite our SDID methodology only using information on statement balances 18 to 13 months before the policy began, and no information on minimum payments or other card behaviors. As we will go on to show, our other results are also similarly reassuring, and therefore we are confident that our synthetic Quebec is a good control group of Quebec.

We estimate an immediate and persistent increase in minimum payments in Quebec when the policy came into effect. In the month that the policy is introduced, the average increase in minimum payments is \$15.00, one month later is \$17.73 (Table 3) and declines slightly six months later to \$15.45 (Table 4). These are increases of 13%, 15%, and 13% relative to Quebec's baseline mean minimum payment of \$117. If we sum up the minimum payments over the first seven statement cycles, this is a \$124 average increase in minimum payments.

The slight decline in the level of minimum payments over time may be consistent with cardholders carrying lower statement balances. This decline could arise from holding less revolving debt, spending less, incurring less in financing charges (interest or fees), or a combination of these. We evaluate these potential explanations in the following sections.

3.2 Revolving Debt

As minimum payments under the new policy are a function of the statement balance, the fact that we observe a decrease in minimum payments from when the policy is introduced to six months later indicates cardholders are revolving lower debt.

The estimates presented in Figure 5 Panel A show that the policy reduced revolving debt over time. September 2019 ($t = 1$) is the first month when payments are due against the August 2019 statements with higher minimum payments. We estimate that the policy has

a statistically insignificant decrease in revolving debt by $8 in September 2019 (Table 3). However, the effect grows over time. Revolving debt declines by $152.52 in the sixth month after the policy is introduced (Table 4). Relative to Quebec's baseline mean revolving debt of $1,362 these effects represent a decline in revolving debt of 11.1% by February 2020.

When interpreting our effects, it is important to consider how substantial heterogeneity in credit card repayment behaviors limits how large any average treatment effect on revolving debt can feasibly be. We would not expect a one-to-one pass-through from mean minimum payments to mean revolving debt because the consumers who already repay their statement balance in full have a revolving debt of zero and this is bounded at zero irrespective of the minimum payment. This indicates that our estimated average reduction in revolving debt is primarily expected to be driven by the accounts that were revolving debt before the policy.

How do our results compare to the existing literature? Our results contrast with Castellanos et al. (2023), who study one Mexican bank and find that the increase in minimum payment from 5% to 10% caused an immediate increase in debt—due to increasing delinquency leading to late payment fees. Within nine months of the policy, however, the authors document a decline in debt that is imprecisely estimated such that increases in debt cannot be ruled out. Such a difference in results may be expected for a couple of reasons. First, the Mexico experiment involves a far higher minimum payment than we observe in Canada. Second, Mexico is a developing country where fewer than 10% of households use credit cards, where cardholders have much higher delinquency rates than credit card markets in developed countries such as Canada, the U.S., and the U.K. In developed countries, neither Keys and Wang (2019) nor d'Astous and Shore (2017) are designed to, or have the power to, detect effects of increasing minimum payments on reducing debt, though results from both suggest this may be the case.

3.3 Delinquency

The most natural trade-off of higher minimum payments is the cost of forcing constrained cardholders, who cannot afford the higher minimum, into delinquency. Figure 5 Panel B shows our estimates for how the Quebec policy affects the likelihood of being delinquent (30+ days past due).

Our SDID estimates indicate that the policy significantly increases the likelihood of being delinquent in the first month after the first policy was introduced by 0.25 percentage points (Table 3). This is a 9.1% increase in delinquency on the Quebec baseline mean of 2.73 percent. This adverse effect is not persistent, as is clear in Figure 5 Panel B. The point estimates on delinquency decline over time and are insignificant from zero from months

two onwards. Six months after the policy was introduced the effect on delinquency remains insignificant from zero with an estimate of −0.02 and a standard error of 0.07 (Table 4). This indicates that any increase delinquency is temporary, and consumers adjust their spending and repayment behaviors.

We interpret these results as indicating a surprisingly limited trade-off of higher minimum payments permanently reducing revolving debt at a slight and temporary cost of increased delinquency. How do these results compare to prior estimates? Castellanos et al. (2023) found that in Mexico, increases to minimum payments had no significant increase in default—defined as failing to meet the minimum payment in three consecutive monthly payments—in the first eight months, but then default rates increase over nine to fourteen months, with a persistent, stable effect for up to 26 months (the end of the experiment). 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 delinquency, measured by write-offs, increases by 0.04 percentage points after 12 months.

3.4 Other Outcomes

Consistent with the pattern observed for declining revolving debt over time, we also observe that the policy significantly lowers statement balances over time as displayed in Figure 6 Panel A. Table 4 shows that six months after the policy, the policy reduces average statement balances by $81.7. This is a decline of 2.5% relative to the Quebec baseline mean of $3,235.

Figure 6 Panel B shows the effects of the policy on credit card limits. The policy causes a decline in consumer's average credit card limits by −189 after six months. This represents a decline of 1.5% relative to the baseline mean of $12,431, as shown in Table 4. This result is informative because given that consumers are revolving less debt on average, this would be expected to reduce the interest revenue for lenders. One potential avenue for lenders to offset some lost revenue would be to encourage increased spending through higher credit card limits, generating more interchange revenue. However, our results go in the opposite direction, ruling this out. Instead it appears that lenders are slightly reducing credit access, which would be consistent with some consumers becoming unprofitable to lend as much to at higher levels of credit card minimum payments. We explore the implications of the policy on credit access by studying new card openings in the next section.

4 Results: New Cards

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 lenders tightened their minimum payment policies in Quebec to 5%—the lowest level allowed. These lenders left their policies unchanged in Ontario, and also across the rest of Canada. Table 1 Panel B shows that there is a sharp tightening in minimum payments in Quebec relative to that required by the same lenders for cards opened just a month earlier, or in Ontario pre- and post-policy.

4.1 Card Openings

Figure 7 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. A combination of three reasons may explain this. First, lenders 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, lenders might have expanded their marketing efforts to bring forward the timing of when customers opened new cards. This appears likely given the timing: 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% repayment requirement might no longer be profitable at 5%. As a result, lenders 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 7 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 onwards, 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 7 Panels E (levels) and F (indexed). These two series closely track one another until October 2019. Among cards opened, the mean credit limits of cards opened in October or November 2019 in Quebec is relatively lower than in Ontario.

In the Appendix we also show that credit limits are decreasing. Using the FD estimator, limits decrease by $632 five months post-policy, and $603 six months post-policy. The results from the DID are much smaller, -$51 and $9 for months five and six, respectively.

4.1.1 Credit Supply

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 Bill 134 came into effect. Here we take advantage of credit card offers, collected by Mintel for a panel of Canadian households, to investigate the supply of cards in the market.

Figure 8 and Appendix Figure B2 plot the defining features of card offers between 2018 and 2020 for Quebec and Ontario. 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. Focusing on Figure 8 Panel B, 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, lenders in Quebec offer lower interest rates (Panel C), lower annual fees (Panel D), and higher credit limits (Panel E). Post-August 2019, we see a return to normal. These patterns are consistent with lenders 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. As a result, we think that most, if not all, of the increase in cards reported in TransUnion comes from a targeted increase in supply before the policy.

4.2 Minimum Payments

Cohorts of cards opened in Quebec from August 2019 onwards had substantially higher minimum payments than cohorts of cards opened before August 2019 in Quebec, or those opened before or after in Ontario. Figure 9 Panel A displays the unconditional mean of

minimum payments for each cohort of newly opened credit cards in months since origination. Each line shows a cohort of cards opened in a province in a month. Quebec card cohorts are in black, and Ontario card cohorts in orange. Lines are solid with circled points if cohorts are card cohorts opened after August 2019, and dashed lines without circled points are card cohorts opened before August 2019. This figure shows these results for cohorts of cards opened in August to October of 2018 and 2019, while Appendix Figure B3 shows all cohorts from July 2018 to November 2019.

We use our two regression approaches (FD and DID) to formalize this descriptive evidence. Figure 10 Panel A shows our mean estimates of δ_{υ}^{FD} and δ_{υ}^{DID} for each vintage month. Both methodologies show minimum payments persistently increase over time and, six months after card opening are approximately $34 relative to Ontario cards by our FD method, and $17 relative to the difference between Quebec and Ontario cards by our DID method.

4.3 Revolving Debt

Figure 9 Panel C shows that the unconditional average revolving debt five to six months after card opening is lower in Quebec for cohorts after August 2019 than those cohorts before. This is also true, however, for Ontario cohorts.

Post-policy implementation, revolving debt is also lower for cohorts of cards opened in Quebec after the policy than for cards opened in Ontario. Figure 10 Panel C shows our FD estimate of the policy impact on Quebec cohorts revolving debt six months after card openings is -$110.

Five and six months after card openings, our DID estimate on the change in revolving debt is slightly higher, $14 to $15, in the Quebec cohorts relative to the Ontario cohorts. Results for statement balances in the Appendix (Figure B4) show a similar pattern of balances declining in FD estimates (-$142 and -$119 after five and six months, respectively) and increasing slightly in DID estimates (-$2 and +$10 after five and six months, respectively).

When interpreting these results, it is important to highlight that these DID estimates reflect both how the policy affects the composition of cardholders (e.g., changing lenders' criteria for approving applications and setting credit limits), and changes in how cards are used (e.g., changing consumer repayment and spending behavior). We plan to run regressions with controls pre-card opening (e.g., age and credit score) to control for the composition of cardholders, which then enables us to isolate the effects of minimum payments on consumer behaviors.

4.4 Delinquency

Unconditional means (Figure 9 Panel D) show delinquency rates are higher, on average, in Quebec for cohorts after August 2019 than those cohorts before; however, this is also the case for Ontario cohorts. We measure delinquency by whether a card is delinquent at any month to or before that date.

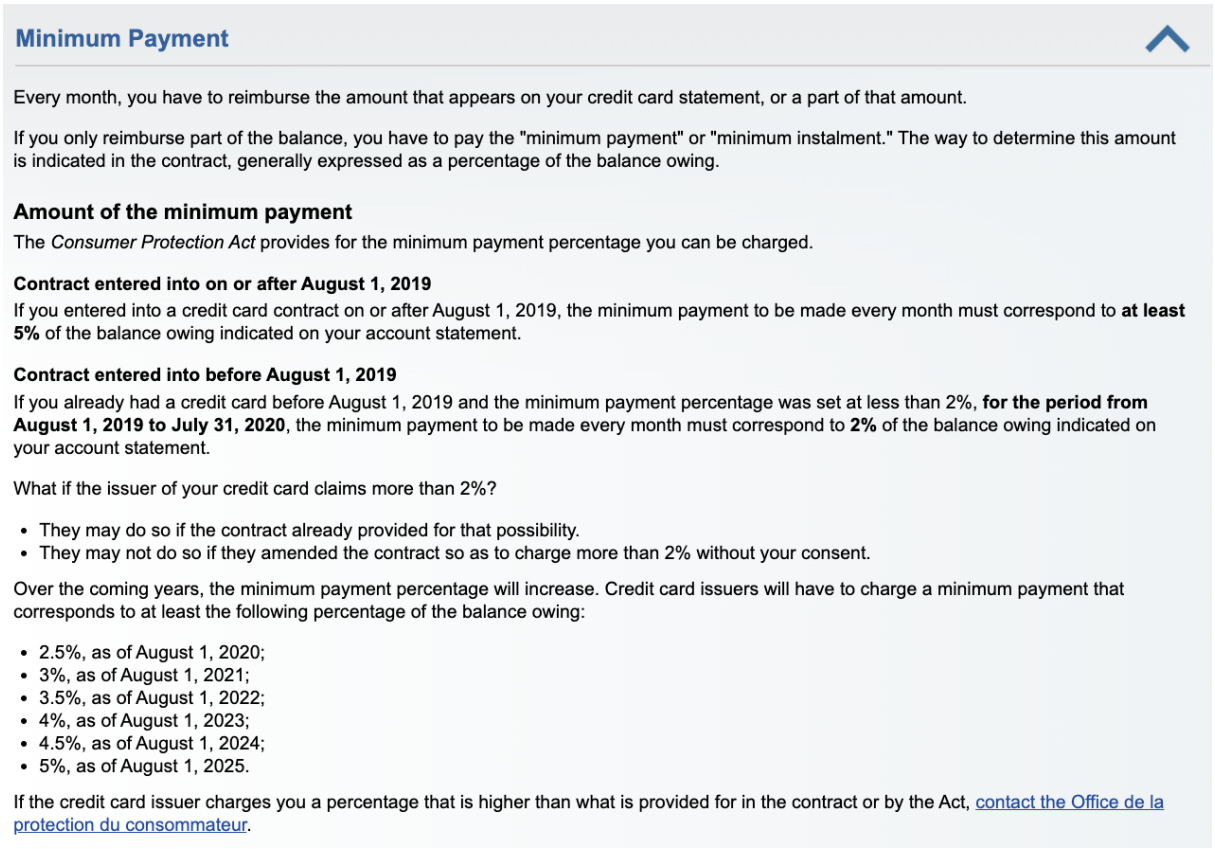
Estimates on how delinquency rates change following the Quebec policy are similar by both FD and DID estimation approaches (Figure 10 Panel D). After six months, delinquencies are 0.4 (FD) to 0.5 (DID) percentage points higher for cohorts of cards opened in Quebec after the policy compared to the control cohorts.

5 Conclusions

This paper provides an analysis of the initial impact of a paternalistic government policy which restricts consumers' payment choice by tightening credit card minimum payments in Quebec but not in the rest of Canada. We use a synthetic difference-in-differences approach to estimate the causal effects of this policy. We find that the policy was effective at reducing revolving debt but this comes at a cost of reducing credit access, and potentially temporarily increases delinquency for credit card revolvers. 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 such evaluations.

We plan to extend our analysis to examine the effects of this policy over a longer time horizon, and across heterogeneous groups. Doing so will allow us to estimate the trade-offs for how different levels of minimum payments impact revolving debt, delinquency, and credit access. This enables us to better evaluate a paternalistic policy to reduce credit card debt to inform consumer financial protection regulators about whether to make policy constraining lenders' minimum payment policies. We intend to incorporate this analysis into a future draft and update our conclusions accordingly.

Figure 1: 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.

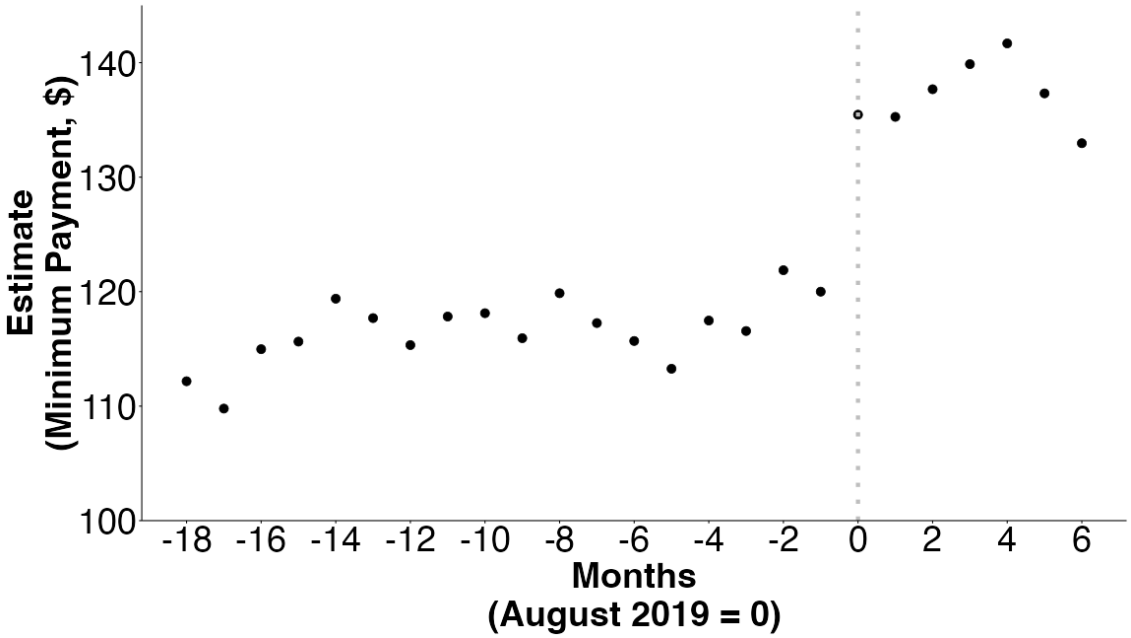
Over the coming years, the minimum payment percentage will increase. Credit card issuers will have to charge a minimum payment that corresponds to at least the following percentage of the balance owing:

- 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.

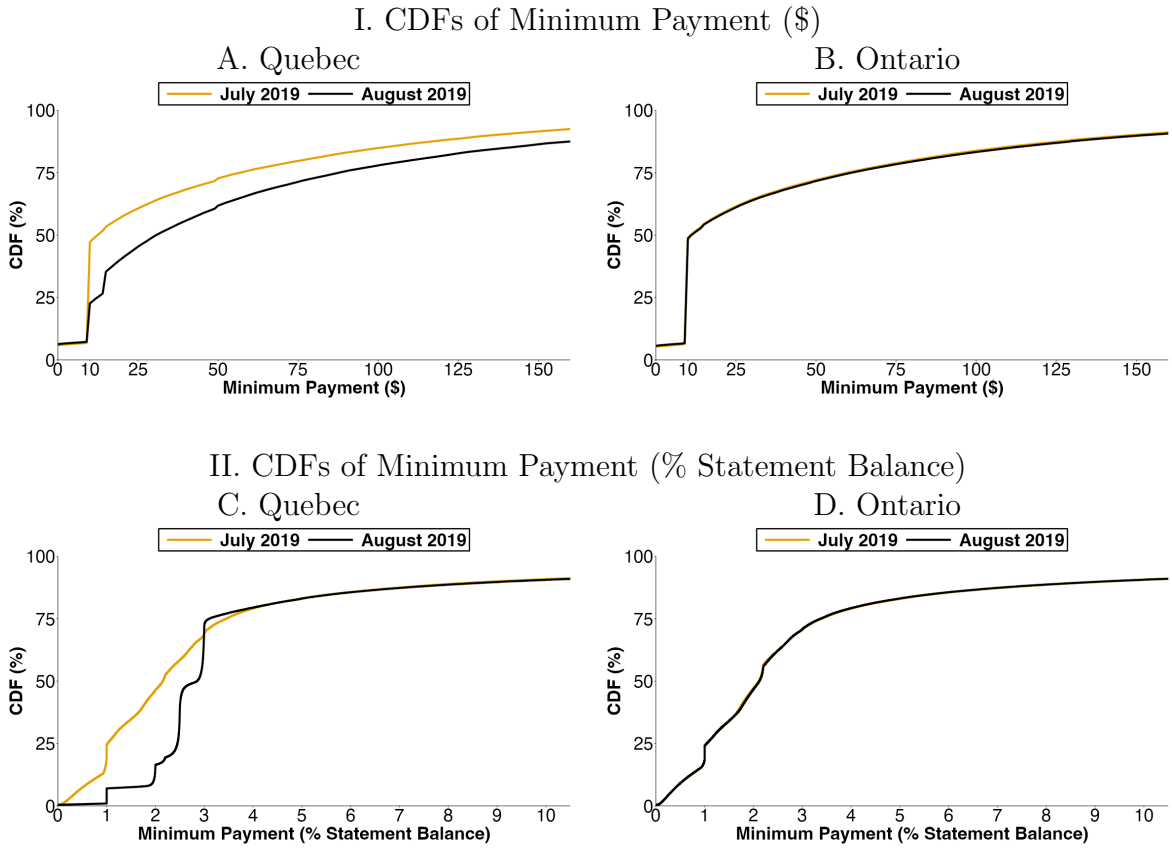
Notes: Data source is Québec Office de la Protection du Consommateur.

Figure 2: Mean consumer credit card minimum payments in Quebec, relative to August 2019 when the Quebec policy begins



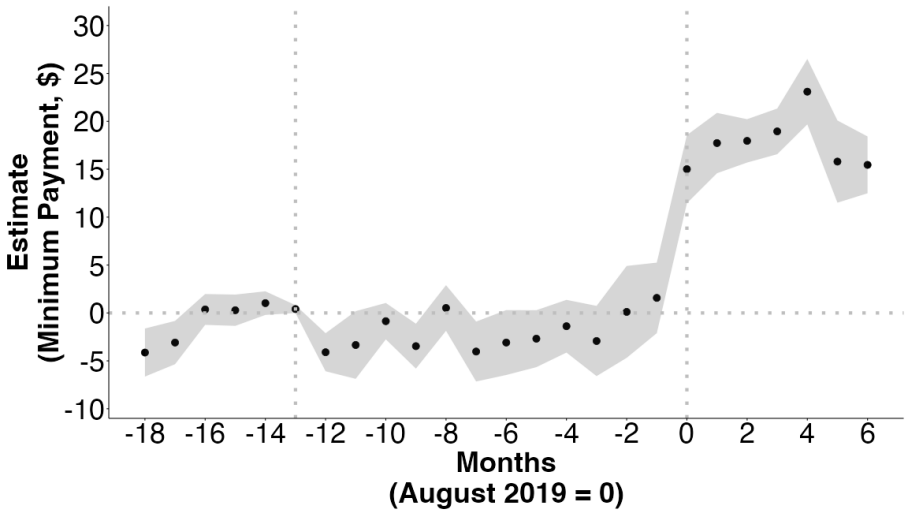
Notes: Data source is TransUnion. The dashed gray vertical line denotes August 2019 when the Quebec policy begins. This figure is calculated using data on the credit cards held by 5.4 million consumers in Quebec.

Figure 3: 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



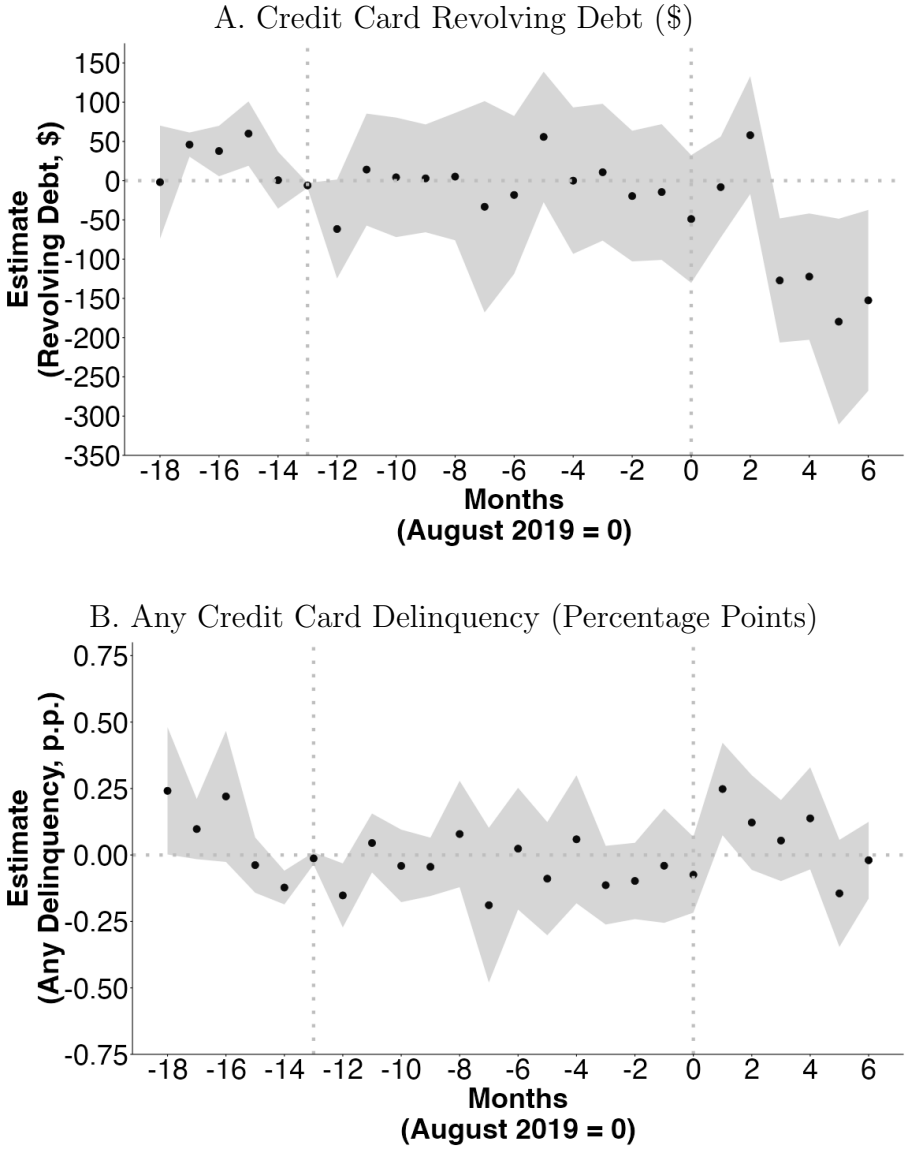
Notes: Data source is TransUnion. Includes all active cards open in Ontario or Quebec as of July 2019 and excludes observations with zero statement balances. In all panels, x-axes of CDFs are right-censored to ease presentation. The minimum payment amount is a combination of interest, fees, and capital repayment.

Figure 4: Synthetic difference-in-differences estimates for effects of policy on credit card minimum payments



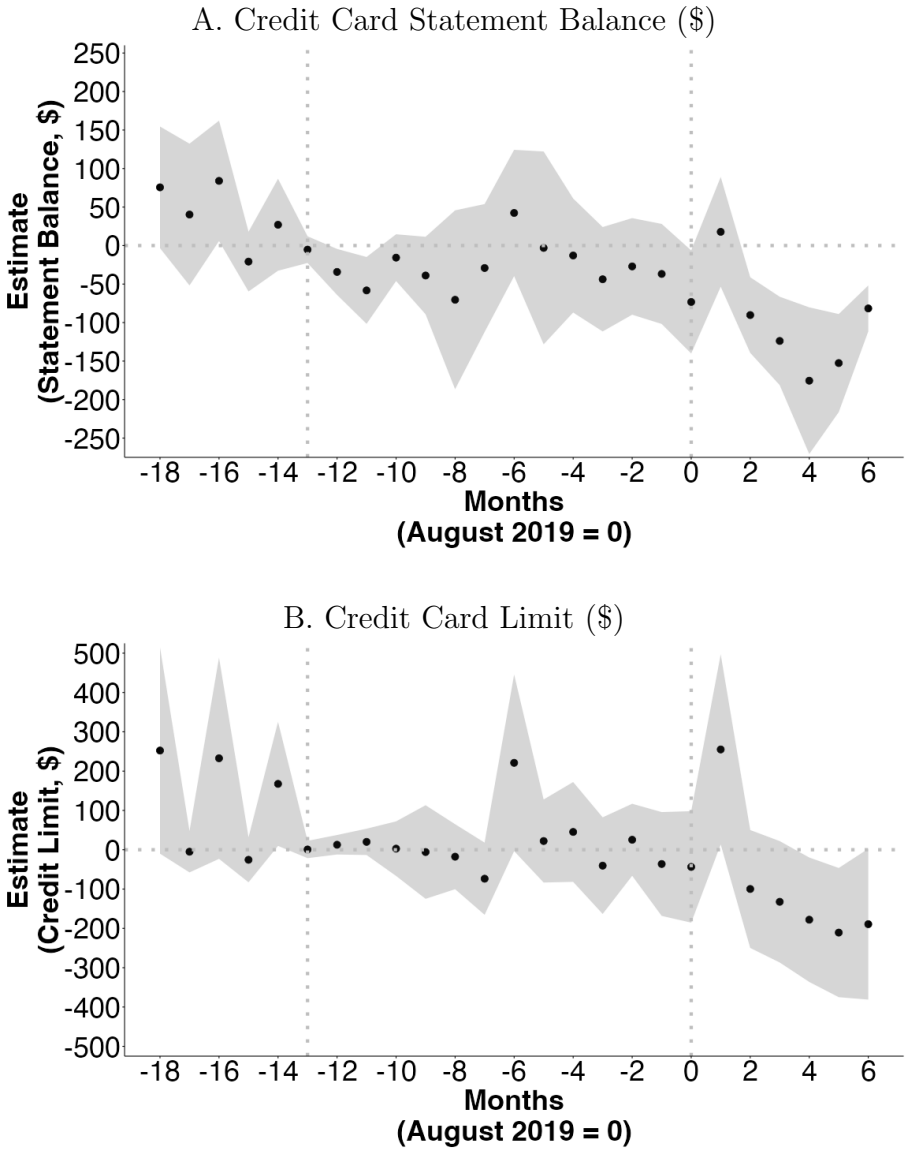
Notes: Data source is TransUnion. Estimates for the effect of the first phase of the Quebec policy requiring credit card minimum payments for existing cards to be at least 2% of statement balance. The outcome is credit card minimum payment in $. We plot the δ_τ estimates from our dynamic synthetic difference-in-differences (SDID) specification. The dashed gray vertical line at month -13 denotes that statement balance data before this time was used to construct the control group. The dashed gray vertical line at month 0 denotes August 2019 when the Quebec policy begins. Standard errors are calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021), with error bars showing 95% confidence intervals. This figure is calculated using data on the credit cards held by 22.4 million consumers in Canada, observed over 25 months.

Figure 5: Synthetic difference-in-differences estimates for effects of policy on A. revolving credit card debt, and (B) any credit card delinquency



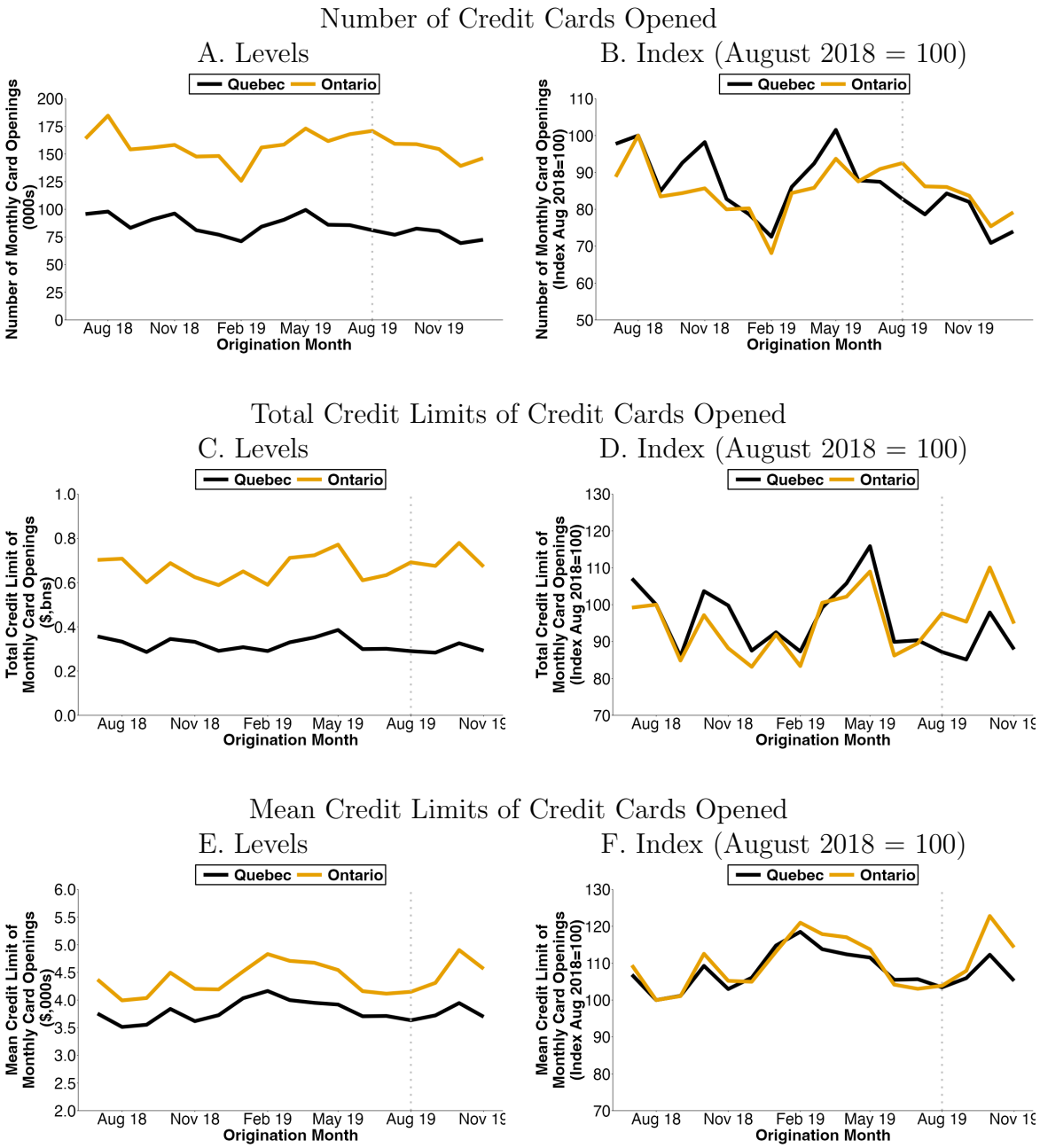
Notes: Data source is TransUnion. Estimates for the effect of the first phase of the Quebec policy requiring credit card minimum payments for existing cards to be at least 2% of statement balance. The outcome in Panel A is credit card revolving debt in $. The outcome in Panel B is any credit card delinquency (measured by 30 or more days past due), in percentage points. We plot the δ_τ estimates from our dynamic synthetic difference-in-differences (SDID) specification. The dashed gray vertical line at month -13 denotes that statement balance data before this time was used to construct the control group. The dashed gray vertical line at month 0 denotes August 2019 when the Quebec policy begins. Standard errors are calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021), with error bars showing 95% confidence intervals. This figure is calculated using data on the credit cards held by 22.4 million consumers in Canada, observed over 25 months.

Figure 6: Synthetic difference-in-differences estimates for effects of policy on A. credit card statement balance, and (B) credit card limits



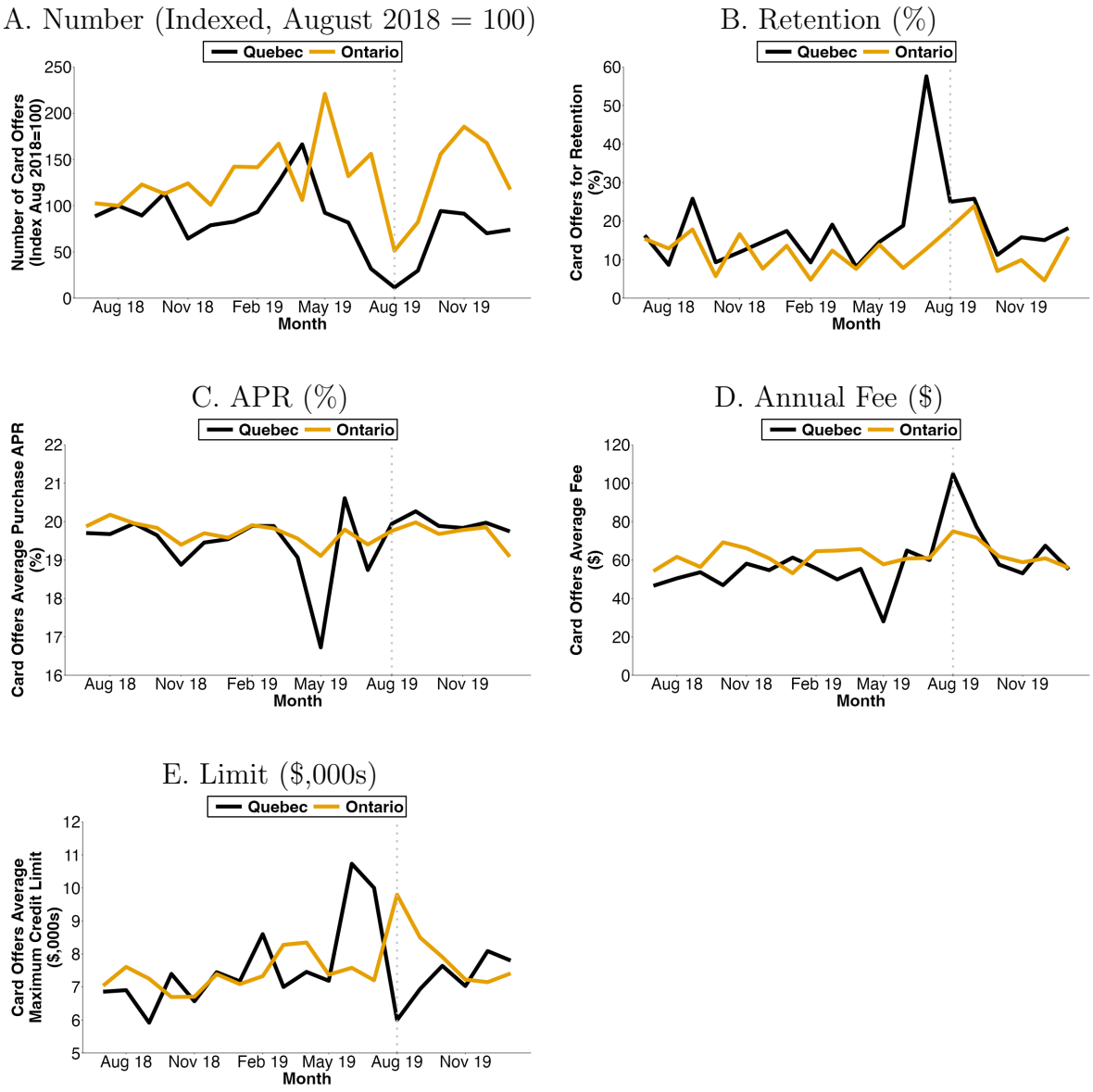
Notes: Data source is TransUnion. Estimates for the effect of the first phase of the Quebec policy requiring credit card minimum payments for existing cards to be at least 2% of statement balance. The outcome in Panel A is credit card statement balance in $. The outcome in Panel B is credit card limit in $. We plot the δ_τ estimates from our dynamic synthetic difference-in-differences (SDID) specification. The dashed gray vertical line at month -13 denotes that statement balance data before this time was used to construct the control group. The dashed gray vertical line at month 0 denotes August 2019 when the Quebec policy begins. Standard errors are calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021), with error bars showing 95% confidence intervals. This figure is calculated using data on the credit cards held by 22.4 million consumers in Canada, observed over 25 months.

Figure 7: New credit card openings, by month of opening



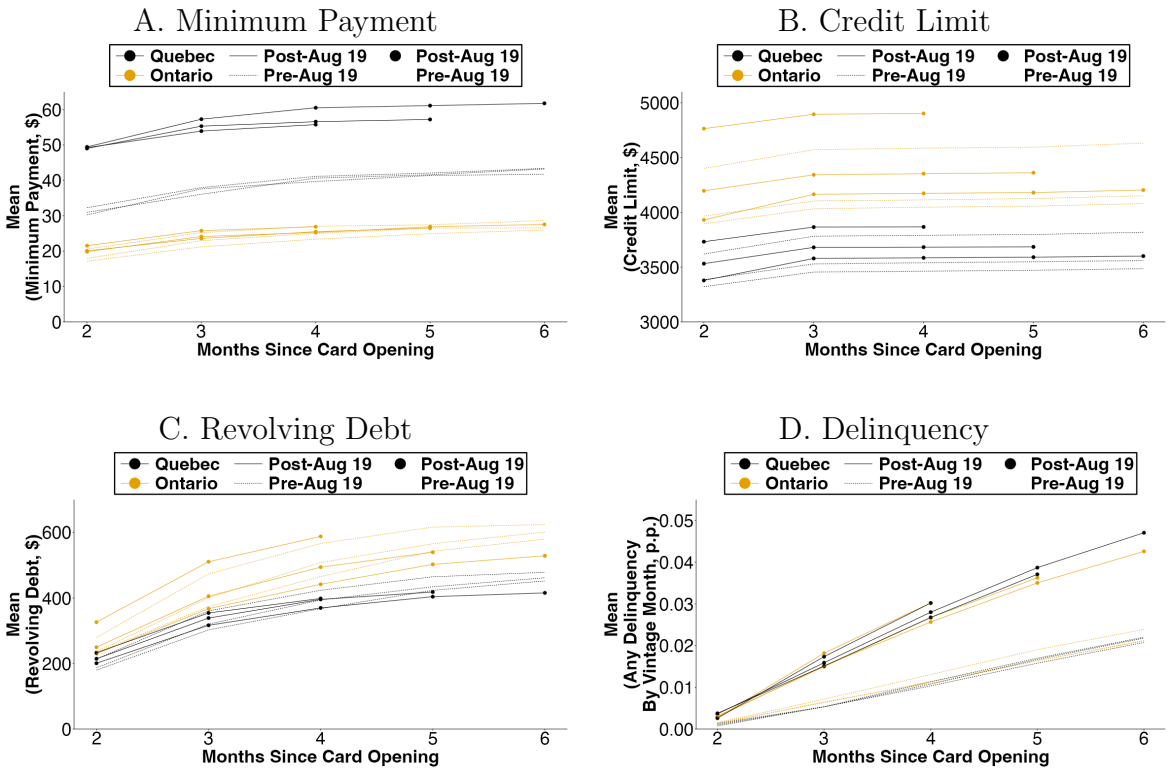
Notes: Data source is TransUnion. This figure summarizes the number of new credit cards opened separately in Quebec and Ontario, each month from July 2018 to November 2018 (and December 2018 for Panels A and B). Panels C to F use credit limits as recorded three months after origination. Panel A shows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

Figure 8: Monthly mailed credit card offers



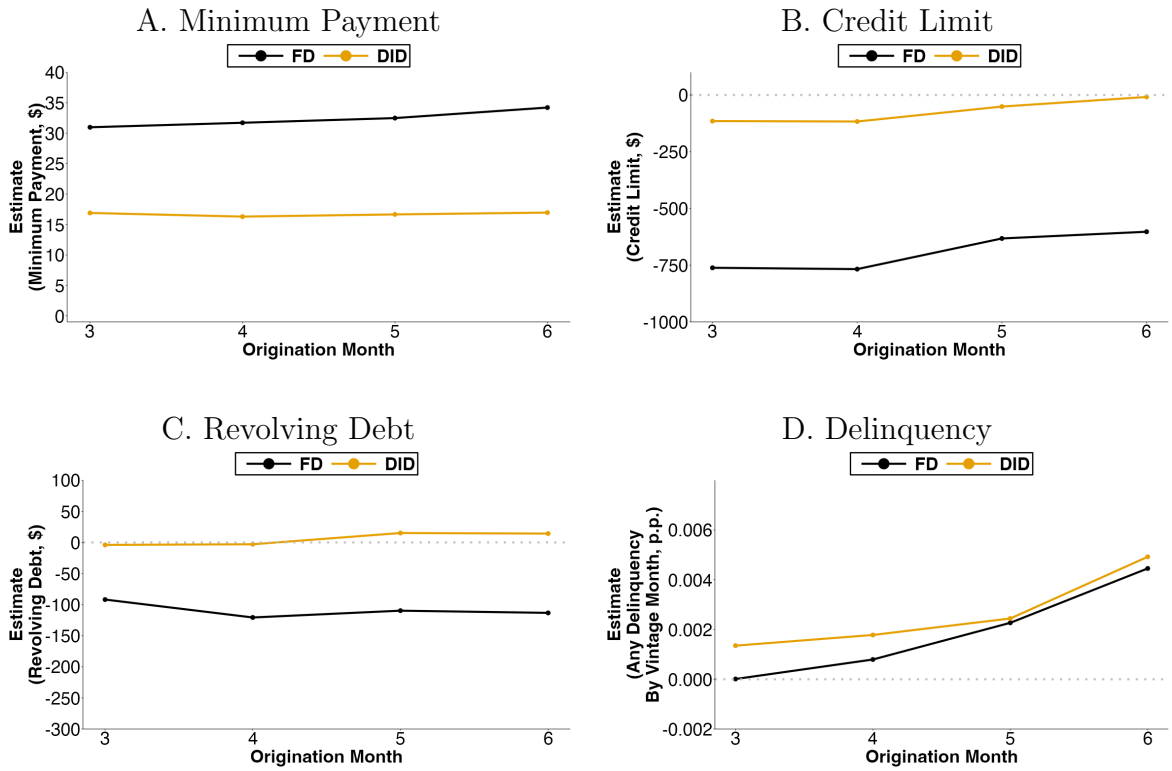
Notes: Data source is Mintel Comperemedia. This figure summarizes the number and characteristics of credit cards offers sent via mail in Quebec and Ontario, each month from July 2018 to January 2020. Panel A normalizes each province's series to 100 for the number of card offers mailed to consumers in the Mintel panel in August 2018. For consumers receiving offers: (i) Panel B shows the percentage of offers meant to retain an existing cardholder (e.g., to upgrade or renew an existing card); (ii) Panel C shows the average interest rate (APR) on new purchases listed on offers; (iii) Panel D shows the average annual fee listed on offers; (iv) Panel E shows the average maximum credit limit listed on offers.

Figure 9: New cards—unconditional means



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 denote card cohorts opened in Quebec in 2019, after the policy. Black dashed lines denote card cohorts opened in Quebec in 2018, before the policy. Yellow solid and dashed lines denote card cohorts opened in Ontario in 2019 and 2018, respectively. Panels A, B, C, and D, respectively, show unconditional means of minimum payments, credit limits, revolving debt, and delinquency, for each card cohort by number of months since card opening.

Figure 10: New cards—regression estimates



Notes: Data source is TransUnion. The x-axes show months since origination. The y-axes show regression estimates. The black lines show regression estimates of δ_v^{FD} from Equation 4. These are the coefficients on the interaction between indicators for months since card opening and an indicator for card cohorts opened in Quebec. FD estimates use data from cohorts of new cards opened in Quebec or Ontario during August, September, and October of 2019. The FD regression includes controls for months since card opening, cohort year-month, and calendar year-month. The orange lines show regression estimates of δ_v^{DID} from Equation 5. These are the coefficients on the interaction between indicators for months since card opening and indicators for card cohorts opened from August 2019 onward and in Quebec. DID estimates use data from cohorts of new cards opened in Quebec or Ontario during August, September, and October of 2018 and 2019. The FD regression also includes controls for months since card opening, province of card opening, cohort year-month, and calendar year-month, as well as allowing card cohorts opened from August 2019 to vary differentially in months since origination relative to cohorts opened before August 2019, and also allowing card cohorts opened in Quebec to vary differentially in months since origination relative to cohorts opened in Ontario.

Table 1: Lender minimum payment formulae in Quebec and the rest of Canada

A. Existing Cards

Group	Lender	July 2019		August 2019	
		Non-Quebec	Quebec	Non-Quebec	Quebec
2.0%	A	\$10 + interest + fees			max {2.0% statement balance, \$10}
	B	\$10 + interest + fees			max {2.0% statement balance, \$10}
2.5%	C	\$10 + interest + fees			max {2.5% statement balance, \$10}
	D	\$10 + interest + fees			max {2.5% statement balance, \$10}
	E	\$10 + interest + fees			max {2.5% statement balance, \$10}
3.0%	F	\$10 + interest + fees			max {3.0% statement balance, \$10}
	G	max {1.0% statement balance, \$10}			max {3.0% statement balance, \$10}
Z	H	max {2.0% statement balance, \$10}			max {2.0% statement balance, \$10}
	I	max {2.0% statement balance, \$10}			max {2.0% statement balance, \$10}
	J	max {2.5% statement balance, \$10}			max {2.5% statement balance, \$10}
	K	max {3.0% statement balance, \$10}			max {3.0% statement balance, \$10}

B. New Cards

Group	Lender	July 2019		August 2019	
		Non-Quebec	Quebec	Non-Quebec	Quebec
2.0%	A	\$10 + interest + fees			max {5.0% statement balance, \$10}
	B	\$10 + interest + fees			
2.5%	C	\$10 + interest + fees			max {5.0% statement balance, \$10}
	D	\$10 + interest + fees			
	E	\$10 + interest + fees			
3.0%	F	\$10 + interest + fees			max {5.0% statement balance, \$10}
	G	max {1.0% statement balance, \$10}			
Z	H	max {2.0% statement balance, \$10}			max {5.0% statement balance, \$10}
	I	max {2.0% statement balance, \$10}			
	J	max {2.5% statement balance, \$10}			
	K	max {3.0% statement balance, \$10}			

Notes: Panel A shows lenders' minimum payment formulae in July and August 2019, for existing cards opened before August 2019. Panel B shows lenders' minimum payment formulae for new cards opened in July and August 2019. Minimum payment formulae are the same in non-Quebec Canadian provinces as in the Province of Ontario.

Table 2: Weights for each province in Synthetic Difference-in-Differences (SDID)

Province	**Province Weight**
Quebec	1.0000
Alberta	0.1102
British Columbia	0.1200
Manitoba	0.1210
New Brunswick	0.1519
Newfoundland and Labrador	0.1160
Nova Scotia	0.1499
Saskatchewan	0.0990
Ontario	0.1319

Table 3: Effects of Quebec Policy After One Month (September 2019)

Outcome	Estimate (S.E.)	Baseline Mean
Minimum Payment	17.73	116.77
	(1.61)	
Revolving Debt	-8.21	1362.18
	(32.79)	
Any Delinquency	0.2481	2.7294
	(0.0887)	
Credit Limit	255.12	12430.59
	(123.23)	
Statement Balance	17.8	3234.56
	(36.31)	

Notes: Data source is TransUnion. Estimates for the effect of the first phase of the Quebec policy requiring credit card minimum payments for existing cards to be at least 2% of statement balance. This table shows the effects one month after the policy began, the δ_1 estimates from our dynamic synthetic difference-in-differences (SDID) specification. Each outcome is from a separate SDID regression. Standard errors are calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021), with error bars showing 95% confidence intervals. This table is calculated using data on the credit cards held by 22.4 million consumers in Canada, observed over 25 months. The baseline means are calculated fo Quebec during the period eighteen to thirteen months before the policy, using the SDID's time-weights as in Clarke et al. (2024).

Table 4: Effects of Quebec Policy After Six Months (February 2020)

Outcome	Estimate (S.E.)	Baseline Mean
Minimum Payment	15.45	116.77
	(1.51)	
Revolving Debt	-152.52	1362.18
	(58.76)	
Any Delinquency	-0.0197	2.7294
	(0.0736)	
Credit Limit	-189.31	12430.59
	(97.83)	
Statement Balance	-81.65	3234.56
	(15.19)	

Notes: Data source is TransUnion. Estimates for the effect of the first phase of the Quebec policy requiring credit card minimum payments for existing cards to be at least 2% of statement balance. This table shows the effects six months after the policy began, the δ_6 estimates from our dynamic synthetic difference-in-differences (SDID) specification. Each outcome is from a separate SDID regression. Standard errors are calculated using the placebo variance estimation approach of Arkhangelsky et al. (2021), with error bars showing 95% confidence intervals. This table is calculated using data on the credit cards held by 22.4 million consumers in Canada, observed over 25 months. The baseline means are calculated fo Quebec during the period eighteen to thirteen months before the policy, using the SDID's time-weights as in Clarke et al. (2024).

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6 Appendix

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.

Both surveys ask "Over the last 12 months, on your (and your family's credit cards), what did you usually pay?" Table A1 reports results.

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 the 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 min. 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 on how much people typically pay on their outstanding balance. Households in the PCS report slightly higher full repayment, but minimum repayment is similar across 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 min. 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

The PCS also asks about the number of cards in the respondent's wallet. Figure A1 plots a histogram of the number of cards in the wallets of people living in Ontario and Quebec. The same share of respondents—approximately one-third—have two cards. Quebec residents are more likely to have only one card relative to Ontarians, while Ontarians are more likely to have three cards.

Figure A1: Number of cards in the wallet (2018)

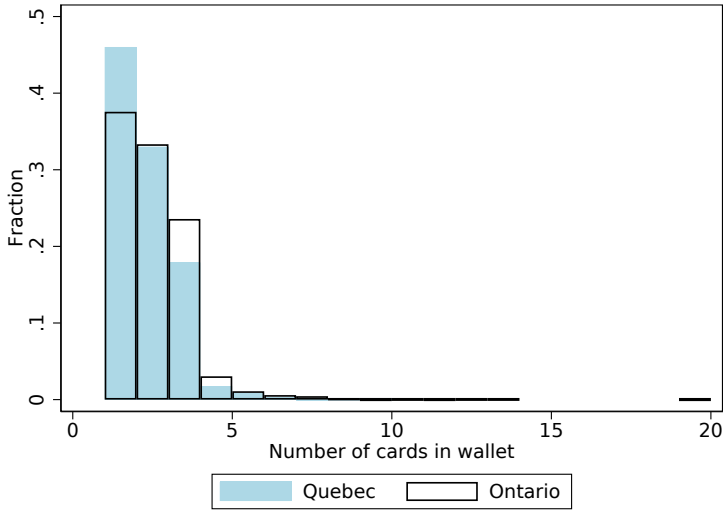
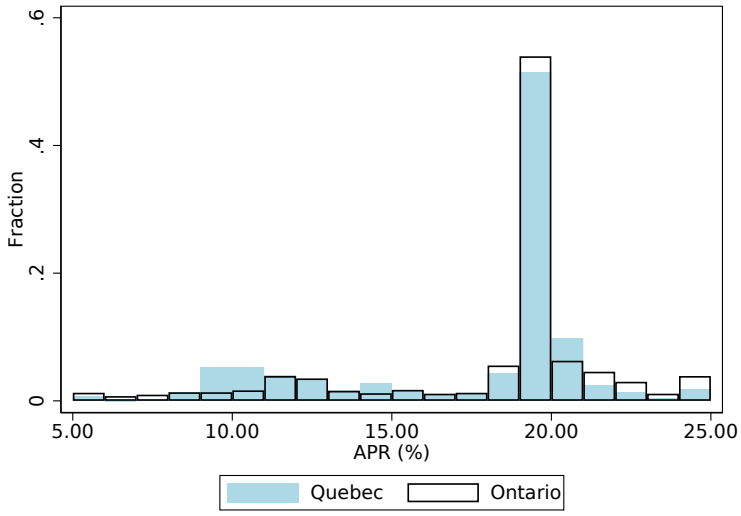
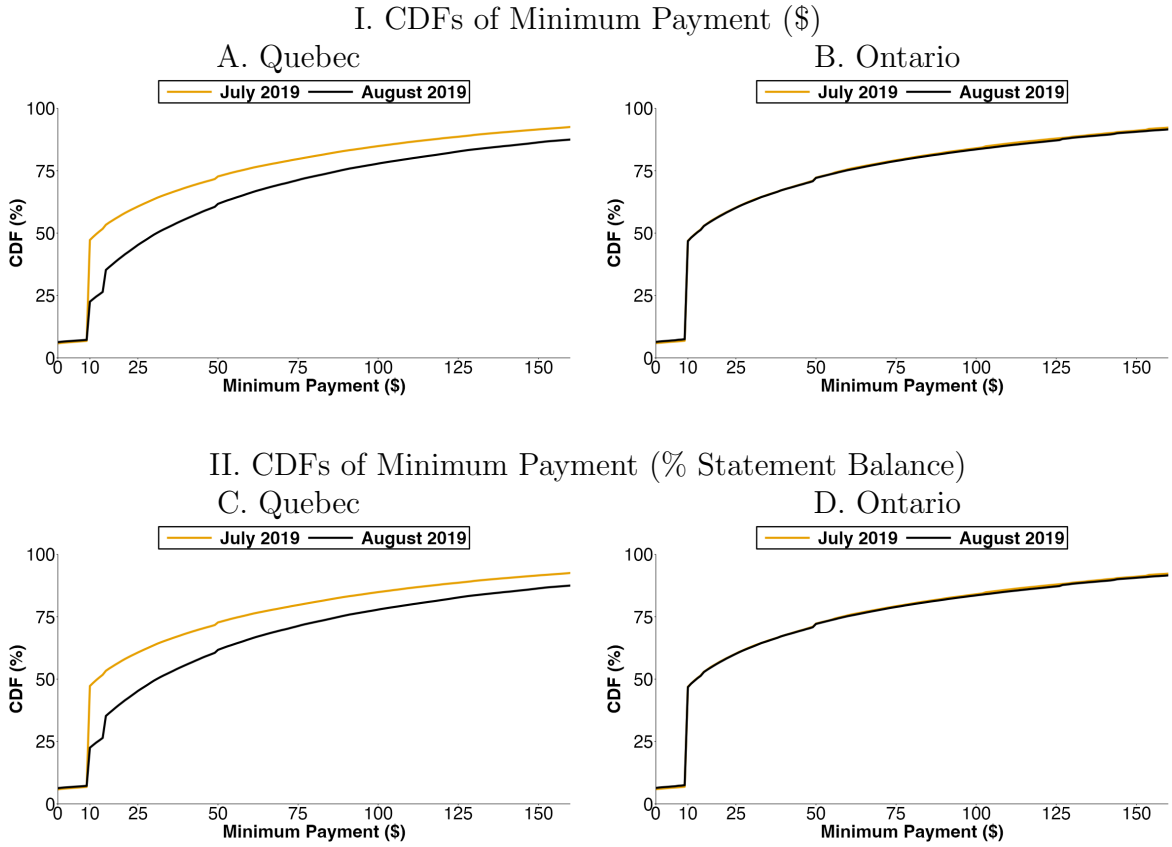


Figure A2: Interest rate dispersion (2018)



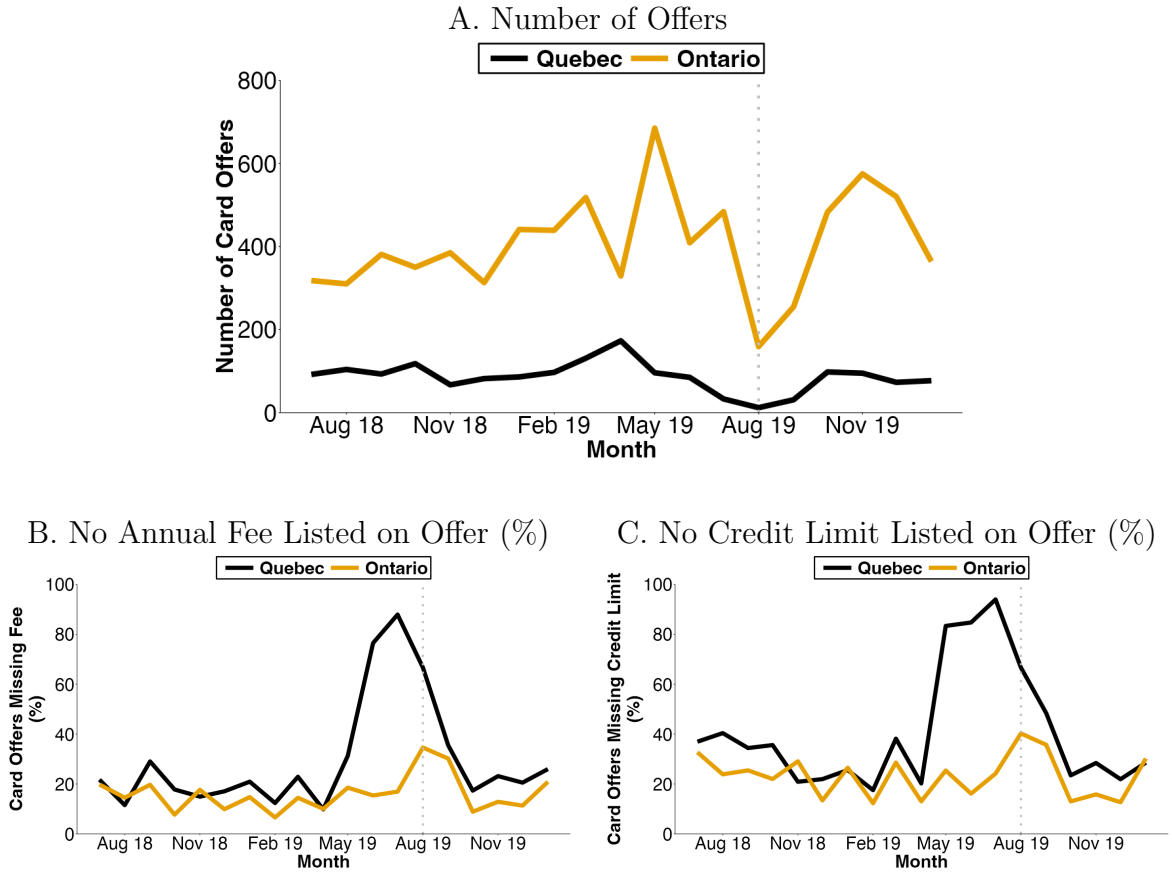
B Additional Results

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



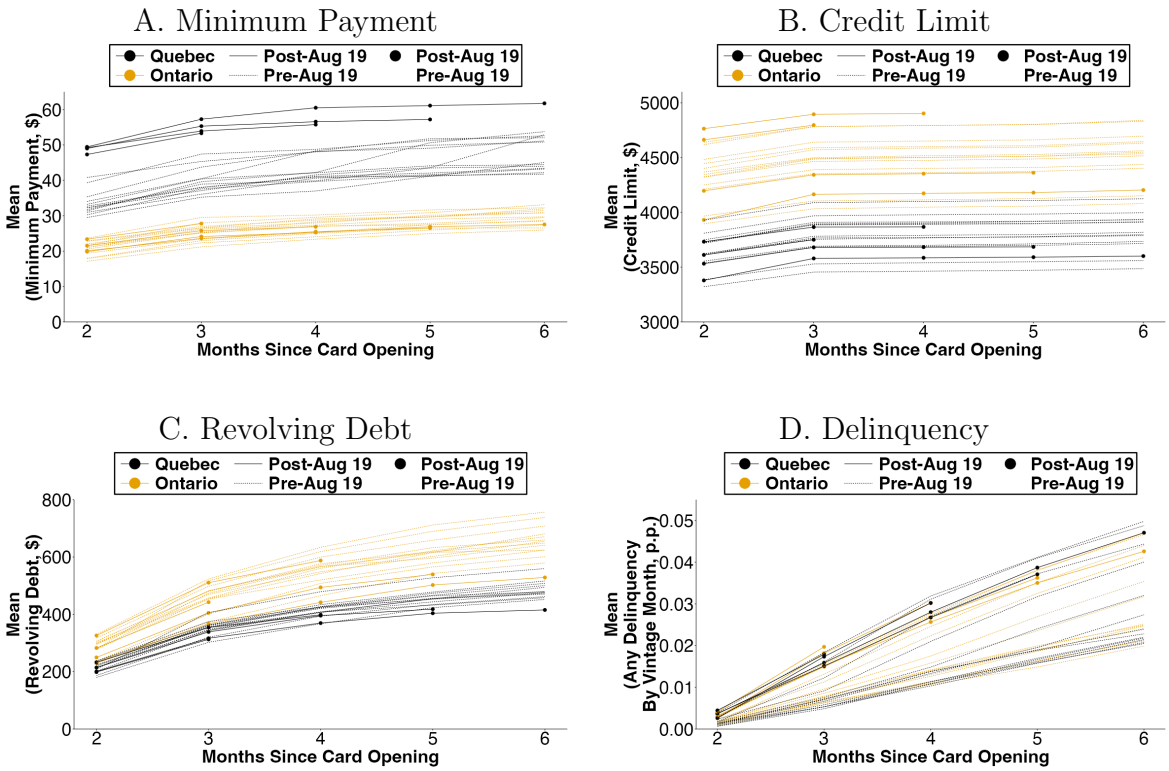
Notes: Data source is TransUnion. Includes all active cards open in Ontario matched to those in Quebec as of July 2019 and excludes observations with zero statement balances. In all panels, x-axes of CDFs are right-censored to ease presentation. The minimum payment amount is a combination of interest, fees, and capital repayment.

Figure B2: Additional details on monthly mailed credit card offers



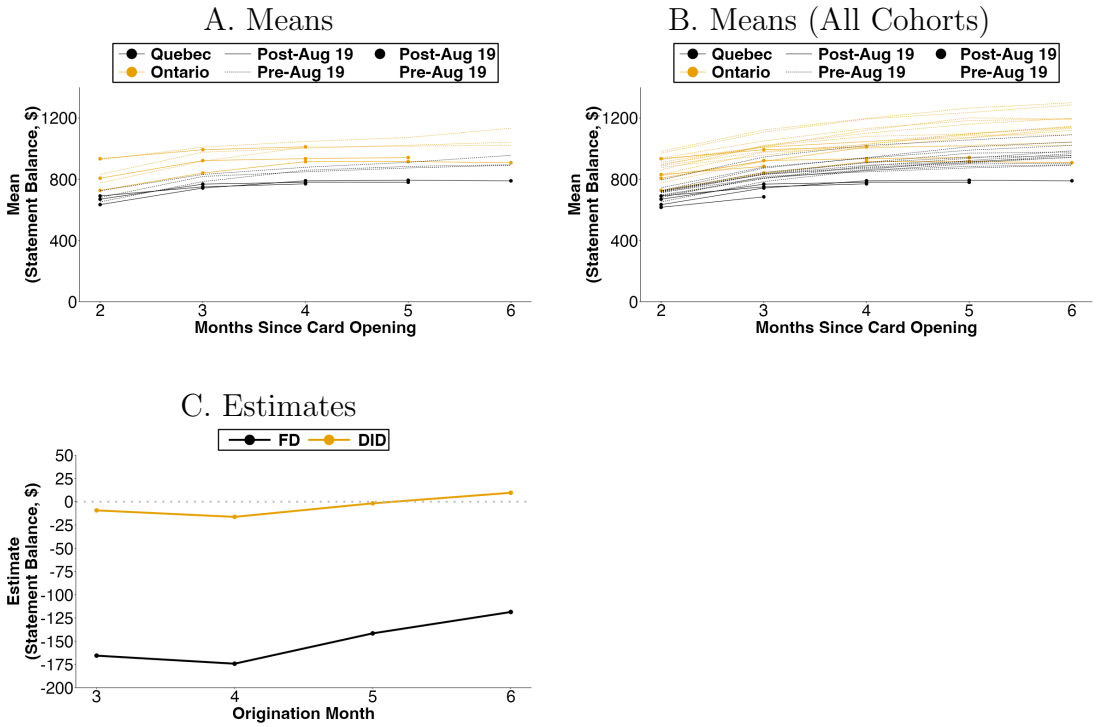
Notes: Data source is Mintel Comperemedia. This figure summarizes the number and characteristics of credit cards offers sent via mail in Quebec and Ontario, each month from July 2018 to January 2020. Panel A shows the number of credit card offers mailed to consumers in the Mintel panel each month. Panel B 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 C shows, for consumers receiving offers, the percentage where the offer does not list a credit limit.

Figure B3: New cards—unconditional means (all cohorts)



Notes: TransUnion data. This figure shows unconditional means for cohorts of new cards opened in Quebec or Ontario from July 2018 to November 2019. The x-axes are number of months since card opening. Black solid lines denote card cohorts opened in Quebec from August 2019, after the policy. Black dashed lines denote card cohorts opened in Quebec before August 2019, before the policy. Yellow solid and dashed lines denote card cohorts opened in Ontario from, and before, August 2019, respectively. Panels A, B, C, and D respectively show unconditional means of minimum payments, credit limits, revolving debt, and delinquency, for each card cohort by number of months since card opening.

Figure B4: New cards—unconditional means and regression estimates for statement balances



Notes: TransUnion data. Panels A and B show unconditional means of statement balances for cohorts of new cards opened in Quebec or Ontario. On the x-axes are number of months since card opening. Black solid lines denote card cohorts opened in Quebec starting in August 2019. Black dashed lines denote card cohorts opened in Quebec before August 2019. Yellow solid and dashed lines denote card cohorts opened in Ontario from and before August 2019, respectively. Panel A shows unconditional means for cohorts of new cards opened in Quebec or Ontario from July 2018 to November 2019. Panel B shows cohorts of new cards opened in Quebec or Ontario from July 2018 to November 2019. Panel C shows regression estimates: the x-axes show number of months since origination and the y-axes show regression estimates. The black lines show regression estimates of δ_v^{FD} from Equation 4. These are the coefficients on the interaction between indicators for number of months since card opening and an indicator for card cohorts opened in Quebec. FD estimates use data from cohorts of new cards opened in Quebec or Ontario during August, September, and October of 2019. The FD regression includes controls for months since card opening, cohort year-month, and calendar year-month. The orange lines show regression estimates of δ_v^{DID} from Equation 5. These are the coefficients on the interaction between indicators for months since card opening and indicators for card cohorts opened from August 2019 onward and in Quebec. DID estimates use data from cohorts of new cards opened in Quebec or Ontario during August, September, and October of 2018 and 2019. The FD regression also includes controls for number of months since card opening, province of card opening, cohort year-month, and calendar year-month, as well as allowing card cohorts opened from August 2019 to vary differentially in the number of months since origination relative to cohorts opened before August 2019, and also allow card cohorts opened in Quebec to vary differentially in number of months since origination relative to cohorts opened in Ontario.