Evaluating Credit Card Minimum Payment Restrictions

Jason Allen[1] Michael Boutros[2] Benedict Guttman-Kenney[3]

5th CEAR-RSI Household Finance Workshop
November 15, 2024

[1]University of Wisconsin [2]University of Toronto [3]Rice University

*The views expressed herein are those of the authors and do not necessarily reflect those of the Bank of Canada.

Motivation: Introduction

How can policymakers help households improve their financial health?

Motivation: Introduction

How can policymakers help households improve their financial health?

1. Nudges
    - Targeted at biases, steering actions, and reducing frictions.

Motivation: Introduction

How can policymakers help households improve their financial health?

1. Nudges
   - Targeted at biases, steering actions, and reducing frictions.
   - Limited efficacy in reducing household borrowing (Adams et al., 2022; Guttman-Kenney et al., 2022).

Motivation: Introduction

How can policymakers help households improve their financial health?

1. Nudges
   - Targeted at biases, steering actions, and reducing frictions.
   - Limited efficacy in reducing household borrowing (Adams et al., 2022; Guttman-Kenney et al., 2022).
2. Disclosure Regulation
   - E.g., “Schumer Box,” tackles biased beliefs or financial illiteracy.

Motivation: Introduction

How can policymakers help households improve their financial health?

1. Nudges
   - Targeted at biases, steering actions, and reducing frictions.
   - Limited efficacy in reducing household borrowing (Adams et al., 2022; Guttman-Kenney et al., 2022).

2. Disclosure Regulation
   - E.g., "Schumer Box," tackles biased beliefs or financial illiteracy.
   - Doesn't work in US (Agarwal et al., 2015; Keys and Wang, 2015), Mexico (Seria et al., 2017), or UK (Adams et al., 2022).

Motivation: Introduction

How can policymakers help households improve their financial health?

1. Nudges
   - Targeted at biases, steering actions, and reducing frictions.
   - Limited efficacy in reducing household borrowing (Adams et al., 2022; Guttman-Kenney et al., 2022).

2. Disclosure Regulation
   - E.g., "Schumer Box," tackles biased beliefs or financial illiteracy.
   - Doesn't work in US (Agarwal et al., 2015; Keys and Wang, 2015), Mexico (Seria et al., 2017), or UK (Adams et al., 2022).

Therefore, there is an increased **recognition** in behavioural & public economics nudges **are not enough** …

How can policymakers help households improve their financial health?

Therefore, there is an increased **recognition** in behavioural & public economics nudges **are not enough** & need to evaluate hard paternalism (e.g. Chater & Loewenstein, 2017, 2022; Laibson, 2020).

How can policymakers help households improve their financial health?

Therefore, there is an increased **recognition** in behavioural & public economics nudges **are not enough** & need to evaluate hard paternalism (e.g. Chater & Loewenstein, 2017, 2022; Laibson, 2020).

3. **Paternalism**: restricting consumer choice.

How can policymakers help households improve their financial health?

Therefore, there is an increased **recognition** in behavioural & public economics nudges **are not enough** & need to evaluate hard paternalism (e.g. Chater & Loewenstein, 2017, 2022; Laibson, 2020).

3. **Paternalism**: restricting consumer choice.
   - *"If nudges are unavailable or inadequate, consumer financial regulation must confront the tradeoff between the benefits of intervention to behavioral agents, and the costs to rational agents."* - John Campbell (2016 AEA)
   - Credit cards: anchoring vs. liquidity constraints (Keys and Jiang, 2019).

How can policymakers help households improve their financial health?

Therefore, there is an increased **recognition** in behavioural & public economics nudges **are not enough** & need to evaluate hard paternalism (e.g. Chater & Loewenstein, 2017, 2022; Laibson, 2020).

3. **Paternalism**: restricting consumer choice.
   - *"If nudges are unavailable or inadequate, consumer financial regulation must confront the tradeoff between the benefits of intervention to behavioral agents, and the costs to rational agents."* - John Campbell (2016 AEA)
   - Credit cards: anchoring vs. liquidity constraints (Keys and Jiang, 2019).

This Paper: Quantify the trade-offs of a hard paternalistic policy that imposes minimum credit card payments.

Motivation: Context

Setting: Canadian credit card market and minimum payments.

- In 2019, Quebec provincial government introduced paternalistic legislation to “prevent over-indebtedness.”
- New minimum credit card payments: restricting choices of how much households must pay each month to remain in good standing.
- Increasing minimum payment forces cardholders to revolve less debt.

Motivation: Context

Setting: Canadian credit card market and minimum payments.

- In 2019, Quebec provincial government introduced paternalistic legislation to “prevent over-indebtedness.”
- New minimum credit card payments: restricting choices of how much households must pay each month to remain in good standing.
- Increasing minimum payment forces cardholders to revolve less debt.

Question: What are the costs and benefits of this paternalistic policy?

Motivation: Analysis of Trade-Off

Trade-off: ambiguous effect of increasing minimum credit card payments.

Motivation: Analysis of Trade-Off

Trade-off: ambiguous effect of increasing minimum credit card payments.

Benefit: reduction in credit card debt.

Motivation: Analysis of Trade-Off

Trade-off: ambiguous effect of increasing minimum credit card payments.

Benefit: reduction in credit card debt.

- Increases disposable income via reduced interest payments.
- Increases financial stability by improving household balance sheet health.

Motivation: Analysis of Trade-Off

Trade-off: ambiguous effect of increasing minimum credit card payments.

Benefit: reduction in credit card debt.

- Increases disposable income via reduced interest payments.
- Increases financial stability by improving household balance sheet health.

Cost: increase in delinquency.

- Increases households bound by liquidity constraints.

Motivation: Analysis of Trade-Off

Trade-off: ambiguous effect of increasing minimum credit card payments.

Benefit: reduction in credit card debt.

- Increases disposable income via reduced interest payments.
- Increases financial stability by improving household balance sheet health.

Cost: increase in delinquency.

- Increases households bound by liquidity constraints.

Cost: reduced supply of credit card debt.

- Decreases lender profit via reduced interest payments.

Preview of Main Results

Natural Experiment: Quebec consumer protection bureau unilaterally raised minimum credit card payments to (at least) 2.0% of balance in August 2019.

Preview of Main Results

Natural Experiment: Quebec consumer protection bureau unilaterally raised minimum credit card payments to (at least) 2.0% of balance in August 2019.

Methodology: differences-in-differences between Quebec and Ontario.

- First stage: 46% increase in average minimum payment ($23 in August 2019).

Preview of Main Results

Natural Experiment: Quebec consumer protection bureau unilaterally raised minimum credit card payments to (at least) 2.0% of balance in August 2019.

Methodology: differences-in-differences between Quebec and Ontario.

- First stage: 46% increase in average minimum payment ($23 in August 2019).

Benefit: reduction in credit card debt.

- 3.4% decrease in revolving credit card debt after six months ($64 decrease).
- Overall effect driven cards with revolving debt ($109 decrease).

Preview of Main Results

Natural Experiment: Quebec consumer protection bureau unilaterally raised minimum credit card payments to (at least) 2.0% of balance in August 2019.

Methodology: differences-in-differences between Quebec and Ontario.

- First stage: 46% increase in average minimum payment ($23 in August 2019).

Benefit: reduction in credit card debt.

- 3.4% decrease in revolving credit card debt after six months ($64 decrease).
- Overall effect driven cards with revolving debt ($109 decrease).

Cost: increase in delinquency.

- 10% increase in delinquency rates after six months (0.105 pp).

Preview of Main Results

Natural Experiment: Quebec consumer protection bureau unilaterally raised minimum credit card payments to (at least) 2.0% of balance in August 2019.

Methodology: differences-in-differences between Quebec and Ontario.

- First stage: 46% increase in average minimum payment ($23 in August 2019).

Benefit: reduction in credit card debt.

- 3.4% decrease in revolving credit card debt after six months ($64 decrease).
- Overall effect driven cards with revolving debt ($109 decrease).

Cost: increase in delinquency.

- 10% increase in delinquency rates after six months (0.105 pp).

Cost: reduced supply of credit card debt (preliminary).

- Evidence of relatively fewer new credit cards and lower credit limits in QC.

2. Quebec Policies

Quebec Policy Change: Bill 134

No credit card minimum payment requirements:

- Pre-August 2019: Anywhere in Canada.
- Post-August 2019: Outside Quebec.

Quebec Policy Change: Bill 134

No credit card minimum payment requirements:

- Pre-August 2019: Anywhere in Canada.
- Post-August 2019: Outside Quebec.

Quebec *Office de la protection du consommateur* introduced credit card minimum payment policies from August 2019:

- *"These changes are part of the measures adopted by the government **to prevent indebtedness**."*
- *"**It is advantageous to pay the balance of your credit card each month**, because no credit charges are then applicable."*

Quebec Policy Change: Bill 134

"The amounts requested by credit card issuers as a minimum payment have decreased significantly since the late 1980s. Indeed, the percentage requested as a minimum payment has decreased from 5% to 2%. This practice has the effect of ***considerably extending the period during which the consumer who pays only the minimum amount will have to repay the amount owed and of increasing the amount of credit charges*** *that will have to be paid to pay the balance in full."*

- Lise Thériault, Quebec Liberal Party

"We find it good that we are increasing, there, gradually to 5%, but ***we were afraid of the price shock that it could have on the most vulnerable consumers****."*

- Catherine Fournier, Parti Québécois

Quebec Policy Change: Bill 134

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%?

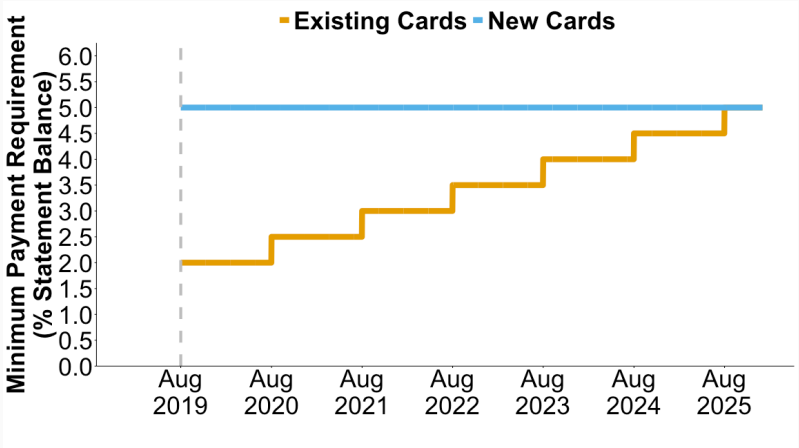
- They may do so if the contract already provided for that possibility.
- They may not do so if they amended the contract so as to charge more than 2% without your consent.

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.

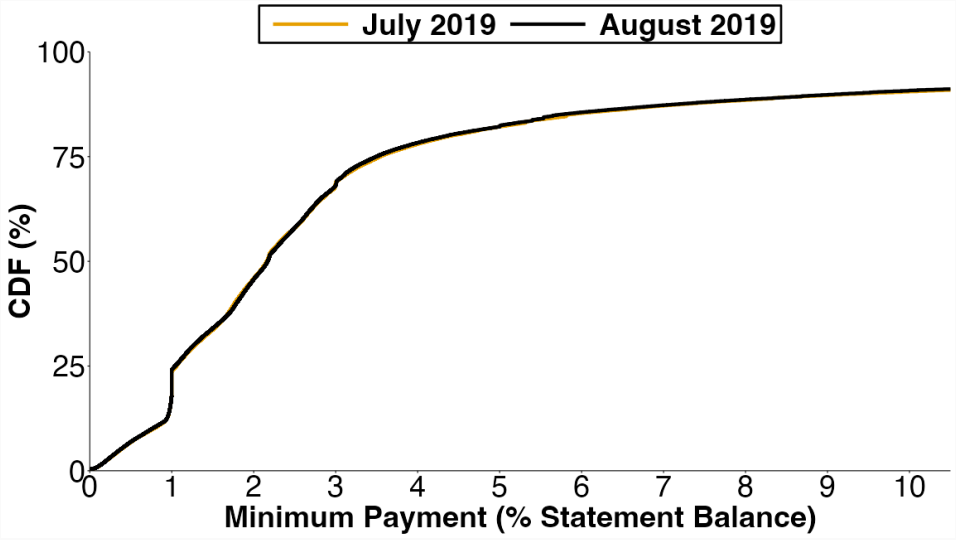
If the credit card issuer charges you a percentage that is higher than what is provided for in the contract or by the Act, contact the Office de la protection du consommateur.

Quebec Policy Change: Bill 134

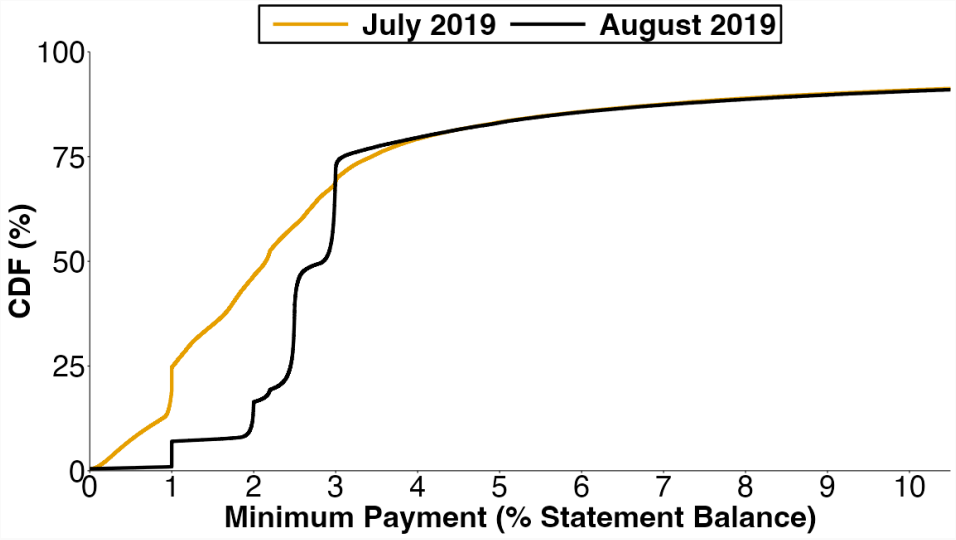


- Begin with 2.0% floor for minimum payments in 2019.
- By August 2025, all Quebec credit cards have at least 5% minimum payment.

Implementation of Policy Change (Control: Ontario)



Implementation of Policy Change (Treatment: Quebec)



Implementation of Policy Change

Group	Lender	July 2019		August 2019	
		Ontario	Quebec	Ontario	Quebec
2.0%	A	$10 + interest + fees			max {2.0% statement balance, $10}
	B	$10 + interest + fees			max {2.0% statement balance, $10}

Implementation of Policy Change

Group	Lender	July 2019		August 2019	
		Ontario	Quebec	Ontario	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}

Implementation of Policy Change

Group	Lender	July 2019		August 2019	
		Ontario	Quebec	Ontario	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}

Implementation of Policy Change

Group	Lender	July 2019		August 2019	
		Ontario	Quebec	Ontario	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}

3. Reduced Form Methodology

Data

1. Consumer credit reporting data:
   - Month-loan level data from 2012 – present of all Canadians with credit file.
   - Fields include statement balances, payments due, payments made, arrears status, card issuer, age, location, and credit score.

Data

1. Consumer credit reporting data:
   - Month-loan level data from 2012 – present of all Canadians with credit file.
   - Fields include statement balances, payments due, payments made, arrears status, card issuer, age, location, and credit score.
2. Mintel data:
   - Monthly panel from July 2018 to January 2020 of nearly 8,000 Canadian households, report all credit card offers they receive by mail/email.
   - Includes lender identity, contract terms, and demographics of panelist.
   - In the U.S., Mintel data has been used to study supply of credit (Han et al. 2018; Grodzicki, 2022; Ru and Schoar, 2020; and Honka et al., 2017).

Sample Selection: Existing Cards

- Retain data on cards for eleven lenders who operate in both Quebec and Ontario. Exclude one larger lender that operates only in Quebec.
- Lenders represent 64% of Quebec card balances and 84% of Ontario.

Sample Selection: Existing Cards

- Retain data on cards for eleven lenders who operate in both Quebec and Ontario. Exclude one larger lender that operates only in Quebec.
- Lenders represent 64% of Quebec card balances and 84% of Ontario.
- Exclude cards that are closed, in persistent severe arrears, or inactive (i.e. persistently have zero statement balances and repayments) up to July 2019.

Sample Selection: Existing Cards

- Retain data on cards for eleven lenders who operate in both Quebec and Ontario. Exclude one larger lender that operates only in Quebec.
- Lenders represent 64% of Quebec card balances and 84% of Ontario.
- Exclude cards that are closed, in persistent severe arrears, or inactive (i.e. persistently have zero statement balances and repayments) up to July 2019.
- To account for differences across provinces in income, employment, and spending, match Quebec sample to constructed Ontario sample using:
  - the combination of the same lender and BIN,
  - an indicator for whether a consumer is revolver, and
  - matching on covariates within this combination.
- Matched sample: 69 million observations from 5.3 million cards.

Summary Statistics: Matched Sample

	Quebec		Ontario	
Outcome	Before	After	Before	After
Minimum Payment ($)	49.10	73.04	49.37	51.73
Minimum Payment (%)	5.45	5.98	5.69	5.61
Revolving Debt ($)	1,875	1,900	1,861	1,931
Delinquency (%)	0.92	1.65	0.97	1.66
Active (%)	100	98.64	100	98.63
Credit Limit ($)	8,953	9,183	8,946	9,240
Statement Balance ($)	2,746	2,771	2,738	2,825
Utilization (%)	36.82	36.07	36.65	36.17
Spending ($)	1,072	1,079	1,118	1,149
Repayment ($)	1,040	1,090	1,088	1,147

Regression Framework

- Use DiD identification strategy to estimate causal effects of policy change:

$$y_{i,t} = \sum_{\tau \neq \text{July 2019}} \delta_\tau \Big(D_\tau \times QUEBEC_i \Big) + \gamma_i + \gamma_t + \varepsilon_{i,t}. \tag{1}$$

- One observation per card i in each calendar year-month t, includes card and time fixed effects.

Regression Framework

- Use DiD identification strategy to estimate causal effects of policy change:

$$y_{i,t} = \sum_{\tau \neq \text{July 2019}} \delta_\tau \Big(D_\tau \times QUEBEC_i \Big) + \gamma_i + \gamma_t + \varepsilon_{i,t}. \tag{1}$$

- One observation per card i in each calendar year-month t, includes card and time fixed effects.

- Indicator $QUEBEC_i$ if card is opened in Quebec in July 2019. Omitted category is the month preceding the policy's introduction, $\tau =$ July 2019.

Regression Framework

- Use DiD identification strategy to estimate causal effects of policy change:

$$y_{i,t} = \sum_{\tau \neq \text{July 2019}} \delta_\tau \Big(D_\tau \times QUEBEC_i \Big) + \gamma_i + \gamma_t + \varepsilon_{i,t}. \tag{1}$$

- One observation per card i in each calendar year-month t, includes card and time fixed effects.

- Indicator $QUEBEC_i$ if card is opened in Quebec in July 2019. Omitted category is the month preceding the policy's introduction, $\tau =$ July 2019.

- δ_τ are the dynamic estimated average treatment effects on the treated: $\tau < 0$ checks for pre-trends, $\tau \geq 0$ shows the effects of the policy over time.

Regression Framework

- Use DiD identification strategy to estimate causal effects of policy change:

$$y_{i,t} = \sum_{\tau \neq \text{July 2019}} \delta_\tau \Big(D_\tau \times QUEBEC_i \Big) + \gamma_i + \gamma_t + \varepsilon_{i,t}. \tag{1}$$

- One observation per card i in each calendar year-month t, includes card and time fixed effects.

- Indicator $QUEBEC_i$ if card is opened in Quebec in July 2019. Omitted category is the month preceding the policy's introduction, $\tau =$ July 2019.

- δ_τ are the dynamic estimated average treatment effects on the treated: $\tau < 0$ checks for pre-trends, $\tau \geq 0$ shows the effects of the policy over time.

- Estimate using OLS with SE clustered at the consumer-level to allow for correlation across cards held by the same consumer over time.

Main Outcome Variables

1. Minimum Payment
    - Observed in credit reporting data as schedule payment.
    - Inclusive of interest and fees.

Main Outcome Variables

1. Minimum Payment
   - Observed in credit reporting data as schedule payment.
   - Inclusive of interest and fees.

2. Revolving Debt
   - Construct the amount of credit card debt remaining after subtracting actual payments $p_{i,t}$ from the previous month's statement balance $b_{i,t-1}$.

$$d_{i,t} \equiv \begin{cases} b_{i,t-1} - p_{i,t} & \text{if } b_{i,t} - p_{i,t} \geq 0 \\ 0 & \text{otherwise} \end{cases} \tag{2}$$

Main Outcome Variables

1. Minimum Payment
   - Observed in credit reporting data as schedule payment.
   - Inclusive of interest and fees.

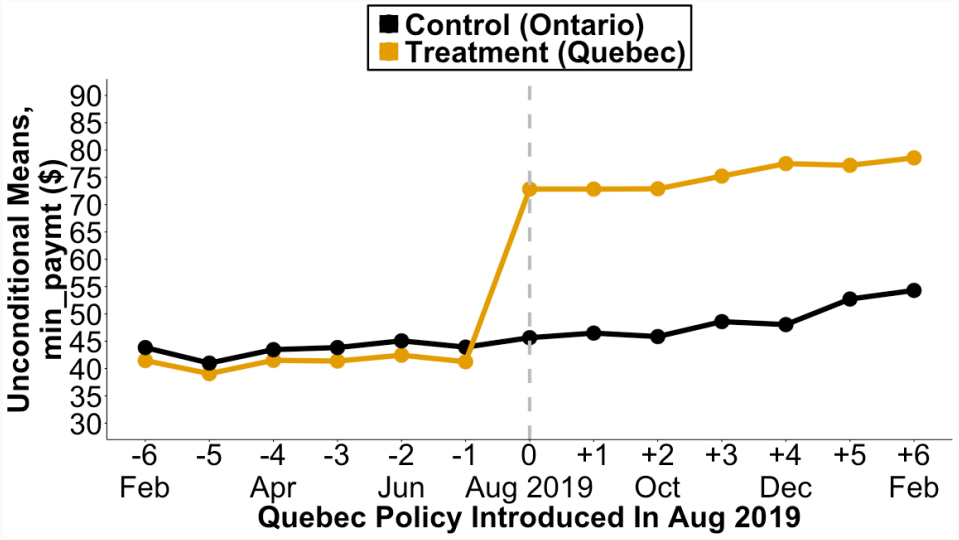
2. Revolving Debt
   - Construct the amount of credit card debt remaining after subtracting actual payments $p_{i,t}$ from the previous month's statement balance $b_{i,t-1}$.

$$d_{i,t} \equiv \begin{cases} b_{i,t-1} - p_{i,t} & \text{if } b_{i,t} - p_{i,t} \geq 0 \\ 0 & \text{otherwise} \end{cases} \tag{2}$$

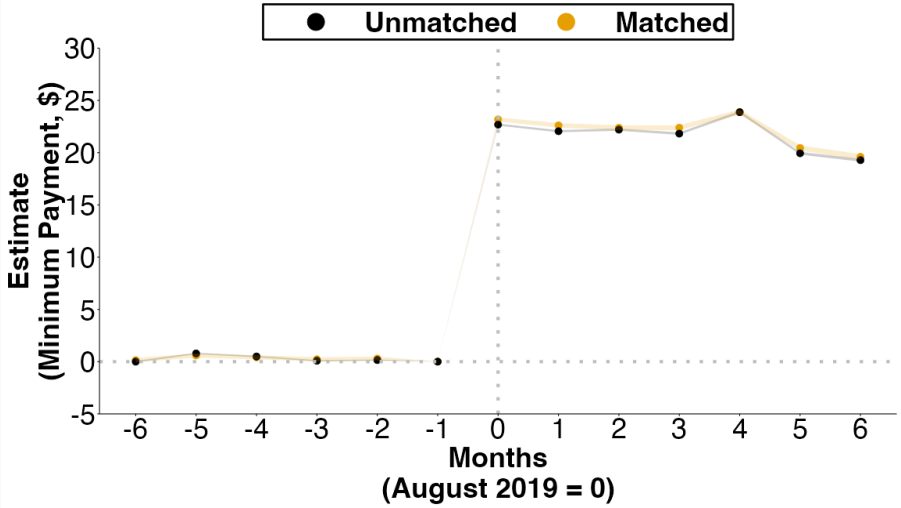
3. Delinquency
   - Measured as any missed payment recorded in credit report (i.e., minimum payment not made and 30 days or more after statement due date).

Results on Existing Cards

Results: Minimum Payment

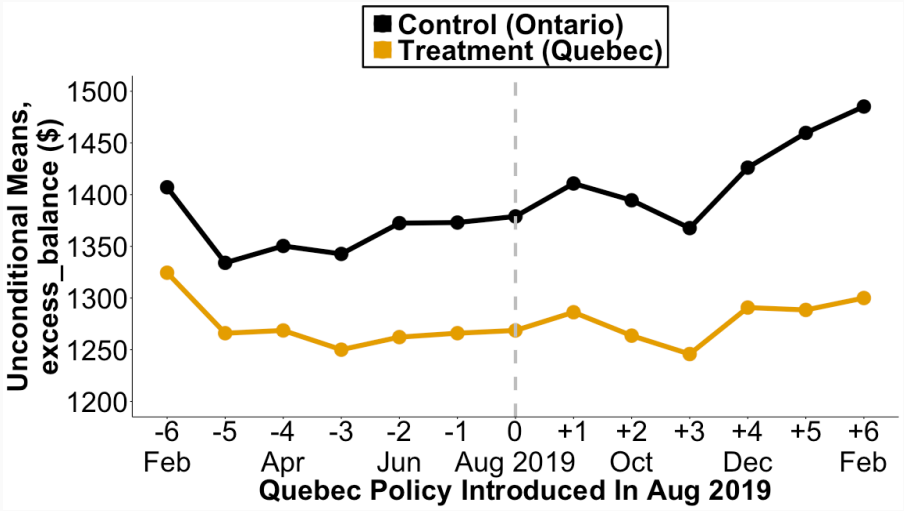


Results: Minimum Payment

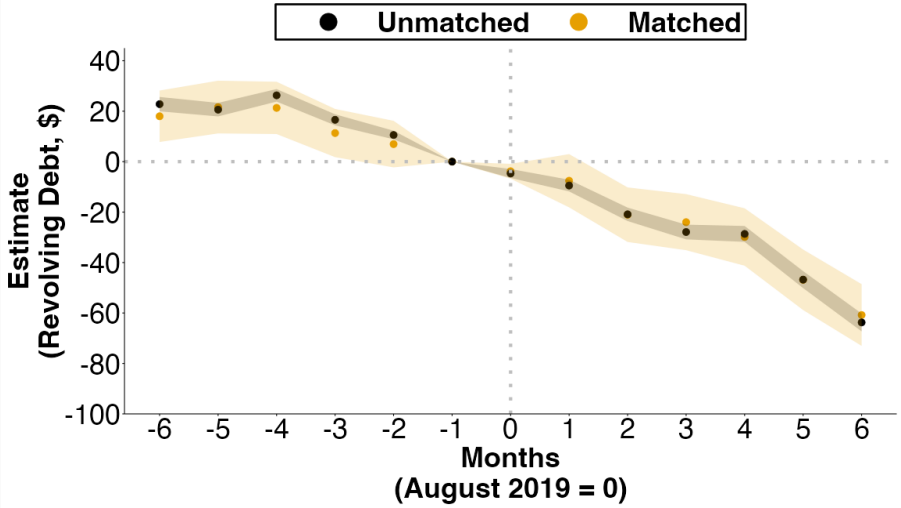


- $23 increase in minimum payment in month of policy change (46% increase).

Results: Revolving Debt (Excess Balance ≡ Balance − Payment)

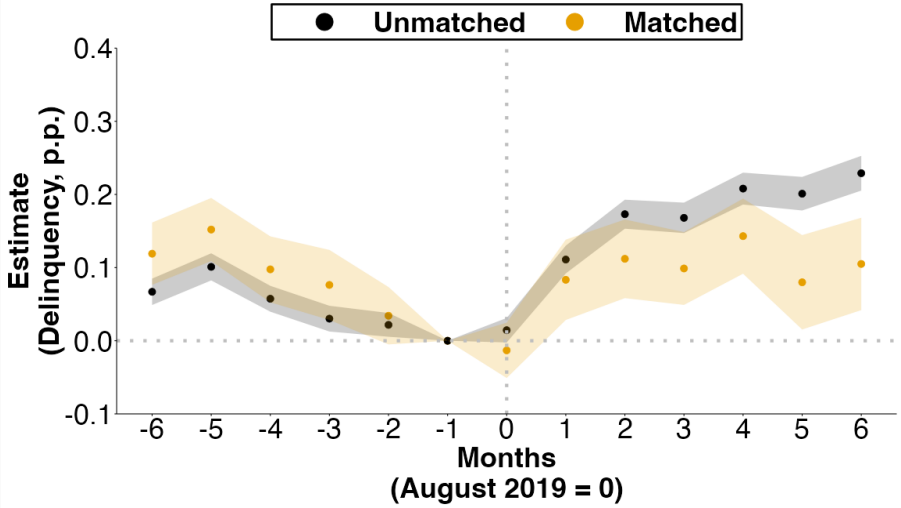


Results: Revolving Debt (Excess Balance ≡ Balance − Payment)



- $64 decrease in revolving debt after six months (3.4%).

Results: Delinquency



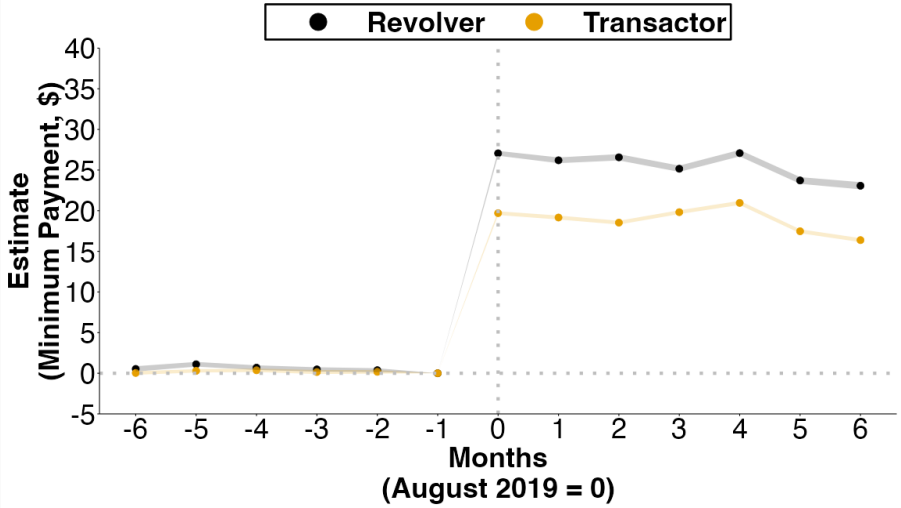
- 0.105 pp increase in delinquency rate after six months (10%).

Subsample Analysis: Revolvers vs. Transactors

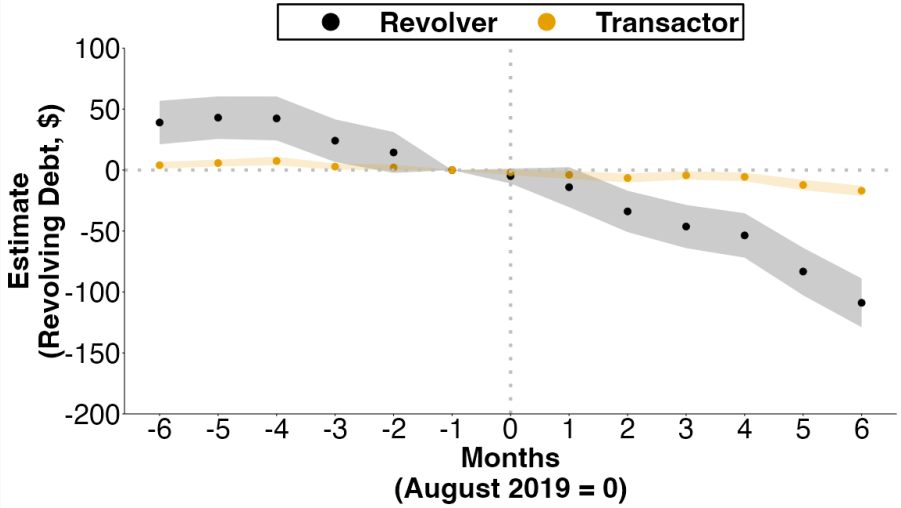
Revolver: pays less than full statement balance in majority of observed periods.

	Revolver		Transactor	
Outcome	Quebec	Ontario	Quebec	Ontario
Minimum Payment ($)	86.94	88.02	15.56	16.10
Minimum Payment (%)	4.25	4.36	6.57	6.74
Revolving Debt ($)	3,880.95	3,884.46	84.84	96.09
Delinquency (%)	2.04	2.31	0.08	0.10
Active (%)	100	100	100	100
Credit Limit ($)	8,046.13	8,055.18	9,937.22	9,937.95
Statement Balance ($)	4,472.21	4,497.69	1,287.48	1,282.07
Utilization (%)	60.85	61.08	15.27	15.30
Spending ($)	668.49	698.77	1,550.80	1,586.71
Repayment ($)	655.81	671.40	1,589.99	1,598.66

Results: Minimum Payment for Revolvers vs. Transactors



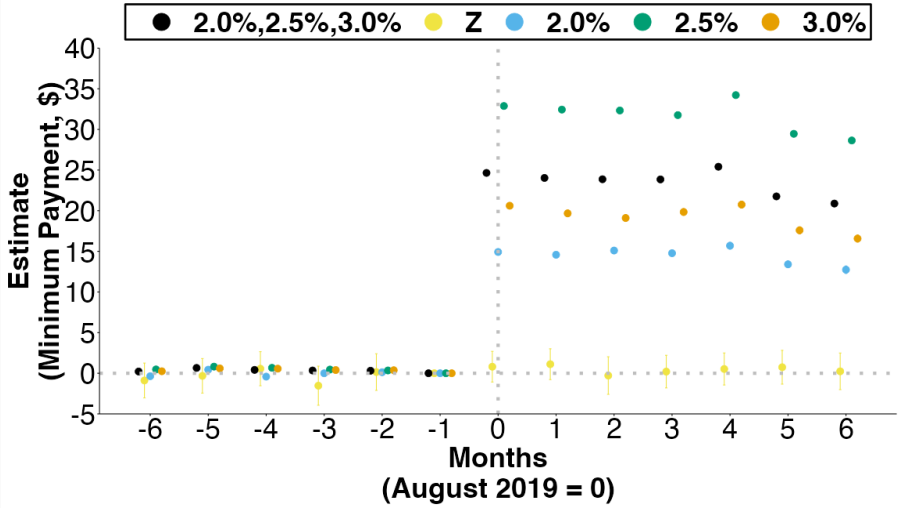
Results: Excess Balance for Revolvers vs. Transactors



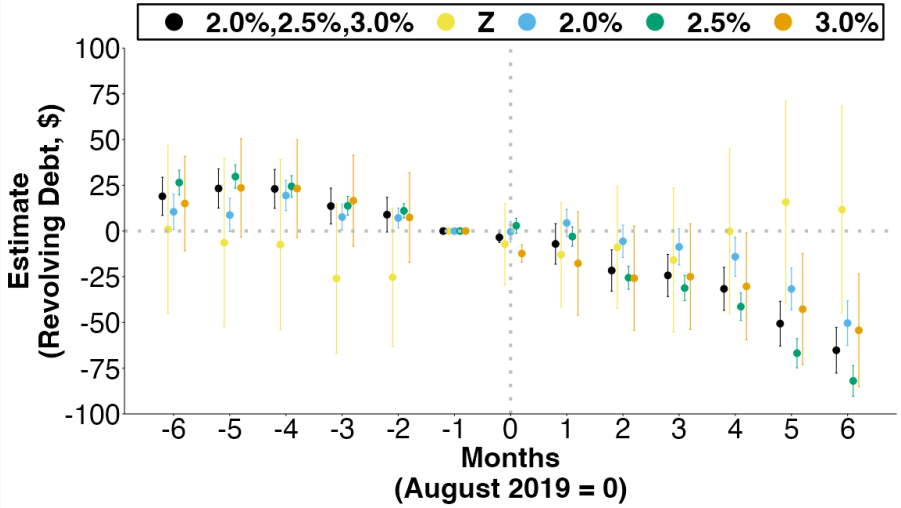
Subsample Analysis: Heterogeneous Treatment Groups

Group	Lender	July 2019		August 2019	
		Ontario	Quebec	Ontario	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}

Results: Minimum Payment for Heterogeneous Treatment Groups



Results: Excess Balance for Heterogeneous Treatment Groups



Preliminary: The Supply of Credit

Supply of Credit Card Debt

- Work in progress: use Mintel data to gauge changes in supply of debt before and after policy change.

Supply of Credit Card Debt

- Work in progress: use Mintel data to gauge changes in supply of debt before and after policy change.
- Evidence that just prior to the policy coming in effect, lenders in Quebec offer lower interest rates, lower annual fees, and higher credit limits.

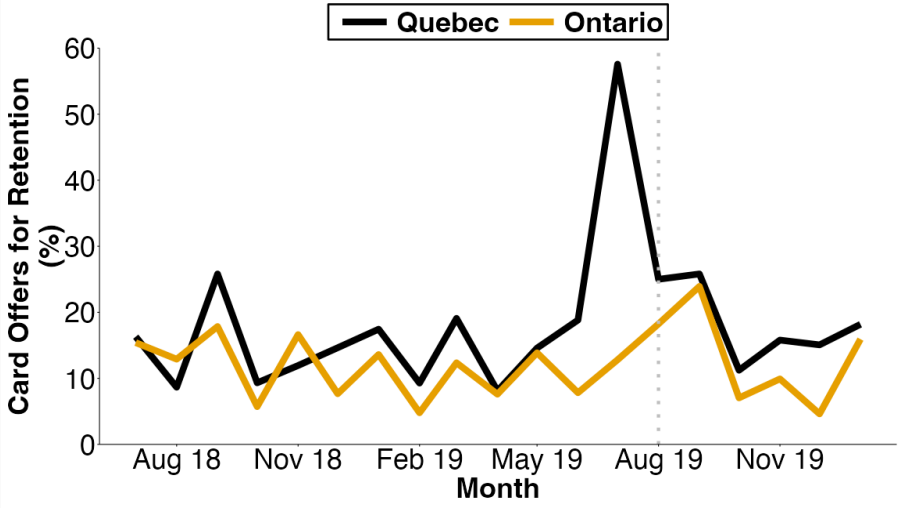
Supply of Credit Card Debt

- Work in progress: use Mintel data to gauge changes in supply of debt before and after policy change.
- Evidence that just prior to the policy coming in effect, lenders in Quebec offer lower interest rates, lower annual fees, and higher credit limits.
- Patterns consistent with lenders wanting consumers to open cards with pre-policy change minimum payments.

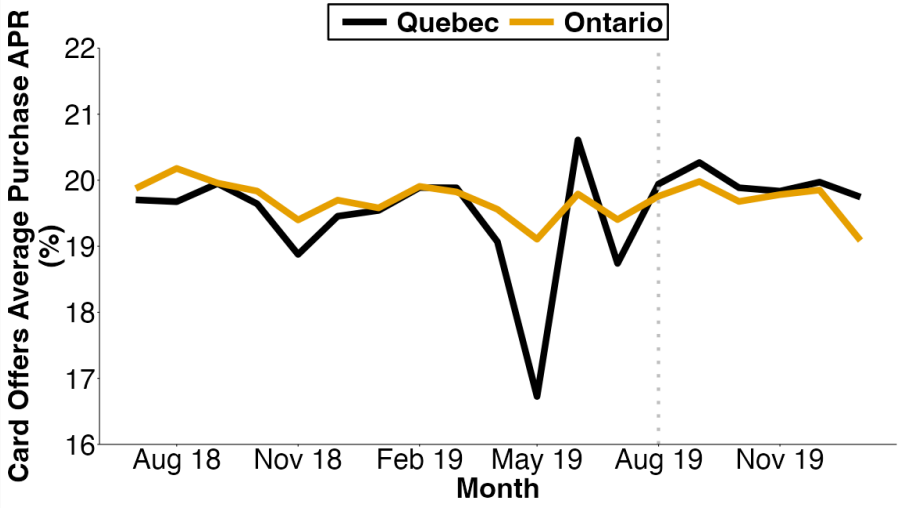
Supply of Credit Card Debt

- Work in progress: use Mintel data to gauge changes in supply of debt before and after policy change.
- Evidence that just prior to the policy coming in effect, lenders in Quebec offer lower interest rates, lower annual fees, and higher credit limits.
- Patterns consistent with lenders wanting consumers to open cards with pre-policy change minimum payments.
- Also consistent with lenders wanting to become “top of wallet” for their existing consumers – wallet composition analysis in progress.

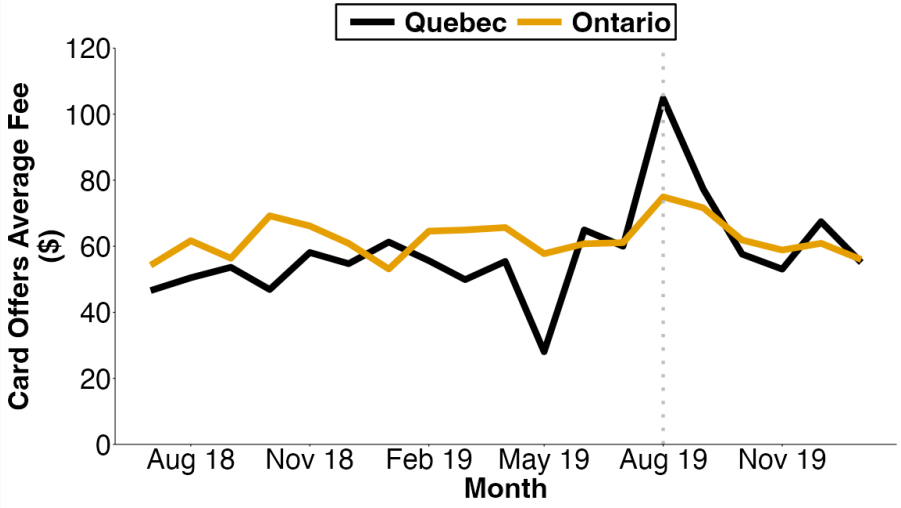
Evidence of Increased Retention Offers



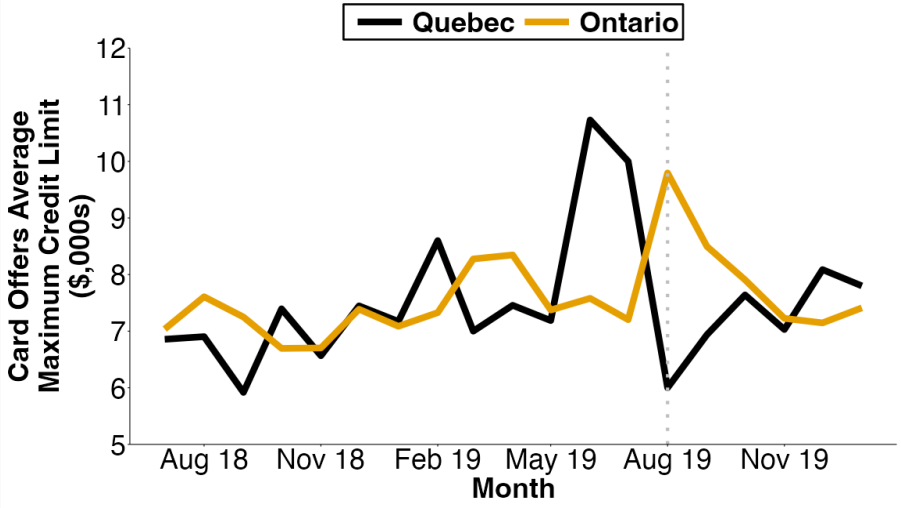
Evidence of Lower APR



Evidence of Lower Annual Fees



Evidence of Larger Credit Limit



Conclusions

- Paternalism (restricting consumer choice) is a tool policymakers can use to help households improve their financial health.

Conclusions

- Paternalism (restricting consumer choice) is a tool policymakers can use to help households improve their financial health.
- In this paper, we quantify trade-offs of hard paternalistic policy: increasing minimum credit card payments.
- Evaluation ultimately depends on how regulator weighs costs vs. benefits.

Conclusions

- Paternalism (restricting consumer choice) is a tool policymakers can use to help households improve their financial health.
- In this paper, we quantify trade-offs of hard paternalistic policy: increasing minimum credit card payments.
- Evaluation ultimately depends on how regulator weighs costs vs. benefits.
- After six months,
  - $64 (3.4%) decrease in revolving credit card debt (more for revolvers).
  - 0.11 pp (10%) increase in delinquency.
- Continuing to study the effect on supply of credit and composition of credit card wallet.

Evaluating Credit Card Minimum Payment Restrictions

Jason Allen[1] Michael Boutros[2] Benedict Guttman-Kenney[3]

5th CEAR-RSI Household Finance Workshop
November 15, 2024

[1]University of Wisconsin [2]University of Toronto [3]Rice University

*The views expressed herein are those of the authors and do not necessarily reflect those of the Bank of Canada.