

# How Do Mortgage Rate Resets Affect Consumer Spending and Debt Repayment? Evidence from Canadian Consumers

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- ▶ In recessions, central banks cut policy rates to stimulate the economy.
- ▶ One transmission channel is the ***consumer cash-flow channel***:  
**Mortgage rate  $\downarrow$   $\Rightarrow$  lower mortgage payment  $\Rightarrow$  higher consumption**
  - ▶ In the U.S., consumers refinance long-term fixed-rate mortgages.
  - ▶ In other countries, consumers often experience automatic mortgage rate resets (ARMs are popular outside of the U.S.).
  - ▶ Powerful channel: Mortgage is largest component of household debt.
- ▶ Key questions:
  1. The effect of this channel on consumer spending and savings
  2. Are the effects symmetric between rate decreases and increases?

- ▶ U.S. mortgage market:
  - ▶ Refinancing decisions depend on borrowers' characteristics.  
⇒ **Concern: Endogeneity**
  - ▶ Adjustable-rate mortgage borrowers ([Di Maggio et al. 2017](#))  
⇒ **Concern: Not representative** for most mortgage borrowers
- ▶ Other countries:
  - ▶ Comparing ARM borrowers with FRM borrowers ([Jappelli & Scognamiglio 2018](#); [La Cava et al. 2016](#); [Floden et al. 2016](#))  
Comparing mortgagors with outright homeowners ([Agarwal et al. 2019](#))  
⇒ **Concern: Selection bias**
  - ▶ Limited consumer and mortgage data

Focus on Canadian mortgage market and consumers:

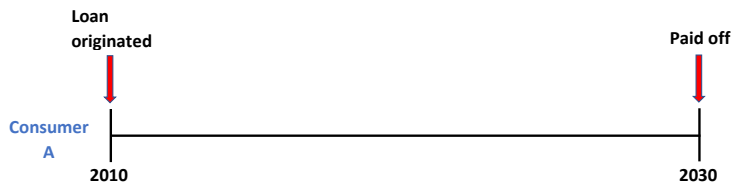
1. Institutional features facilitate a clean identification design
2. Detailed data on consumers and mortgages from a major credit agency
3. Both expansionary and contractionary MP episodes in recent years

- ▶ Dominated by short-term fixed-rate mortgages (most common: **5-year**)
- ▶ **Contract Renewal/Rate Reset:**  
Mortgage rate is fixed within a term but has to be reset at the end of the term according to the prevailing market rate.
- ▶ **Strategy:**  
Compare two borrowers similar in every aspect, except that one borrower resets her mortgage rate earlier than the other borrower
- ▶ **Identification:**  
Exploit variation in the predetermined timing of mortgage rate resets

1. Data
2. Empirical strategy
3. Micro-level effects
  - ▶ Loan-level: mortgage rate, payment
  - ▶ Consumer-level: consumer spending, debt repayment, default
  - ▶ Heterogeneity across consumers
4. Macro-level effects
  - ▶ Aggregate spending

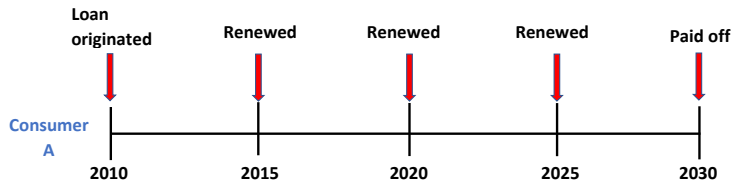
- ▶ **TransUnion Canada**
  - ▶ Account-level panel data on mortgages, auto loans, credit cards, lines of credit, installment loans, linked by consumer identifiers
  - ▶ Static information at origination + monthly updates on performance
- ▶ Our sample: Mortgage borrowers from one of the largest banks
  - ▶ The only major bank that reports timing of mortgage rate resets
  - ▶ Market share close to 20% ⇒ *Large*
  - ▶ Loan characteristics similar to other banks ⇒ *Representative*
- ▶ Main data blocks
  1. **Consumer characteristics:** credit score, age, postal code, local LTV
  2. **Mortgages:** rate, payment, delinquency, timing of renewal
  3. **Non-mortgage debt:** durable spending, revolving debt repayment

# Empirical Strategy - An Illustration

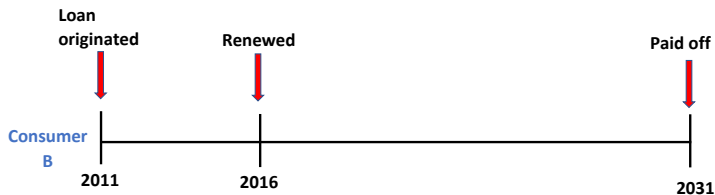
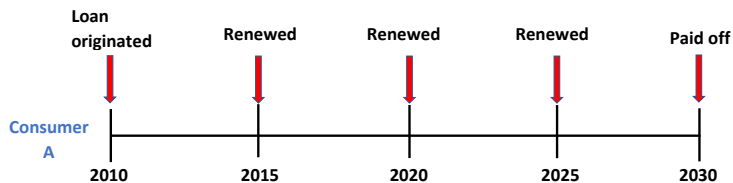




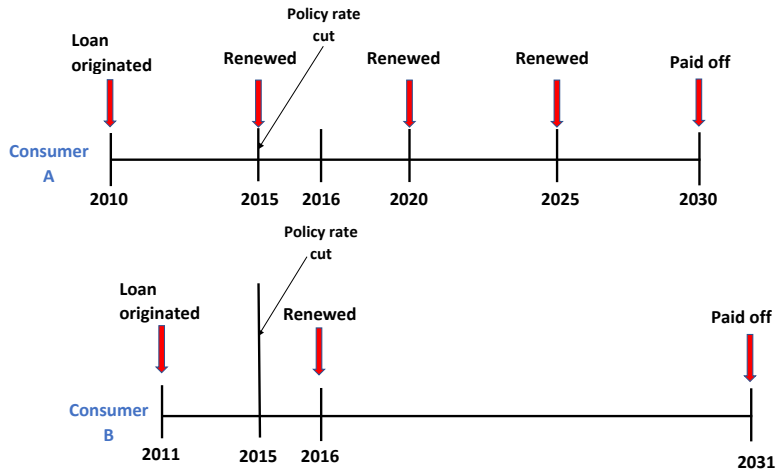
# Empirical Strategy - An Illustration



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# Empirical Strategy - An Illustration



- ▶ Other institutional features
  - ▶ Prepayment penalties:
    1. Three months of interest on the remaining balance
    2. Interest differential based on the change in rate
      - ⇒ *No incentive to prepay*
  - ▶ No reassessment of credit score, LTV and DTI, if renewing with the current lender
    - ⇒ *Resets not depend on borrower characteristics*
- ▶ Identification
  - ▶ **Timing** of mortgage rate reset is predetermined
  - ▶ **Change** in mortgage rate upon reset is
    - ▶ driven by evolution of prevailing market interest rate
    - ▶ exogenous w.r.t. consumer's income, home equity and spending

$$y_{j,t} = \alpha_0 + \alpha_1 PostRenew_{j,t} + \alpha_2 \mathbf{x}_{j,t} + \gamma_j + \delta_t + \varepsilon_{j,t}$$

$y_{j,t}$ : an outcome variable of consumer  $j$  in month  $t$

$PostRenew_{j,t}=1$  after renewal; =0 before renewal

$\alpha_1$ : effect of mortgage rate reset

- ▶ Expansionary episode (rates decrease)

Sample: all mortgages reset in 2015.1-2017.1 (~ 88k)

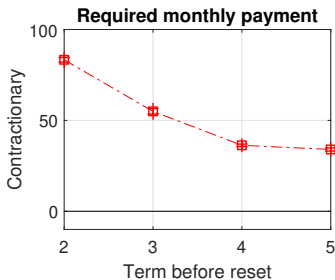
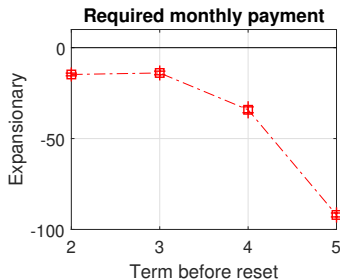
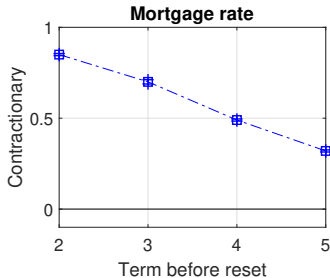
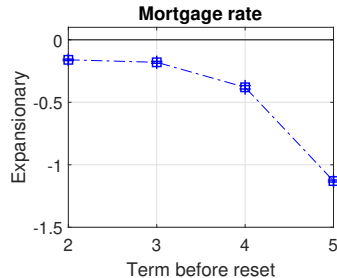
- ▶ Contractionary episode (rates increase)

Sample: all mortgages reset in 2017.7-2019.6 (~ 85k)

- ▶ We group consumers according to their mortgage terms before the reset (2, 3, 4, 5 years) and estimate the effects separately for each group.

1. Data
2. Empirical strategy
3. **Micro-level effects**
  - ▶ **Loan-level: mortgage rate, payment**
  - ▶ **Consumer-level: consumer spending, debt repayment, default**
  - ▶ **Heterogeneity across consumers**
4. Macro-level effects
  - ▶ Aggregate spending

# Change in Mortgage Rate and Required Payment After Reset



\* Required payments are computed using the amortization before the reset

# Change in Total Payment

|                | <i>Expansionary episode</i> |                      |                   | <i>Contractionary episode</i> |                      |                   |
|----------------|-----------------------------|----------------------|-------------------|-------------------------------|----------------------|-------------------|
|                | Remaining months            | Monthly payment (\$) | Total change (\$) | Remaining months              | Monthly payment (\$) | Total change (\$) |
| <u>FRM-5yr</u> | 227                         | -92.03               | <b>-20,891</b>    | 208                           | +34.00               | <b>+7,072</b>     |
| <u>FRM-4yr</u> | 208                         | -34.17               | <b>-7,107</b>     | 197                           | +36.29               | <b>+7,149</b>     |
| <u>FRM-3yr</u> | 209                         | -13.91               | <b>-2,907</b>     | 205                           | +54.98               | <b>+11,271</b>    |
| <u>FRM-2yr</u> | 219                         | -14.74               | <b>-3,228</b>     | 230                           | +83.33               | <b>+19,165</b>    |



# Change in Total Payment

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- ▶ Next, we study the effect of mortgage rate resets on
  1. Durable spending
  2. Mortgage paydown
  3. Non-mortgage debt paydown (credit cards, lines of credit)
  4. Defaults

# I. Response of Durable Spending

► Measures:

1. Newly originated auto loans ⇒ Spending on automobiles
2. Newly originated installment loans ⇒ Spending on other durables

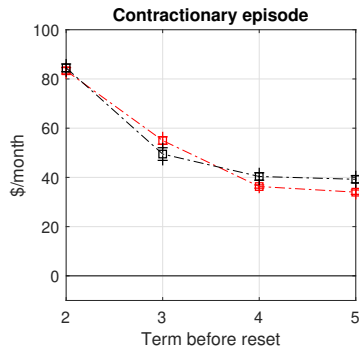
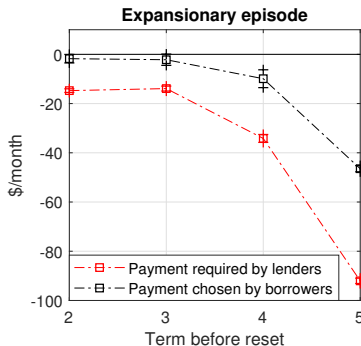
Amount spent (\$/month) and likelihood of spending (%)

|                | <i>Expansionary episode</i> |                |                        |                 | <i>Contractionary episode</i> |          |                        |                 |
|----------------|-----------------------------|----------------|------------------------|-----------------|-------------------------------|----------|------------------------|-----------------|
|                | Auto (\$/month)             | Auto (%)       | Installment (\$/month) | Installment (%) | Auto (\$/month)               | Auto (%) | Installment (\$/month) | Installment (%) |
| <b>FRM-5yr</b> | <b>18.6***</b>              | <b>0.07***</b> | <b>44.4***</b>         | <b>0.14***</b>  | 7.1                           | 0.02     | 22.4                   | 0.04            |
|                | (6.09)                      | (0.02)         | (12.03)                | (0.03)          | (8.34)                        | (0.02)   | (15.55)                | (0.04)          |

► Heterogeneity:

In the expansionary episode, spending is higher for young borrowers and for borrowers with high credit scores

## II. Mortgage Paydown



- ▶ **Expansionary episode:** Use part of interest gains to pay down mortgage
- ▶ **Contractionary episode:** Raise payment to the required level
- ▶ **Heterogeneity:** constrained borrowers pay down less in expansionary episode

### III. Deleveraging of Consumer Debt

|                | <i>Expansionary episode</i> |                   |                               | <i>Contractionary episode</i> |                  |                                  |
|----------------|-----------------------------|-------------------|-------------------------------|-------------------------------|------------------|----------------------------------|
|                | Credit cards                | Lines of credit   | Total revolving               | Credit cards                  | Lines of credit  | Total revolving                  |
| <u>FRM-5yr</u> | -161***<br>(32.54)          | 252**<br>(120.79) | <b>101</b><br><b>(124.59)</b> | -247***<br>(40.73)            | -279<br>(210.50) | <b>-438**</b><br><b>(213.42)</b> |

- ▶ **Expansionary episode:** Pay down credit card debt but accumulate debt on lines of credit ⇒ Overall no change
- ▶ **Contractionary episode:** Pay down credit card debt and lines of credit debt ⇒ Overall deleveraging
- ▶ Heterogeneity: constrained borrowers deleverage less in both episodes

## IV. Change in Default Rate

- ▶ Default measure (‰): Prob. of delinquent on payment for 60+ days for at least one account

|                | <i>Expansionary episode</i> |                 |                   |                | <i>Contractionary episode</i> |                 |                   |                 |
|----------------|-----------------------------|-----------------|-------------------|----------------|-------------------------------|-----------------|-------------------|-----------------|
|                | Mortgage                    | Auto loans      | Installment loans | Credit cards   | Mortgage                      | Auto loans      | Installment loans | Credit cards    |
| <u>FRM-5yr</u> | -1.10***<br>(0.20)          | -0.13<br>(0.07) | -0.13<br>(0.09)   | 0.00<br>(0.00) | -0.27<br>(0.19)               | -0.06<br>(0.08) | -0.16<br>(0.12)   | -0.42<br>(0.26) |

- ▶ Overall, not much change in either episode

- ▶ At micro level:
  - ▶ When mortgage rates decrease
    - ▶ durable spending increases
    - ▶ consumers pay down mortgage debt

*Expansionary MP stimulates consumer spending and improves balance sheets*
  - ▶ When mortgage rates increase
    - ▶ durable spending does not change
    - ▶ consumers pay down non-mortgage debt

*Contractionary MP does not appear to hurt consumers through higher mortgage rates*
- ▶ At macro level: spending increases when consumers reset to lower rates.

## Aggregate Spending Effect:

$$\sum_D \underbrace{\Delta R_t^D}_{\text{rate change}} \times \underbrace{\varepsilon^D}_{\text{spending elasticity}} \times \underbrace{\phi_t(D)}_{\text{total \# resets}}$$

