EFFECTS OF REGULATING DEBIT CARD INTERCHANGE FEE: EVIDENCE FROM BRAZIL

The views expressed in this paper are those of the authors and should not be interpreted as reflecting the views of the Central Bank of Brazil.

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What we do

- We analyze the empirical results of implementing, in October 2018, maximum thresholds ("cap") to debit card interchange fees.
  - The regulation establishes the limits of 0.5% for the average fee weighted by the value of the transactions, measured on a quarterly basis, and 0.8% as the maximum fee to be applied in any transaction.
- We evaluate the impact of this measure on:
  - cards issuers' revenues from debit and credit interchange fees;
  - merchant discount rate (MDR) of debit transactions;
  - debit and credit cards' usage; and
  - debit card scheme fees paid by card issuers and acquirers.

Motivations

- Why intervene?
  - The pricing model in the payment card industry (two-sided market) makes it especially difficult for consumers to perceive costs and benefits.
  - The complexity in the definition of prices in this industry may intensify this information asymmetry among economic agents and undermine markets' self-discipline.
- The Central Bank of Brazil points out the following motivations for introducing this cap on debit card interchange fees:
  - encouraging the use of debit card in the country;
  - giving more transparency of the pricing structures of payment instruments to end users;
  - decreasing cross-subsidies among payment instruments; and
  - inhibiting the overuse of more expensive payment instruments.

Literature Review

- Theory
  - two-sided markets (Chakravorti, 2003); price-elasticity of demand and network externalities (Rysman, 2009); merchant internalization (Rochet and Tirole, 2011; Wright, 2012).
- Empirically
  - A decrease in the interchange fee leads to a larger effect on the MDR than on card holders' annuities and expands the Brazilian credit card market (number of cards, number of transactions per active cards and number of transactions) – (Rezende, 2019);
  - The introduction of a threshold on interchange fees has an impact on the pass-through to the MDR and on the use (number of acquired transactions in proportion to the number of point of sale – POS terminals) of credit and debit cards (Ardizzi and Zangrandi, 2018).
  - However, the increase of acquirers' profit margin, the rise of card scheme fees (Ernest & Young, 2020), or a market growth lower than expected (Veljan, 2018) could prevent the potential gains of the regulation.

Data

- Brazil offers an interesting setup for this study as long as it has one of the largest payment cards' markets worldwide.
  - We use a unique proprietary data extracted from a payments' database afforded by the Central Bank of Brazil.
- This dataset comprises information provided by credit card issuers and acquirers on interchange fees, merchant discount rates, volume and value of debit transactions and card scheme fees throughout the country.
- Our sample runs from 2016Q1 to 2020Q1, on a quarterly basis, which is sufficient to accommodate upward and downward economic cycles affecting payment cards' market.
  - Moreover, a longer period could make it difficult to accurately assess the effects of the cap, since events not connected to the regulation could influence the results.

Summary Statistics

Study	Variable	Unit	Obs	Mean	SD[a]	Min	Max
IC[b] fee income	Debit	R$/card	134	7.976	3.039	2.884	20.361
	Credit	R$/card	272	34.088	40.389	1.469	246.865
MDR	Debit MDR	%	130	1.506	0.239	0.994	2.020
	Credit MDR	%	130	2.574	0.277	2.099	3.212
	Debit acquirer's market share	%	130	13.077	21.751	0.001	72.805
	Credit acquirer's market share	%	130	13.077	20.173	0.001	66.205
	Debit acquirer's Lerner index[c]		130	0.162	0.318	-1.060	0.781
	Credit acquirer's Lerner index[c]		130	0.193	0.228	-0.474	0.699
Cards usage	Debit value of transactions	R$ Bi	130	23.455	38.956	0.153	139.395
	Credit value of transactions	R$ Mi	130	34.751	53.563	0.161	191.618
	Debit network size	Mi	130	111.263	10.510	97.340	133.618
	Credit network size	Mi	130	85.933	4.660	80.508	94.213
	GDP	R$ Tri	130	1.527	0.037	1.461	1.598
	Number of POS terminals	1,000's	130	687.617	674.555	0.992	2,329.180
	Debit number of transactions	Mi	130	400.073	651.436	0.028	2,293.343
	Credit number of transactions	Mi	130	315.148	487.684	0.019	1,719.405
Scheme fees	Issuer's scheme fees	%	283	0.311	0.133	0.064	0.847
	Acquirer's scheme fees	%	114	0.133	0.068	0.010	0.294
	Issuer's market share	%	283	6.007	8.988	0.019	31.735
	Acquirer's market share	%	114	14.912	19.663	0.001	56.640
	Schemes' HHI		397	3767.504	84.811	3594.811	3937.558

Note: [a] Standard Deviation [b] Interchange [c] Also employed on the cards usage study

Data Overview

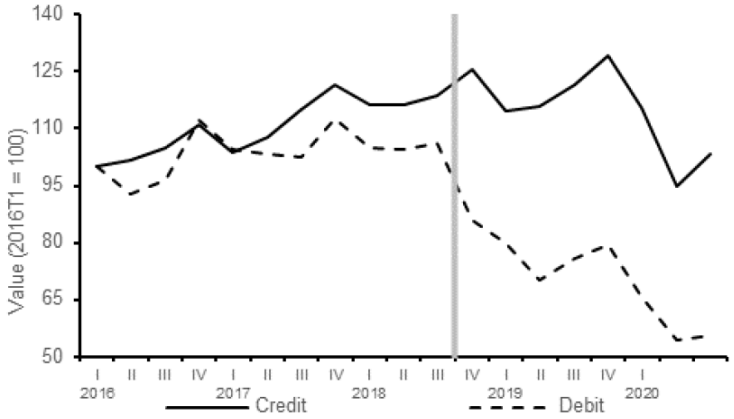

Fig. 1. Mean real interchange fee revenues per card

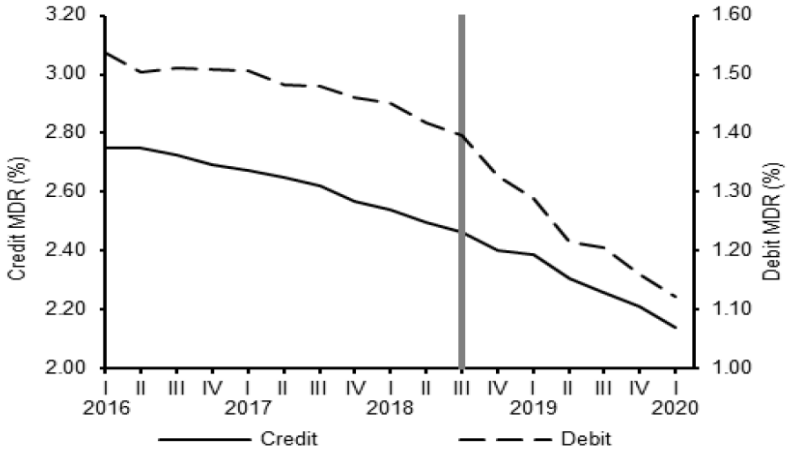

Fig. 2. Mean market MDR by function

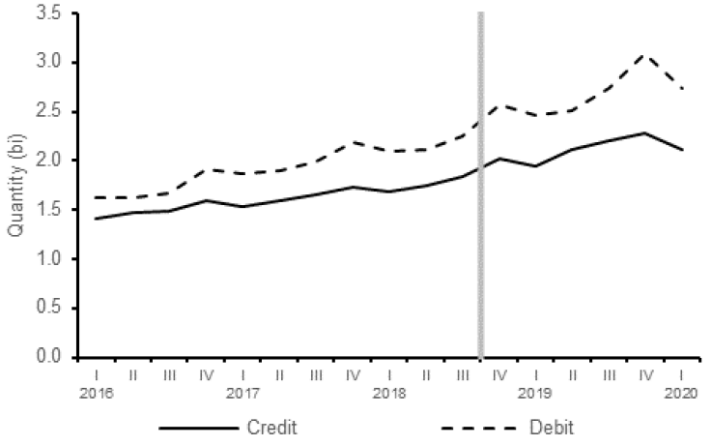

Fig. 4. Quantity of transactions by function

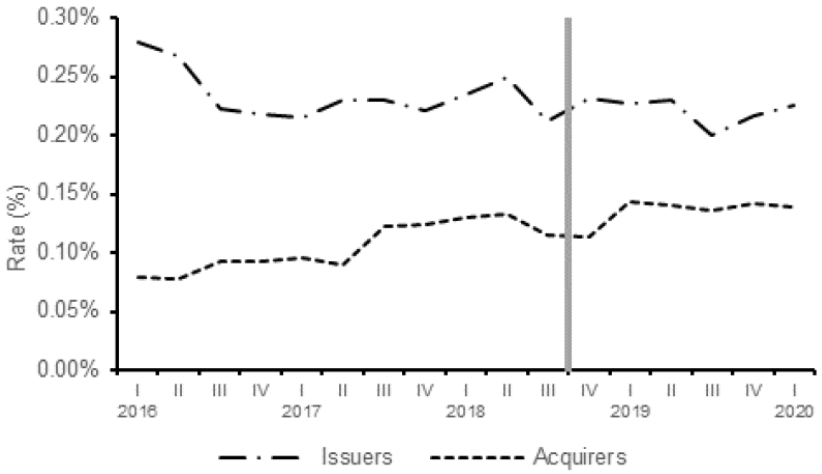

Fig. 5. Scheme fees by participant's role

Methodology and Results

- Card issuers' revenues
  - Methodology

$$ln\,(Y_{i,t}) = \beta_0 + \beta_1 cap_t + \lambda_i + \tau_t + t + \varepsilon_{i,t}\ ,$$

$Y_{i,t}$: average deflated revenue for card issuer i and period t, per active card, from credit or debit card interchange fees;

cap_t: dummy variable equal to 1 from 2018Q4 onwards and to zero in the remaining cases;

λ_i: card issuers' fixed effects;

τ_t: seasonality for the 4th quarter of each year;

t: time trend; and

$\varepsilon_{i,t}$: error.

Methodology and Results

- Card issuers' revenues
  - Results
    - We find a reduction of 32.4% in the average deflated revenue, per active card, from debit cards' interchange fee after the cap.
    - This result represents 91.5% of the unconditional reduction in debit cards' revenues from interchange fees observed in the same period.
    - It suggests that an increase in the volume of debit cards' transactions slightly compensates for part of the cap.
    - There is no evidence, however, that the cap increases or decreases credit cards' revenues from interchange fees.

Methodology and Results

- MDR
  - Methodology

$$ln\left(Y_{i,t}\right) = \beta_0 + \beta_1 Q_1 + \cdots + \beta_{16} Q_{16} + \beta_{17} ln\left(L_{i,t}\right) + \beta_{18}\, ln(Mks_{i,t}) + \lambda_i + \varepsilon_{i,t}$$

$Y_{i,t}$: merchant discount rate (MDR) in debit card transactions charged by acquirer i in period t;

Q_t: dummy variables for each of the 16 quarters, except for 2018Q3, used as a basis for comparison;

$L_{i,t}$: competition index among acquirers, represented by the Lerner Index, which measures a company's market power by the difference between that it charges and its marginal cost and is measured in proportion to the price;

$Mks_{i,t}$: market share of acquirers in the value of card transactions (Ardizzi & Zangrandi, 2018);

λ_i: fixed effects per acquirer; and

$\varepsilon_{i,t}$: error.

Methodology and Results

- MDR
  - Results indicate a reduction from 6.0% (2018Q4) to 22.8% (2020Q1) in the debt card MDR after the cap.
  - It suggests the impact of the cap on the MDR tends to increase in magnitude over time.
  - Based on these results, we calculate the pass-through of the cap to the MDR, which rises from 16.9% in 2018Q4 to 64.3% in 2020Q1.

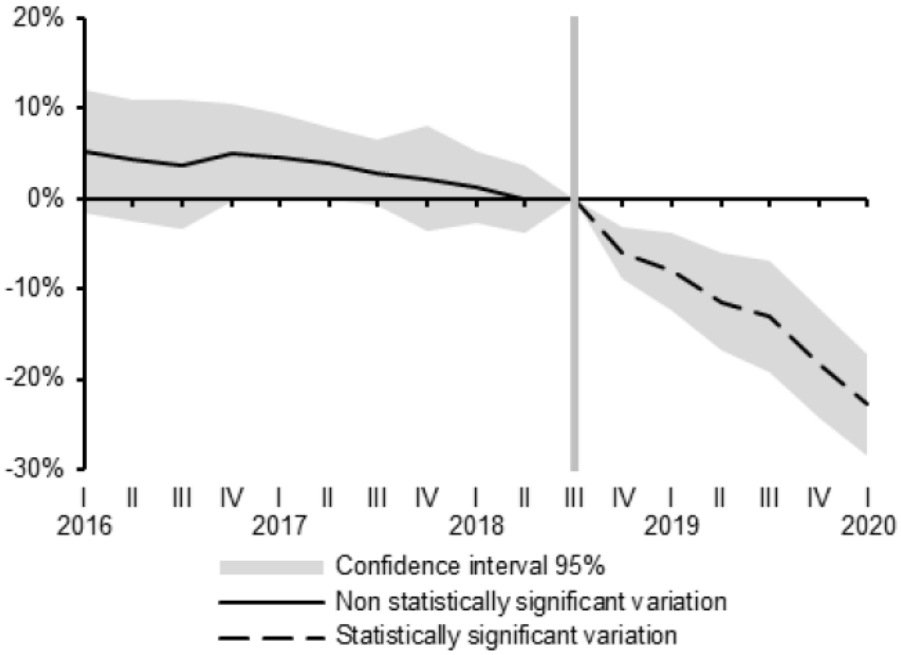

Fig. 6. Debit MDR variation over 2018T3

Methodology and Results

- MDR

$$ln(Y_{i,t}) = \beta_0 + \beta_1 function_i + \sum_{j=2,t=1}^{j=17,t=16} \beta_j Q_t + \sum_{j=18,t=1}^{j=33,t=16} \beta_j Q_t * function_i + \beta_{34}\, ln\,(L_{i,t}) + \beta_{35}\, ln\,(Mks_{i,t}) + \lambda_i + \varepsilon_{i,t}$$

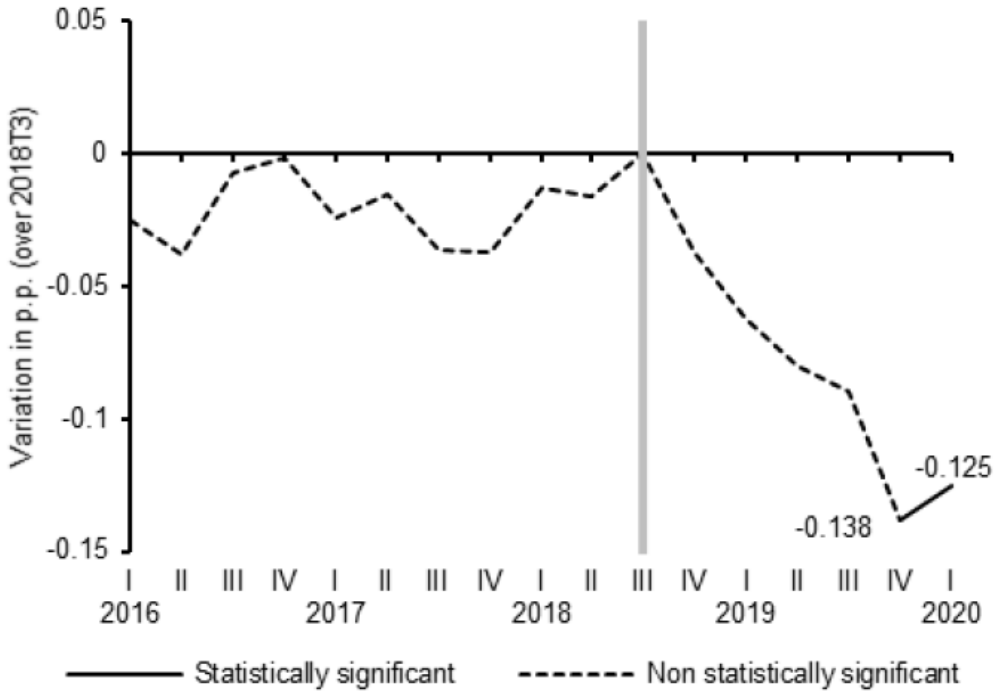

Fig. 7. Difference between credit and debit MDR

Methodology and Results

- Debit and credit cards' usage
  - Methodology

$$ln\,(Y_{i,t}) = \beta_0 + \beta_1\, cap_t + \beta_2\, ln\,(L_{i,t}) + \beta_3\, ln(N_t) + \beta_4\, ln(GDP_t) + \beta_5\, ln(POS_t) + \lambda_i + \tau_t + t + \varepsilon_{i,t}$$

$Y_{i,t}$: volume or value of transactions for acquirer *i* in period *t*;

cap_t: dummy variable equals to 1 from 2018Q4 onwards and to 0 otherwise;

$L_{i,t}$: competition among acquirers represented by the Lerner Index;

N_t : network size (Ardizzi & Zangrandi, 2018);

GDP_t: deflated and adjusted gross domestic product (Ardizzi & Zangrandi, 2018);

$POS_{i,t}$: number of POS per acquirer;

λ_i: acquirers' fixed effects;

τ_t:seasonality for the 4th quarter of each year;

t: time trend; and

$\varepsilon_{i,t}$: error.

Methodology and Results

- Scheme fees (Issuer)
  - Methodology

$$Y_{i,t} = \beta_0 + \beta_1 cap_t + \beta_2 VTrans_{i,t} + \beta_3 Mks_{i,t} + \beta_4 HHI_t + \lambda_i + t + \varepsilon_{i,t}$$

$Y_{i,t}$: cost of issuer *i* (financial or payment institution) in period *t* with the scheme in relation to the traded value, as a proxy for the scheme fee;

cap_t: dummy variable equal to 1 from 2018Q4 onwards and 0 otherwise;

$Vtrans_{i,t}$: value of card transactions by issuer;

$Mks_{i,t}$: market share of issuers, considering the value of card transactions;

HHI_t: *Herfindahl-Hirschman* Index in the card schemes sector;

λ_i: issuers' fixed effects;

t: time trend; and

$\varepsilon_{i,t}$: error.

Methodology and Results

- Scheme fees (Acquirer)
  - Methodology

$$Y_{j,t} = \beta_0 + \beta_1 cap_t + \beta_2 VTrans_{j,t} + \beta_3 Mks_{j,t} + \beta_4 HHI_t + Cred_{j=X,t} + \lambda_j + t + \varepsilon_{j,t}$$

$Y_{j,t}$: cost of acquirer j in time t with the scheme in relation to the traded value, as a proxy for the scheme fee;

cap_t: dummy variable representing the cap, equal to 1 from e 2018Q4 onwards and equal to zero in the remaining cases;

$Vtrans_{j,t}$: value of card transactions by issuer;

HHI_t: concentration in the card schemes sector, represented by the *Herfindahl-Hirschman* Index (HHI);

$Mks_{j,t}$: market share of acquirer in the value of card transactions;

$Cred_{j=X,t}$t: dummy variable to capture specific increases for a given acquirer from 2017Q3 onwards;

λ_j: fixed effect per acquirer;

t: time trend; and

$\varepsilon_{j,t}$: error.

Methodology and Results

- Results
  - Debit and credit cards' usage
    - We do not find empirical evidence that the cap affects the demand for debit and credit cards.
    - The results indicate the regulation does not influence the use of the cheaper mean of payment (debit), regardless of the proxy employed.
  - Scheme fees (issuers and acquirers)
    - We do not find evidence that the cap affects both card issuers' and acquirers' scheme fees in the time frame considered (2018Q4 to 2020Q1);
    - Hence, the cap in the debit card interchange fee does not cause a compensatory decision in favor of card issuers to the detriment of acquirers.

Findings

- We find a gradual and increasing pass-through of the reduction in the interchange fee to the MDR, rising from 16.9% in 2018Q4 to 64.3% in 2020Q1.
- The cap reduces card issuers' earnings with debit card interchange fee proportionally to the cut but does not affect similar revenues from credit cards.
- Overall, the regulation of the debit card interchange fee does not change the dynamics of using debit cards, nor it changes debit card scheme fees.