

Interchange Fee Regulation and Cards Payments: a cross-country Analysis

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Outline

- Motivation and theoretical background
- Literature review
- Data and some stylized facts
- Econometric analysis and results
- Conclusions and steps ahead

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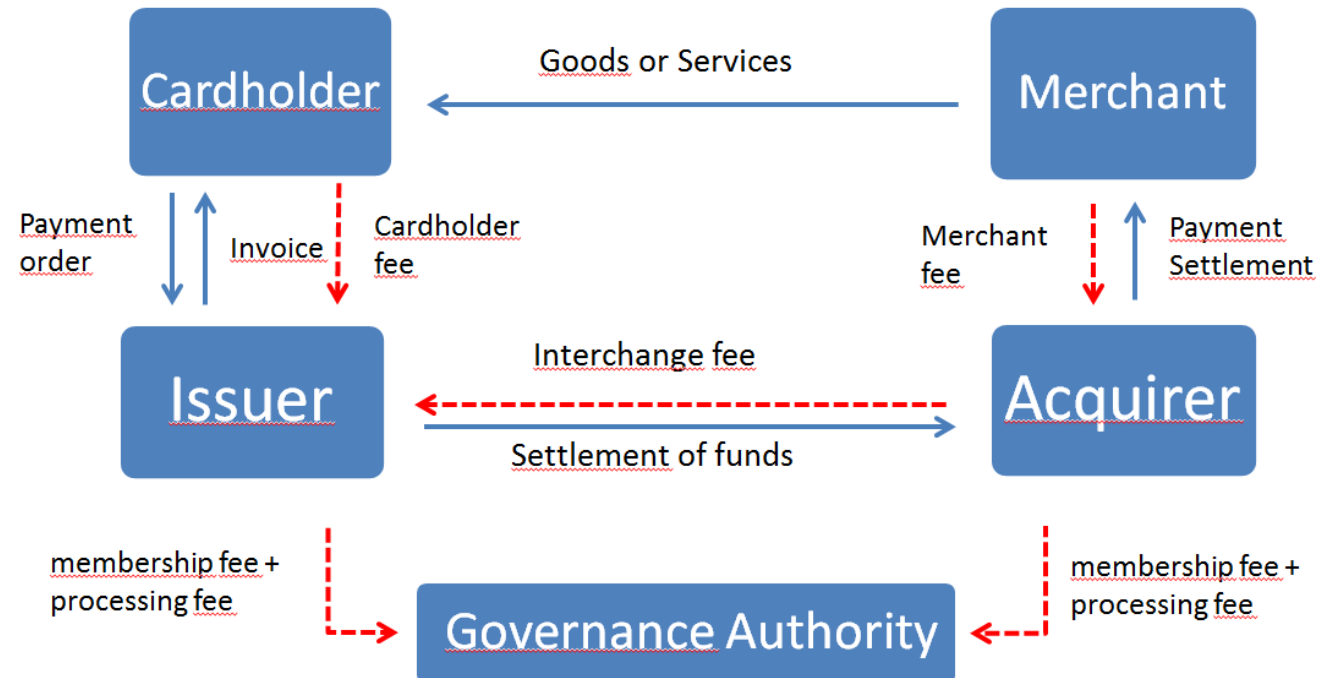
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Motivation and theoretical background

Interchange fee

- amount paid by the *acquirer* to the *issuer* when a card transaction is processed
- compensates card issuing costs (and membership fees)
- represents the largest part of the *merchant fee*

⇒ is a part of the acceptance cost for card payments



Motivation and theoretical background

Interchange Fee Regulation (2015) caps IF for card payments in the EU (28 countries)

The relationship between Interchange Fees and the number of card transactions is not clear (Rochet and Tirole, 2002)

Lower Interchange Fees

⇒ higher *card fees* charged by the *issuer* (or lower consumer protection, services, card rewards)
⇒ lower usage (at merchants accepting them)
⇒ transactions down

⇒ lower *merchant fees*
⇒ higher acceptance
⇒ higher usage
⇒ transactions up

Depending on merchants' resistance to increase fees, consumers' preferences, competition among *acquirers* (pass-through) and/or among *issuers*...total effect far from obvious

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Literature Review

- **Interchange fee theoretical rationale and implications**
 - Rochet and Tirole (2002) balancing externalities in two-sided market
- **Interchange fee regulation and cards payments: scant international evidence**
 - European Commission (2020)
 - Within-country evidence: Ardizzi (2013), Ardizzi&Zangrande (2018), Carbó Valverde *et al.* (2016) (increase in card-based transactions through increased merchants' adoption. More mixed evidence in the US (Kay *et al.*, 2014, Wang *et al.*, 2014)

cross-country and over time empirical evidence still missing:

- No control for country fixed factors (e.g., preference for cash)
- No countrywide and regional trends

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Data and some stylized facts

Novel dataset

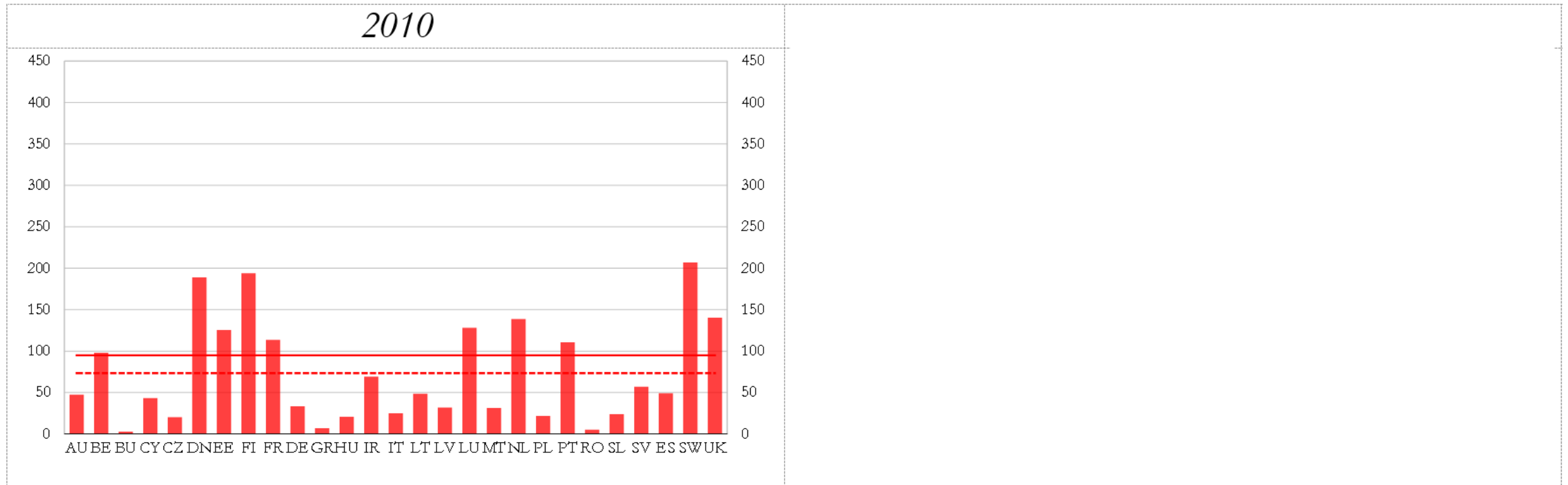
- ✓ interchange fees on credit and debit cards: Kansas Fed paper reports complemented with VISA and Mastercard country reports
- ✓ number of cards payments per capita: ECB (EU27 countries), BIS (CPMI countries), Kansas Fed (other countries), NCBs reports
- ✓ GDP per capita and other macro controls: ECB, World Bank, IMF



The result is a pretty balanced panel of around 50 countries from 2010 to 2020

Data and some stylized facts

Figure 2: Number of card payments per capita in EU28



Source: ECB, BIS, Fed Kansas City. Red and blue lines indicate average values for European (dashed lines) and for extra-EU countries (solid lines).

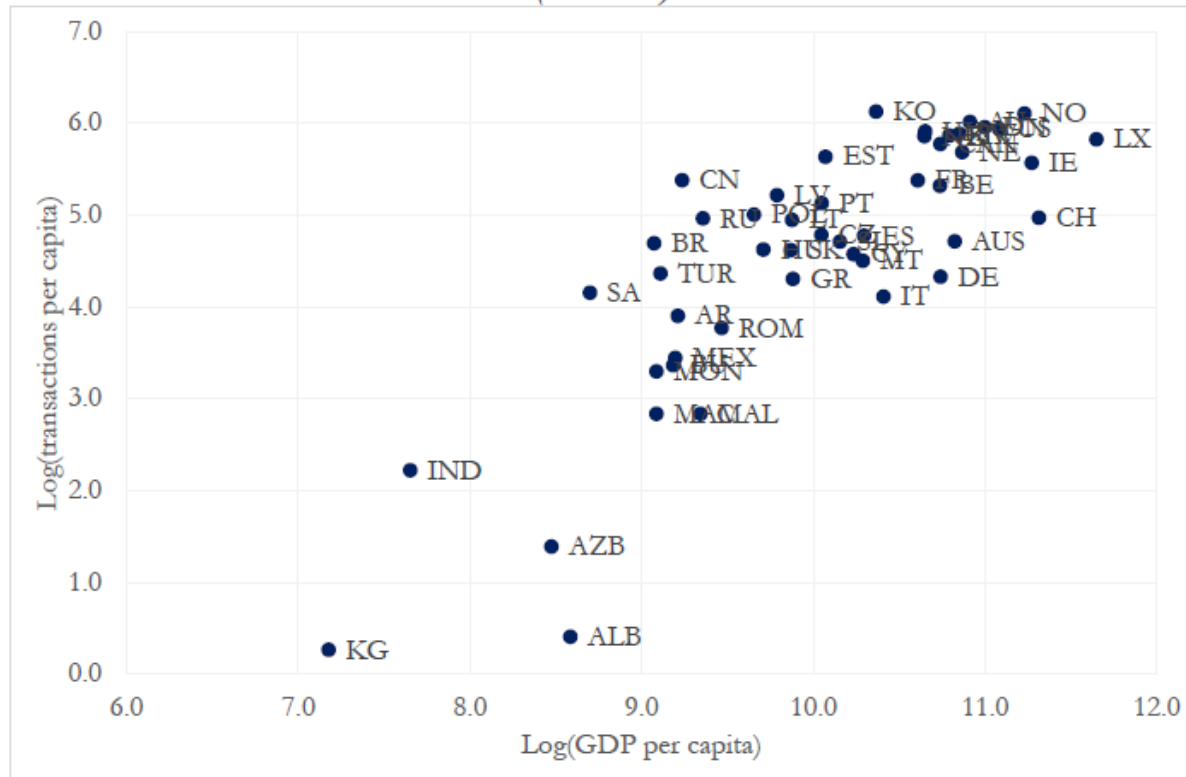
Card transactions per capita increased more in the EU28 than in the extra-EU countries (considered)

Data and some stylized facts

GDP tells something but not the whole story (in particular over time)

Figure 3: Card payments and GDP per capita

*a) Number of card payments and GDP per capita
(2019)*



Source: ECB, BIS, Fed Kansas City and World Bank

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Econometric analysis and results

What we do

We study explicitly the role of IF in explaining heterogeneity in cards payments across countries and over time by exploiting

a) the huge drop in IF in EU countries following the IFR 2015

and

b) the significant heterogeneity both in economic conditions and cards payments dynamic in a large sample of 50 countries over 10 years

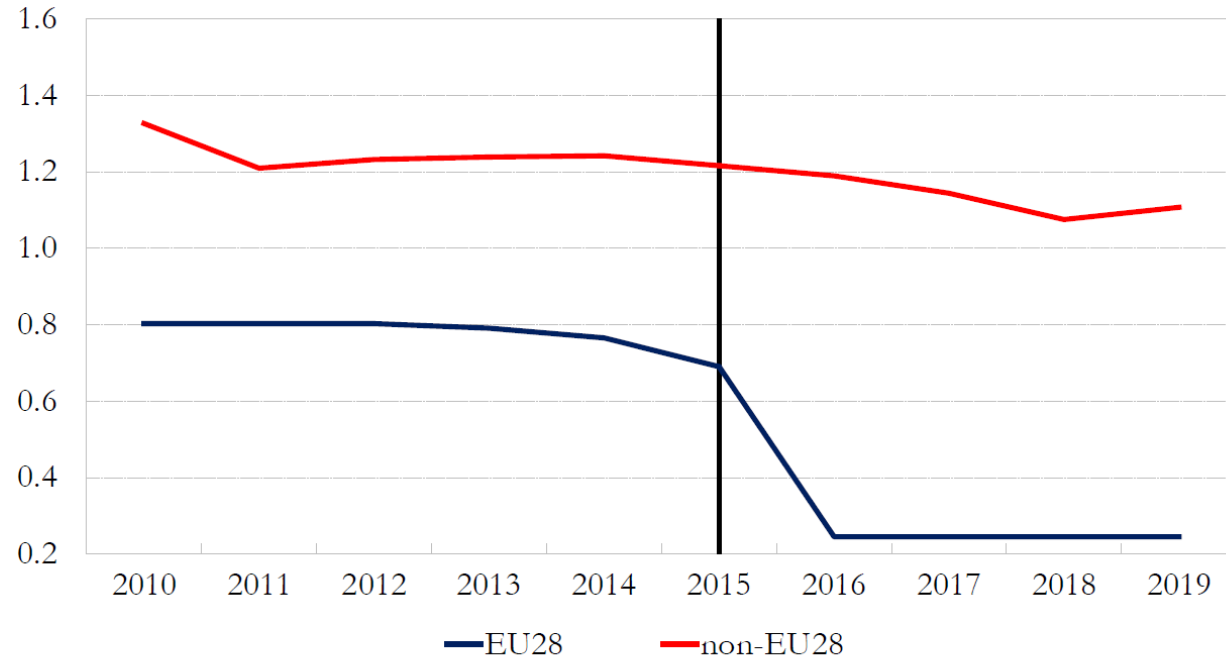
How

1) Panel estimation

2) Diff-in-diff approach

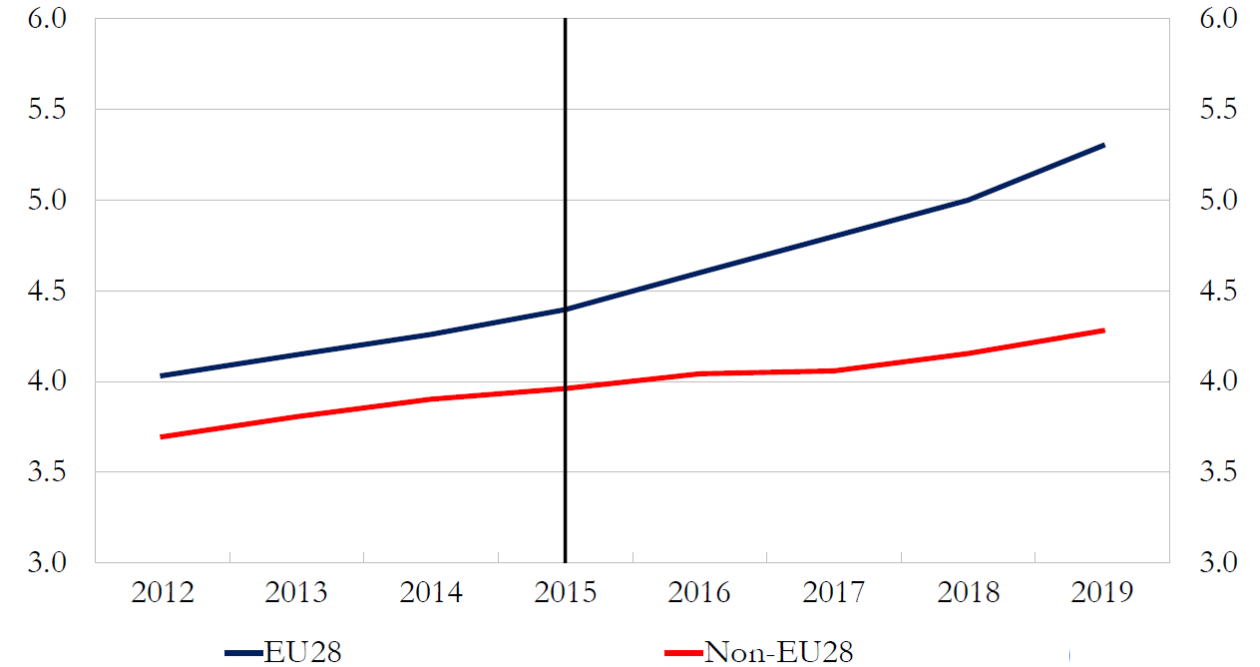
Econometric analysis and results

Figure 1: Average interchange fee over time
(percentage points)



Source: ECB, BIS, Fed Kansas City.

Figure 4: Card transactions: treated and control groups



Source: ECB, BIS, Fed Kansas City and World Bank.

Econometric analysis and results

Panel analysis

$$\log(y_{it}) = \alpha * \log(y_{it-1}) + \beta_1 * IF_{it} + \beta_2 * GDPpc_{it} + \beta_3 * t + \delta_i + \mu_t + \epsilon_{it}$$

$\log(y_{it})$ number of cards (credit and debit) transactions per capita

IF_{it} average interchange fee (credit and debit)

$GDPpc_{it}$ GDP per capita (current US\$)

δ_i country fixed effects

μ_t time fixed effects

t time trend

Identification strategy: country & time fixed effects controlling for country-specific and time varying observables and unobservables

Econometric analysis and results

Panel analysis

dependent variable:	Log(transactions per capita)	Δ Log(transactions per capita)
	(iii)	(iv)
Average Interchange Fee	-0.355***	-0.059**
Log(GDP per capita)	0.358***	0.014
Constant	0.410	0.000
Year & Country fixed effects	YES	YES
Number of groups	46	46
Observations	384	384
Estimation technique	Panel Fixed Effects	

Note. For all specifications sample period is 2010-2019.

A 10bp reduction in the IF is associated to an increase in the number of per capita card-based transactions by about 3.6%, and to a stronger growth of the same aggregate by about 0.6%

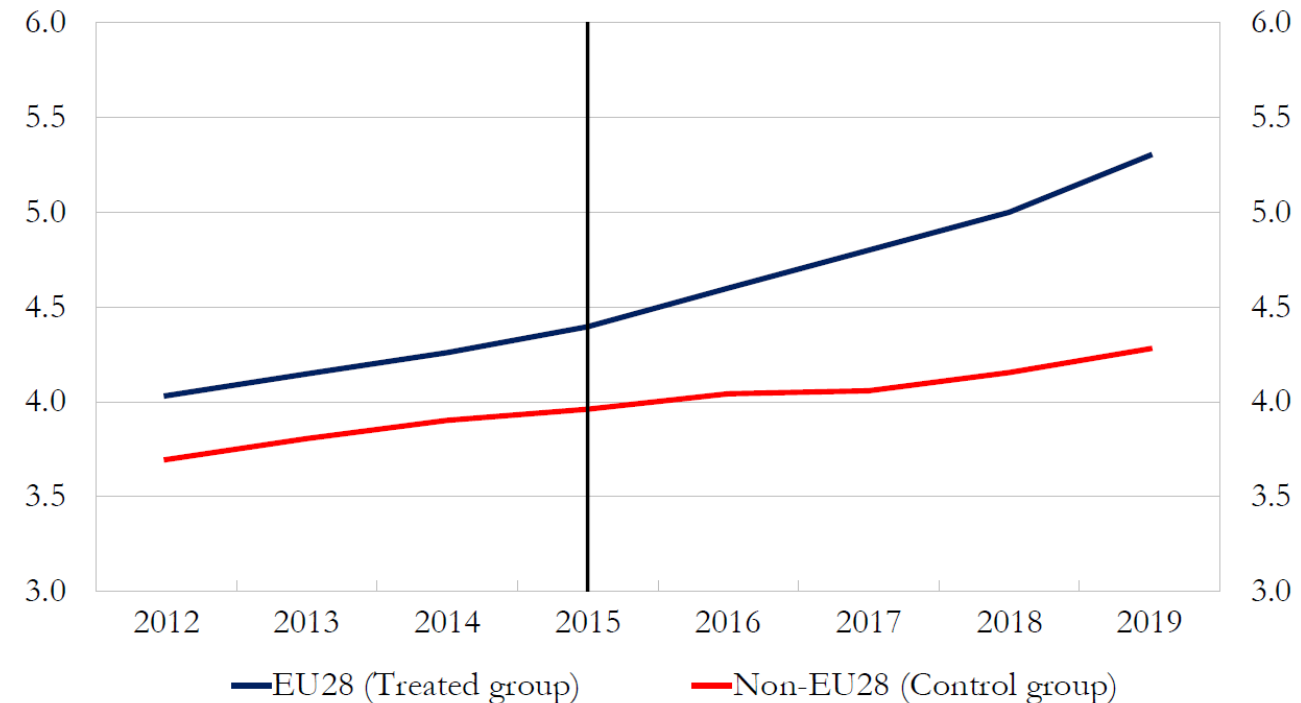
Econometric analysis and results

Diff-in-diff approach

Identification assumptions

- Randomness of the treatment: being part of the EU
- Parallel trend prior to the treatment: untreated units provide the appropriate counterfactual of the dynamics the treated units would have shown if they had not been treated

Figure 4: Card transactions: treated and control groups



Source: ECB, BIS, Fed Kansas City and World Bank.

Econometric analysis and results

Diff-in-diff approach

Control group

14 Countries with no legal or *de facto* (material) changes in IF between 2010 and 2020 (good coverage in terms of geographical areas: 5 non EU Europe, 3 Asia, 2 North America, 1 Africa, 2 South America, 1 Oceania)

Table 6 – Control group validity

	Treated group	Control group
Log(transactions per capita, 2015)	4.4 [2.4-5.7]	3.9 [1.4-5.9]
Log(GDP per capita US\$, 2015)	10.1 [8.9-11.5]	9.6 [8.7-11.1]
Average interchange fee, 2015	0.7 [0.3-1.6]	1.2 [0.6-1.8]
Transactions per capita: var. % 2012-15	22.3	25.0
Transactions per capita: var. % 2015-19	49.8	38.2

Average values; ranges in brackets.

Econometric analysis and results

Diff-in-diff approach

$$\log(y_{it}) = \beta_1 * (TREAT_{it} * POST2015_{it}) + \beta_2 * GDPpc_{it} + \beta_3 * t + \delta_i + \mu_t + \epsilon_{it}$$

$\log(y_{it})$	number of cards (credit and debit) transactions per capita
$TREAT_{it}$	being part of the treatment group (EU countries to which the IFR applies)
$POST2015_{it}$	treatment period
$GDPpc_{it}$	GDP per capita (current US\$)
δ_i	country fixed effects
μ_t	time fixed effects
t	time trend

Econometric analysis and results

Diff-in-diff approach

dependent variable:	a) Log(transactions per capita)		b) Δ Log(transactions per capita)	
	(ii)	(iv)	(vi)	(viii)
TREAT * POST2015	0.311***	0.193***	0.038*	0.067**
Constant	3.765***	4.036***	0.087***	0.114***
Year & Country fixed effects	YES	YES	YES	YES
Sample period	2010-2019	2013-2017	2010-2019	2013-2017
Number of groups	42	42	42	42
Observations	380	200	340	200

Note. For all specifications estimation technique is panel fixed effects.

- ✓ IFR introduction \Rightarrow increase of per capita card payments both in level (31%) and in growth rate (4%) between 2016 and 2019
- ✓ Restricting the analysis to the two years after IFR introduction: relevant effect on the level (19%) and stronger on the growth rate (7%)

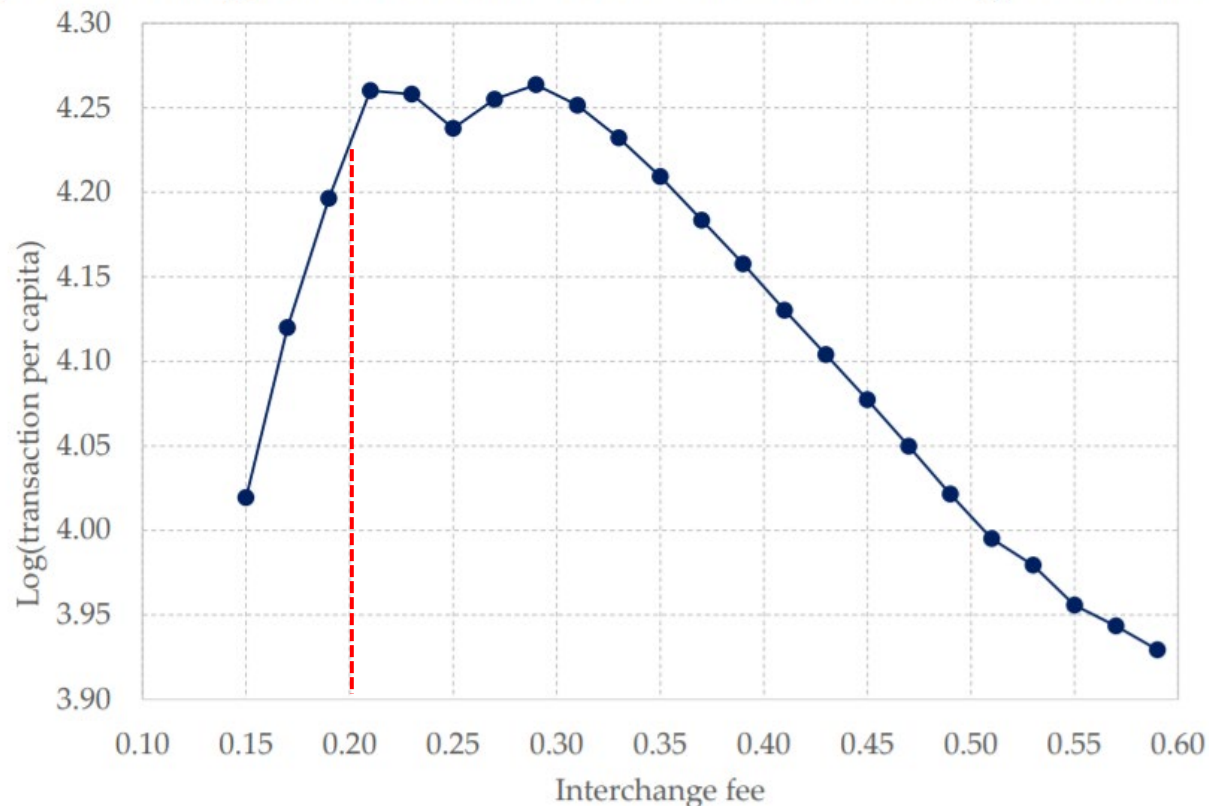
Econometric analysis and results

Sensitivity analysis around the cap

Can the diffusion of card payments benefit by further reductions of the interchange fees?

Local non-parametric estimation around the threshold set by IFR recommends to be careful

Figure 5: Marginal effects at “near-zero interchange fee level”



Source: ECB, BIS, Fed Kansas City.

Maybe demand factors:

issuer not adequately remunerated could shift losses to cardholders by applying higher fees on card usage

⇒ less usage (possibly even with maximum acceptance due to very low *merchant fees*)

also potential barrier for incumbents and/or disincentive for innovation

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Conclusions and steps ahead

Our findings

- ✓ Negative and significant relationship between interchange fees and both the number of card transactions per capita and their growth rates
 - ✓ A 10 bp reduction in the IF is associated to an increase both in the level and in the growth rate of card transactions per capita (3.6 and 0.6%, respectively)
 - ✓ IFR, after its implementation, significantly boosted card usage in EU member countries, in line with the regulatory intentions: with a strong and relevant one-off impact immediately after its introduction and a considerable propagation of its effects in the following years.
- ✓ Containing IF can foster the diffusion of card payments but pushing their level too close to zero (or beyond) may exert unintended and negative effects (shifting costs on users, sustainability, competition and technological developments)

Conclusions and steps ahead

Further work and next steps

- enrich the set of time varying covariates to study the role of competition and concentration in payments systems
 - diff-in-diff with heterogeneous effect
 - other characteristics of the market (BIS)
- opening the box of the link between transactions per capita and IF: number of POS (supply), number of cards (demand).
- use IF differential rates for merchants
 - insert year-country fixed effects
 - study the role of concentration in economic sectors

Thanks for your attention!

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