

What drives distributional dynamics of client interest rates on consumer loans in the Czech Republic? A bank-level analysis

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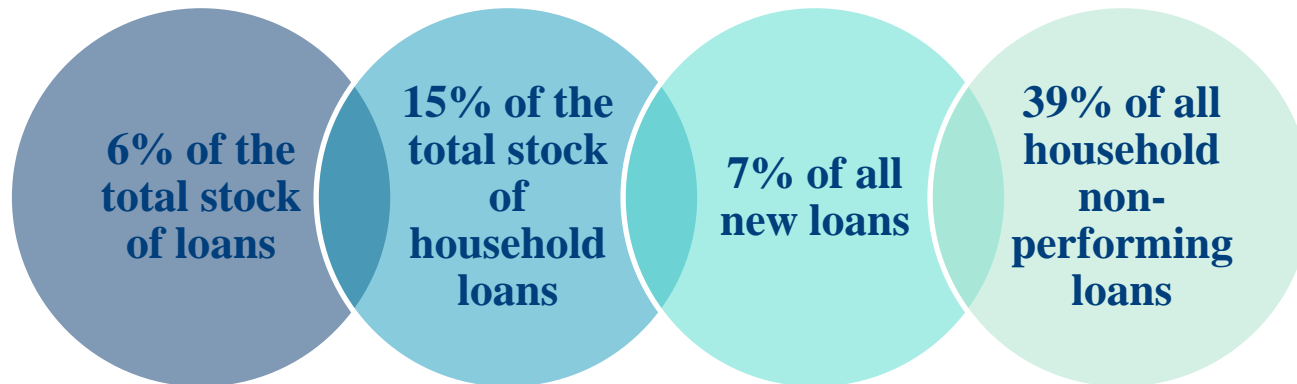
CNB Research Open Day 2018

21. May 2018

The paper represents our own views and not necessarily those of the Czech National Bank.

- Motivation
- Literature review
- Data, variables, hypotheses
- Methodology
- Results
- Conclusions and policy implications

- Consumer loans constitute a non-negligible part of loan portfolios of banks in the Czech Republic loans as for 2017



- Under-researched topic



- Unexplored issues
 - Any dominant fixation (maturity) category?
 - The empirical distribution of client rates on consumer loans?
 - Is it normal or multimodal?
 - Dynamics over time?
 - General trends?
 - Recent evolution?
 - Drivers of client rates?



Drivers of distributional dynamics?

- Distributional dynamics never studied before
- Drivers of client rates on consumer loans
 1. Monetary policy
 - No evidence on the interest rate pass-through from market rates on client rates in the Czech context
 - No cointegration for consumer loans (Horváth and Podpiera, 2012; Havránek et al., 2016)
 - International studies: the pass-through is low and slow relatively to other loan categories (De Graeve et al., 2007; Egert and MacDonald, 2009; Aristei and Gallo, 2014; Gropp et al., 2014)

- Drivers of client rates on consumer loans
 - 2. Credit risk
 - Not assumed by Horváth and Podpiera (2012) but recommended for further research
 - Influences interest rate spreads for consumer loans in the Czech Republic (Hainz et al., 2014)
 - 3. Market competition/concentration
 - Recommended to be used in further research by Horváth and Podpiera (2012) and Havránek et al. (2016)
 - Van Leuvensteijn et al. (2013) find that increased market competition leads to better conditions for customers who take out a consumer loan

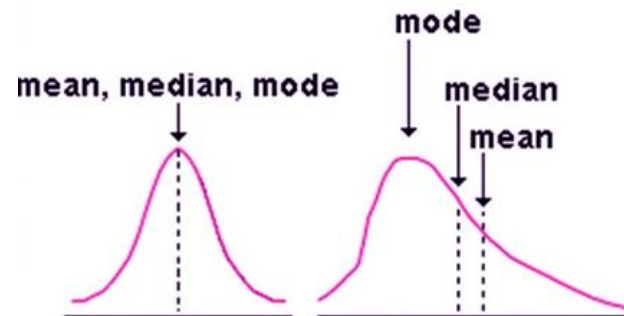
- Further recommendations from the literature:
 - Go for error correction models if your data are non-stationary and cointegrated (e.g., Horváth and Podpiera, 2012; Aristei and Gallo, 2014; Havránek et al., 2016)
 - Take into account the term-structure dimension of the analysis (e.g., Egert and MacDonald, 2009; Brůha, 2011; Havránek et al., 2016)
 - One should relate the client rates on consumer loans (with a certain fixation of the interest rate) to the market rates of a comparable maturity

- Monthly data, sample period: 2007M1 – 2017M12
- New consumer loans, not the stock of consumer loans
 - Rates on the new loans reflect changes in the economic environment faster than client rates on the stock of consumer loans (Horváth and Podpiera, 2012; Hainz et al., 2014)
- Data sources: SNOB, ICD, ARAD

Interest rate interval (in %)	Volume (mil. CZK)	Mean interest rate (in %)
1.01 – 2.00	173.79	1.82
2.01 – 3.00	198.69	2.21
3.01 – 4.00	1.00	3.91
4.01 – 5.00	26.85	4.90
5.01 – 6.00	1.3	5.11
Total volume/Aggregate mean interest rate	401.64	2.23

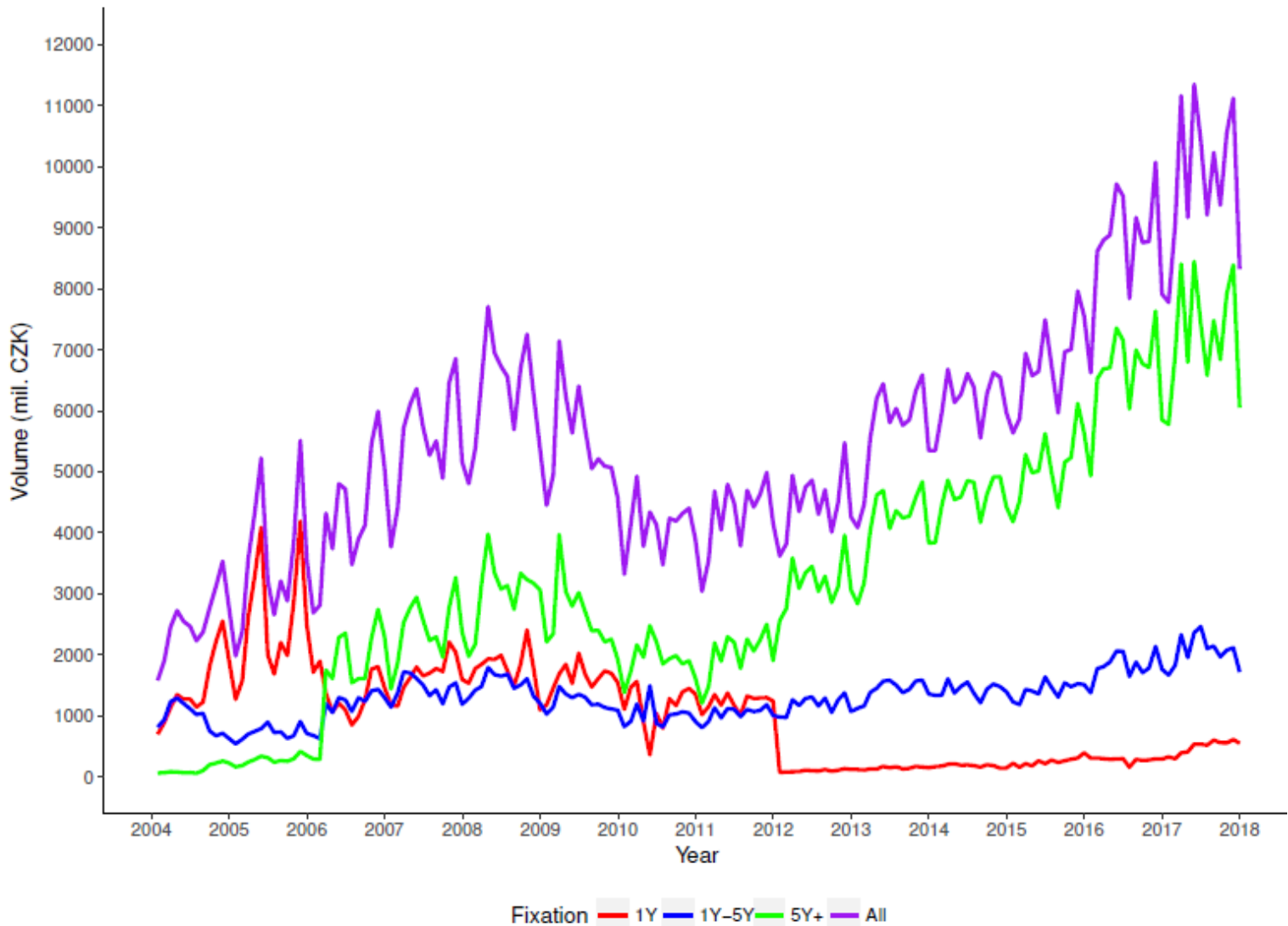
- Dimensions of the analysis:

- Mean vs. mode
- Aggregate and bank-level data
 - Not all banks in the Czech Republic provide consumer loans – we only use data on 11 banks
- Fixation categories (based on Brůha, 2011)

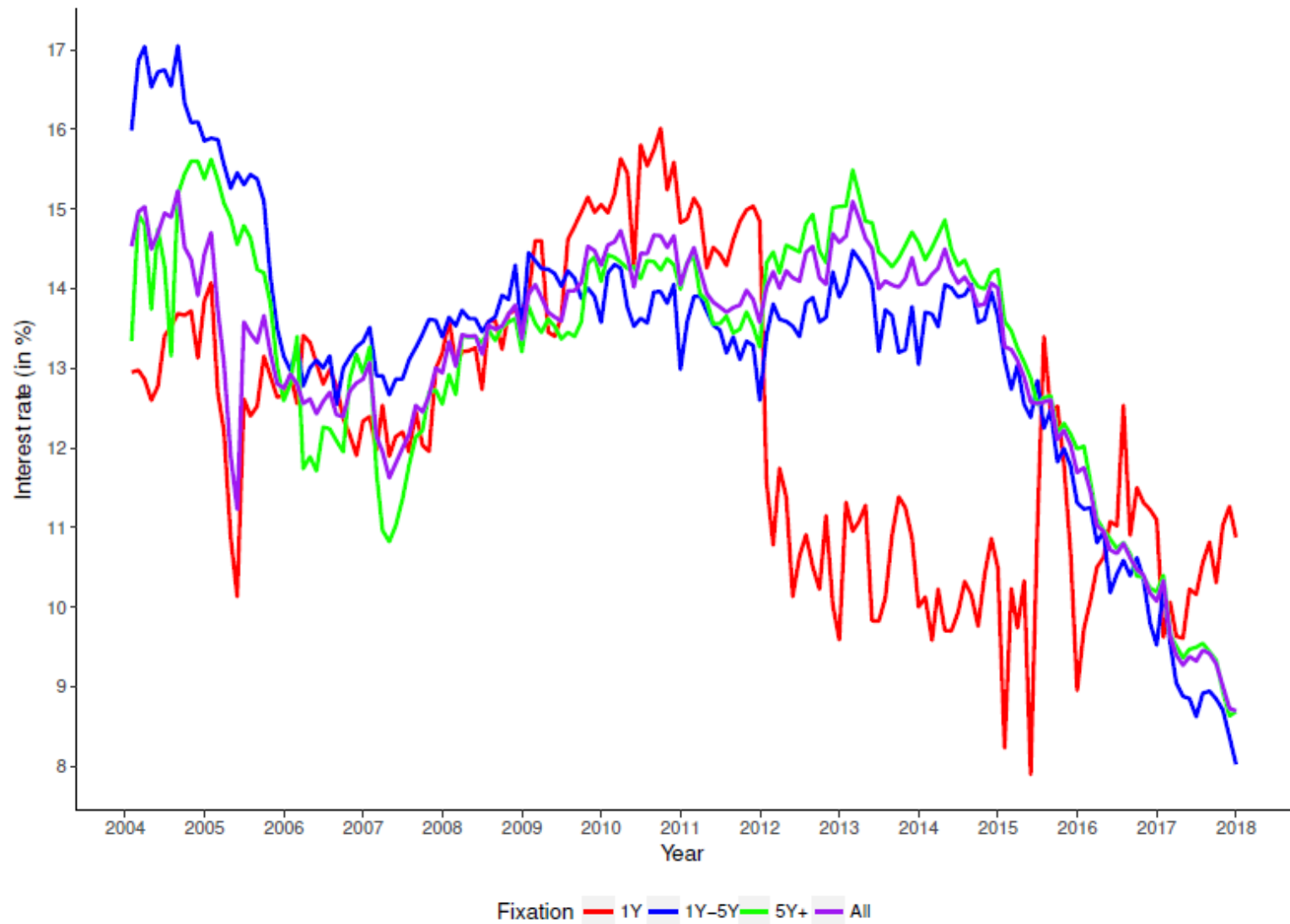


Fixation category	Market rates
Up to 1 year (“short”)	3M Pribor
1 year to 5 years (“medium”)	3Y Interest Rates Swap (IRS3Y)
Over 5 years (“long”)	7Y Interest Rates Swap (IRS7Y)

Volume: any dominant fixation category?

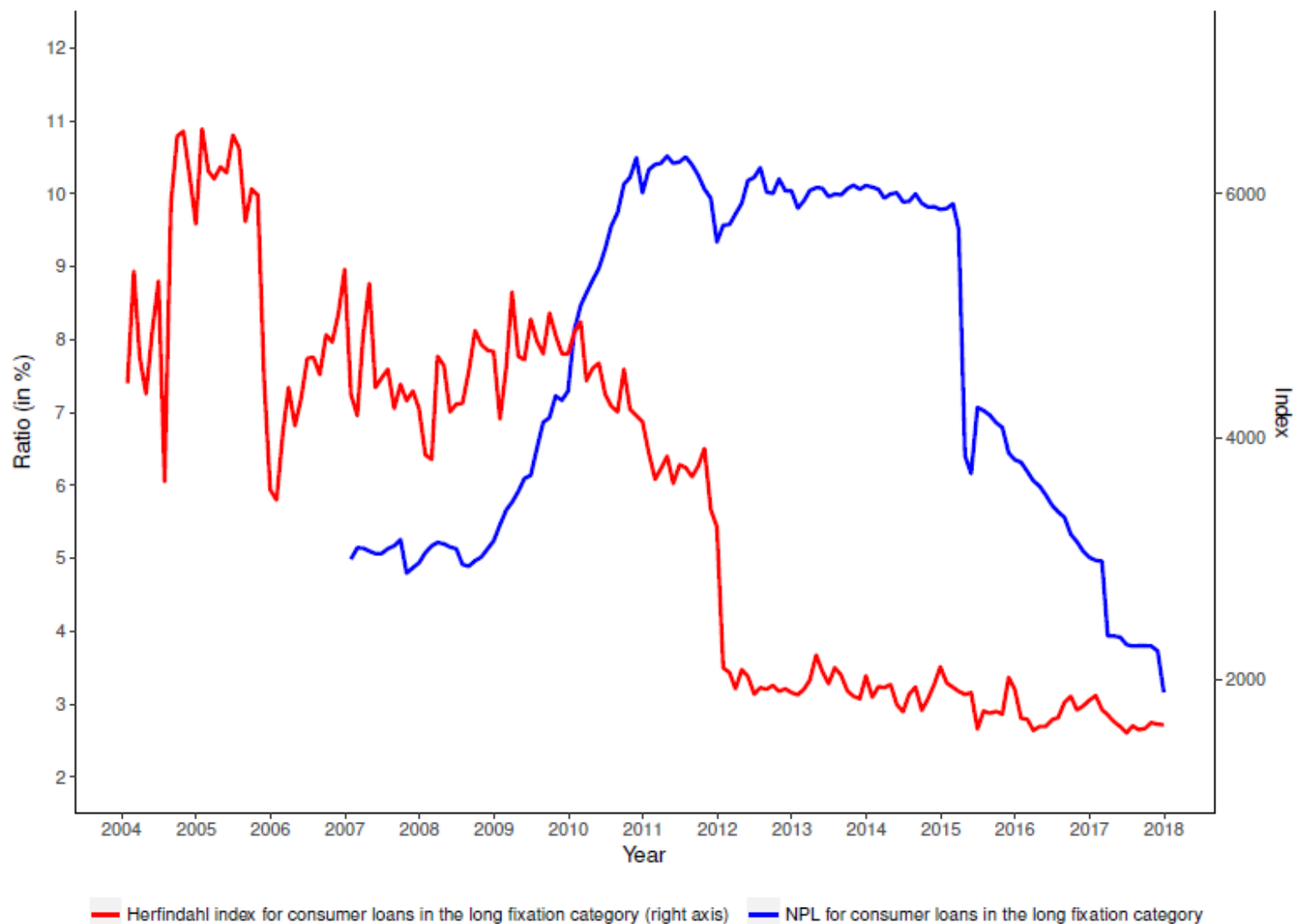


Mean interest rate: any dominant fixation category?



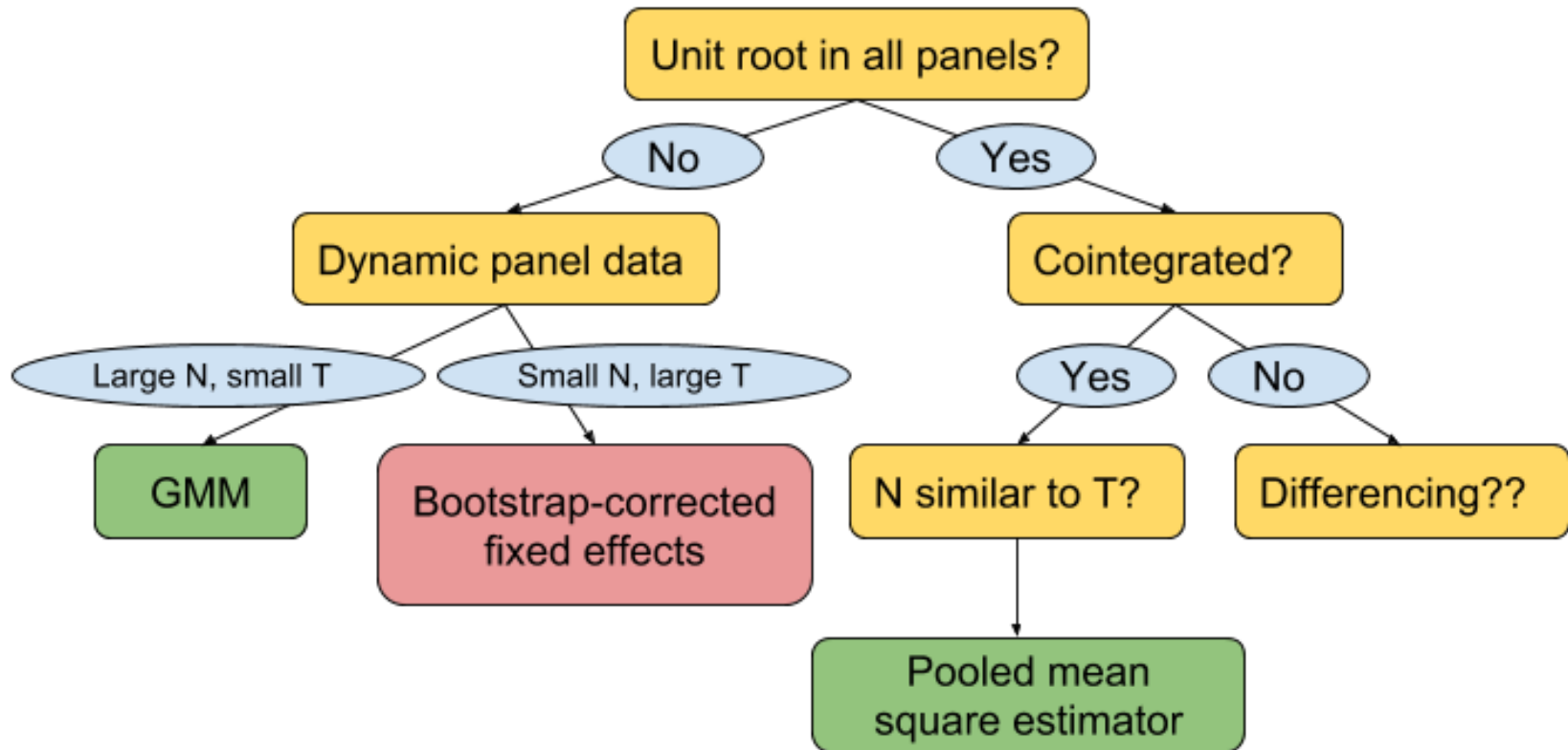
Fixation over 5 years: mean vs. mode





- Hypothesis #1: *The empirical distribution of client rates on consumer loans in the long fixation category has not shifted in recent years.*
 - Aggregate level, bank-level analysis
 - Kernel density estimation
- Hypothesis #2: *There are no statistically significant factors of client rates on consumer loans.*
 - Bank-level analysis
 - The use of the mode measure to explain distributional dynamics
 - The bootstrap-corrected fixed effect model for dynamic panel data of De Vos et al. (2015)

- The choice of the model is based on the nature of our data

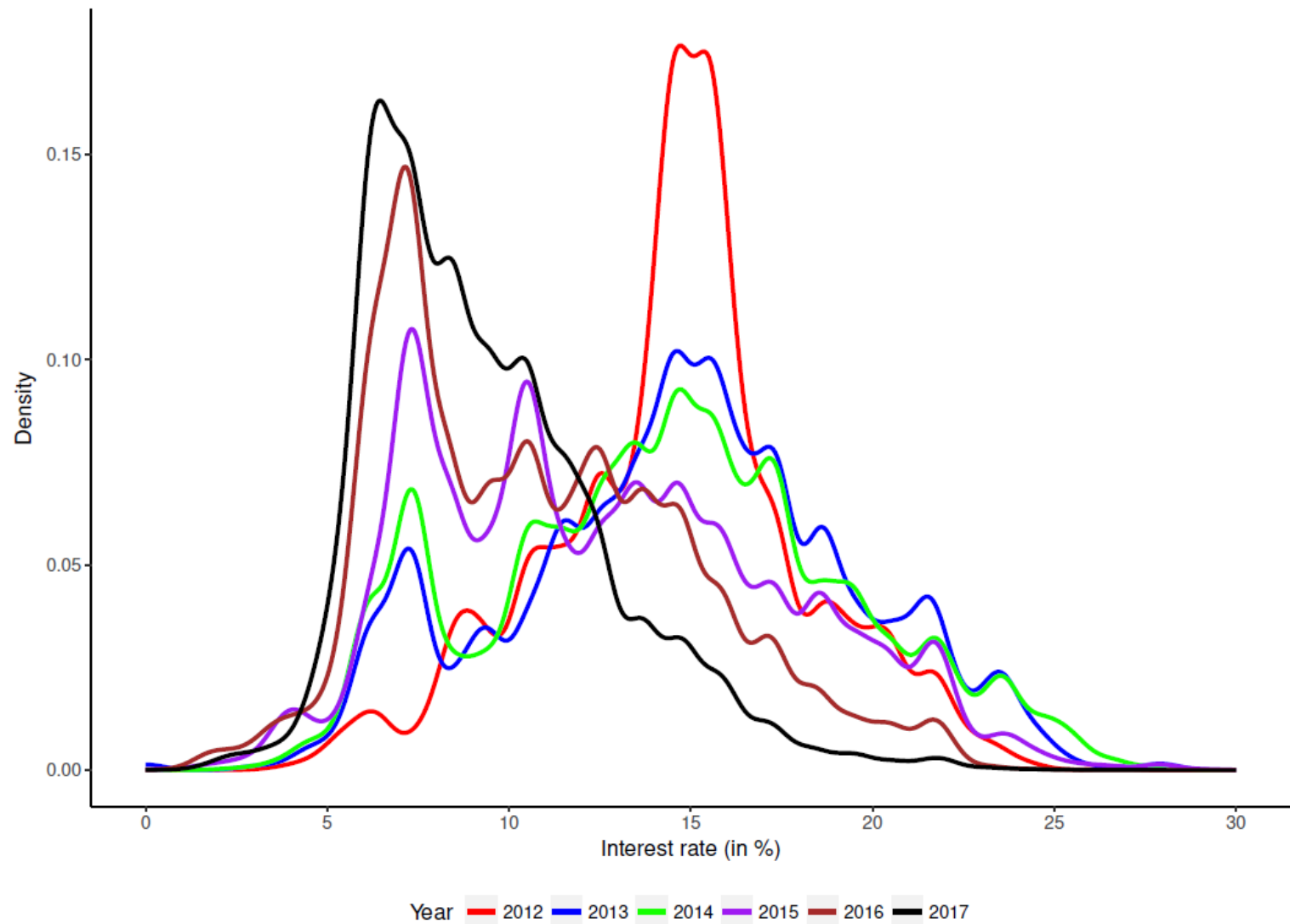


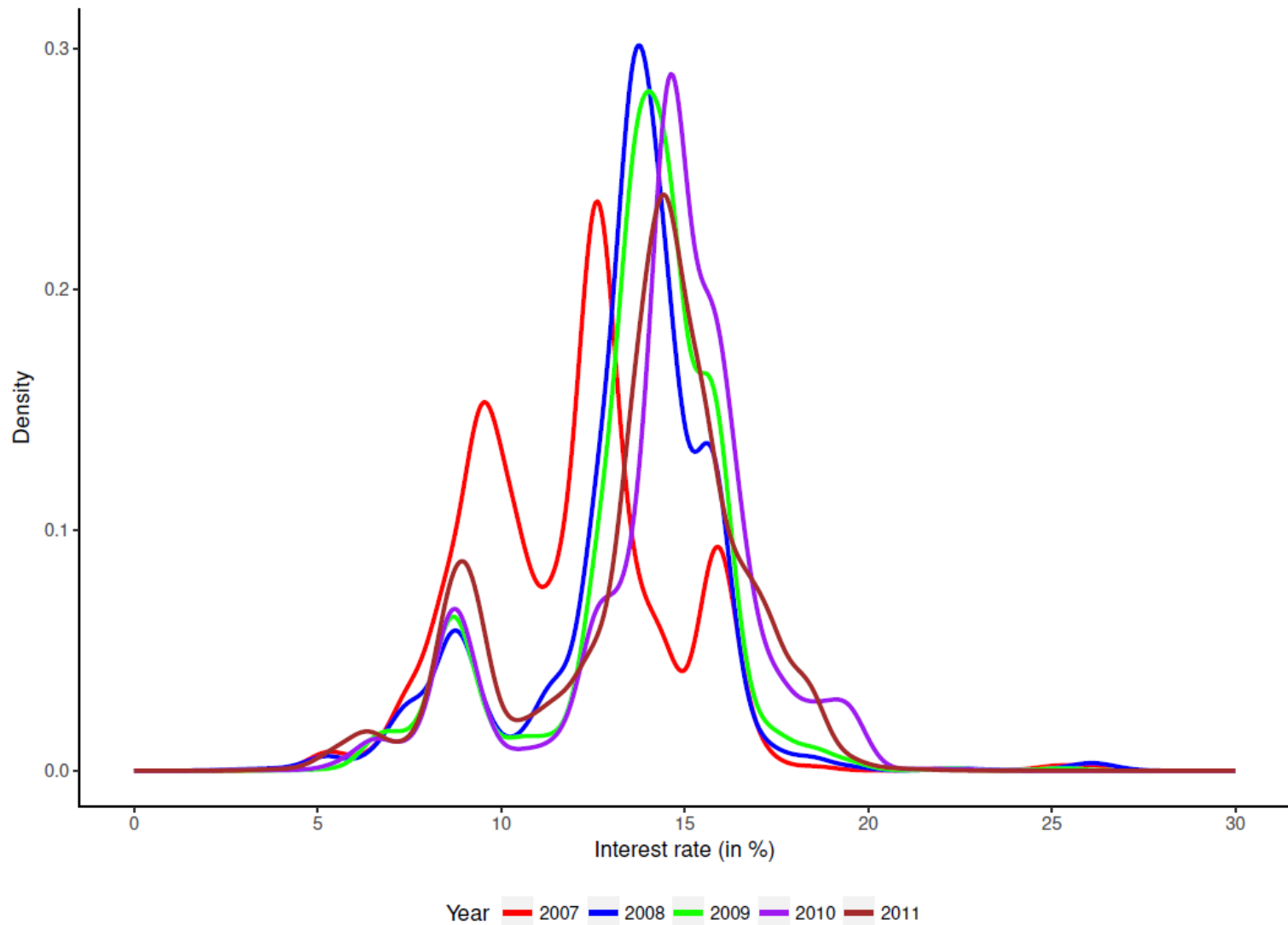
Source: based on Horváth and Podpiera (2012), Hainz et al. (2014), De Vos et al. (2015), Hayakawa (2015)

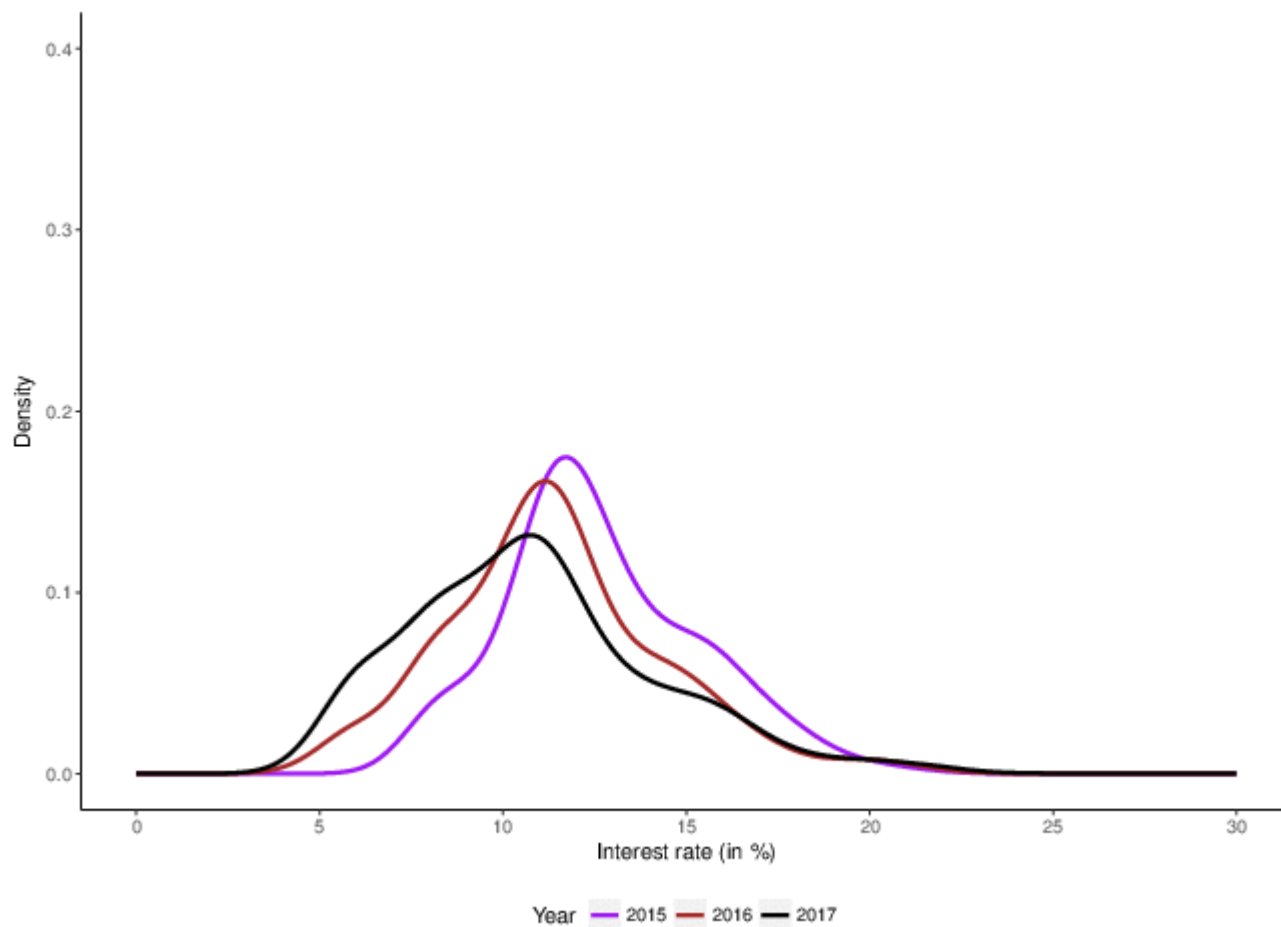
- Baseline model: to account for all (potential) factors of client rates on consumer loans identified by the literature

$$\text{consrate}_{i,t} = \alpha_i + \beta_1 \text{consrate}_{i,t-1} + \beta_2 \text{marketrate}_t + \beta_3 \text{defrate}_{i,t} + \beta_4 \text{Herfindahl}_t + \varepsilon_{i,t}$$

- *consrate* is the mean or the mode measure
- *marketrate* is the 7-year interest rate swap
- *defrate* is a proxy for credit risk
- *Herfindahl* is a proxy for market competition/concentration
- Split samples: 2007M1–2011M12; 2012M1–2017M12
 - Structural break in the series of the Herfindahl index







	(1)		(2)	
	Mean measure		Mode measure	
	Coef.	Std. err.	Coef.	Std. err.
Mean (t-1)	0.8975***	0.0384		
Mode (t-1)			0.7751***	0.0396
IRS7Y (t)	0.1614	0.1374	0.2915*	0.1739
Default rate (t)	-0.0415	0.1134	0.1896	0.1713
Herfindahl (t)	0.0572***	0.0258	0.1466***	0.0339
N. of observations	505		505	

Note: ***, **, * denote statistical significance at the 1, 5, and 10% level, respectively.

	(1)		(2)	
	Mean measure		Mode measure	
	Coef.	Std. err.	Coef.	Std. err.
Mean (t-1)	0.8014***	0.0566		
Mode (t-1)			0.6803***	0.0639
IRS7Y (t)	-0.1276	0.0957	-0.1749	0.1479
Default rate (t)	-0.0761	0.1142	-0.1230	0.1777
Herfindahl (t)	-0.0011	0.0116	0.0023	0.0197
N. of observations	281		281	

Note: ***, **, * denote statistical significance at the 1, 5, and 10% level, respectively.

- The location measures are strongly persistent in both time periods but no evidence for unit roots
- None of the factors relevant in 2007–2011
- Decreased market concentration (higher market competition) leads to lower client rates on consumer loans for both location measures in 2012–2017
 - The main factor behind distributional dynamics
 - In line with Van Leuvensteijn et al. (2013)
 - CNB (2017) reports that banks in the Czech Republic providing consumer loans have been forced to decrease their mark-ups on consumer loans since 2014

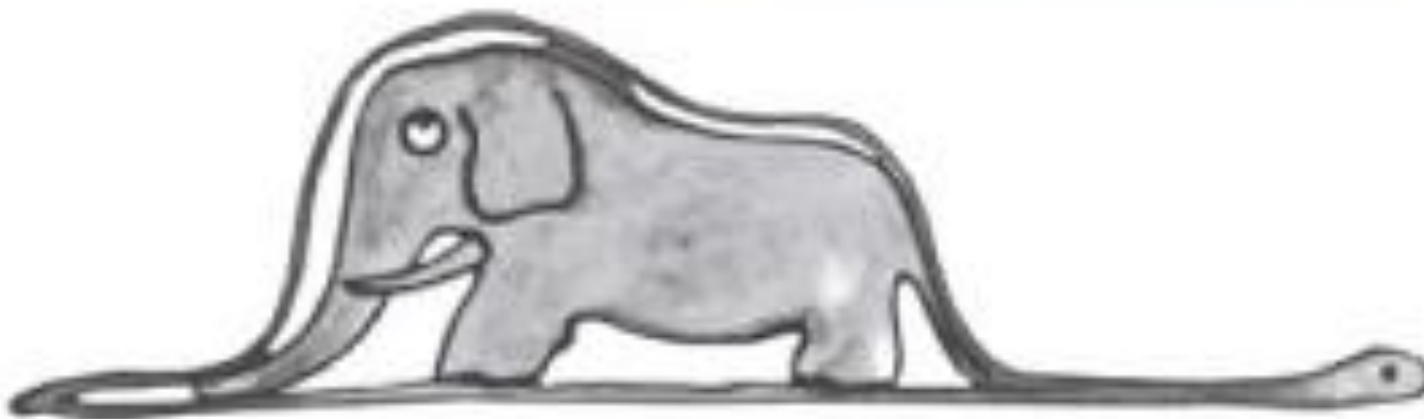
- Market rate (IRS7Y) is positively associated with the client rate on consumer loans for the mode measure in 2012–2017
 - Accommodative monetary policy might have contributed to the shifts of the distribution to lower values in recent years
 - Size of the effect
 - 0.29 – the coefficient on IRS7Y (“short-term pass-through”)
 - 0.78 – the AR coefficient -> “long-term pass-through” might be (close to) complete
 - The evidence on the short-term pass-through consistent with the literature
- Default rate not a significant factor in any regression

- GMM estimator, baseline estimation + interest rate margin on mortgages, static model
 - Increased market competition is the major driver behind the decrease in the client rates on consumer loans
 - A proxy for monetary policy also has an effect, although only for the mean measure (GMM, static model) – not a particularly robust factor
 - Interest rate margin as an additional factor behind the drop in client rates on consumer loans

- In recent years, most banks in the Czech Republic have started to provide new consumer loans with the fixation over 5 years for unprecedentedly low client interest rates
- Decreased market concentration (increased market competition) and to some extent also accommodative monetary policy and changes in the market for housing loans and mortgages behind this development
- Our results are in line with the international literature but are novel in the Czech context

- Policy
 - Unprecedented development
 - Volume increasing, rates decreasing, the distribution of rates shifting to lower values
 - Interest rate income from consumer loans poses a significant share of profits of banks in the Czech Republic
 - A continuing pressure on the mark-ups (due to increasing market competition) might be a risk for their profitability and potentially also capital adequacy
- Research
 - Take into account the term-structure dimension
 - Use distributional data if possible

Thank you for your attention



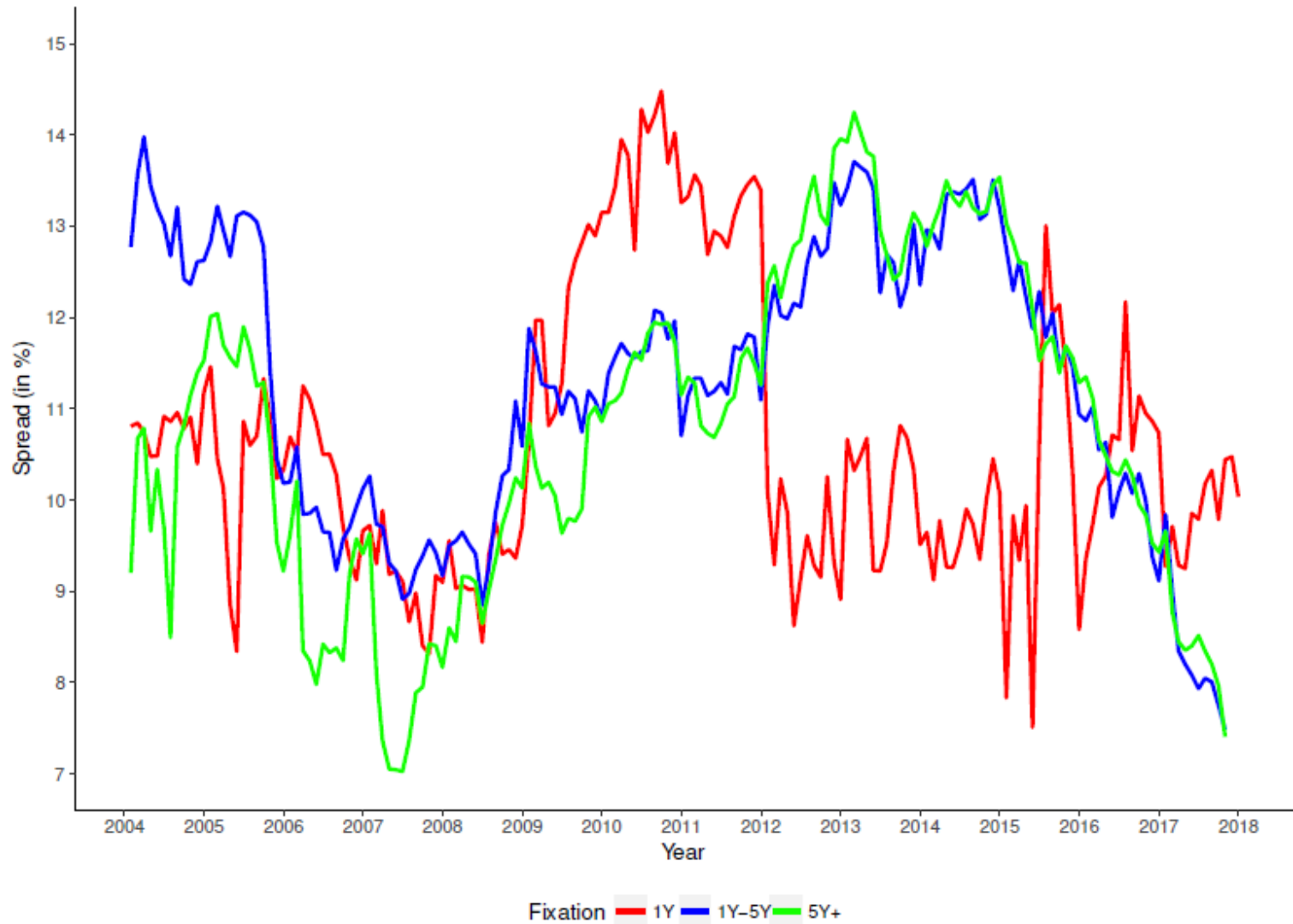
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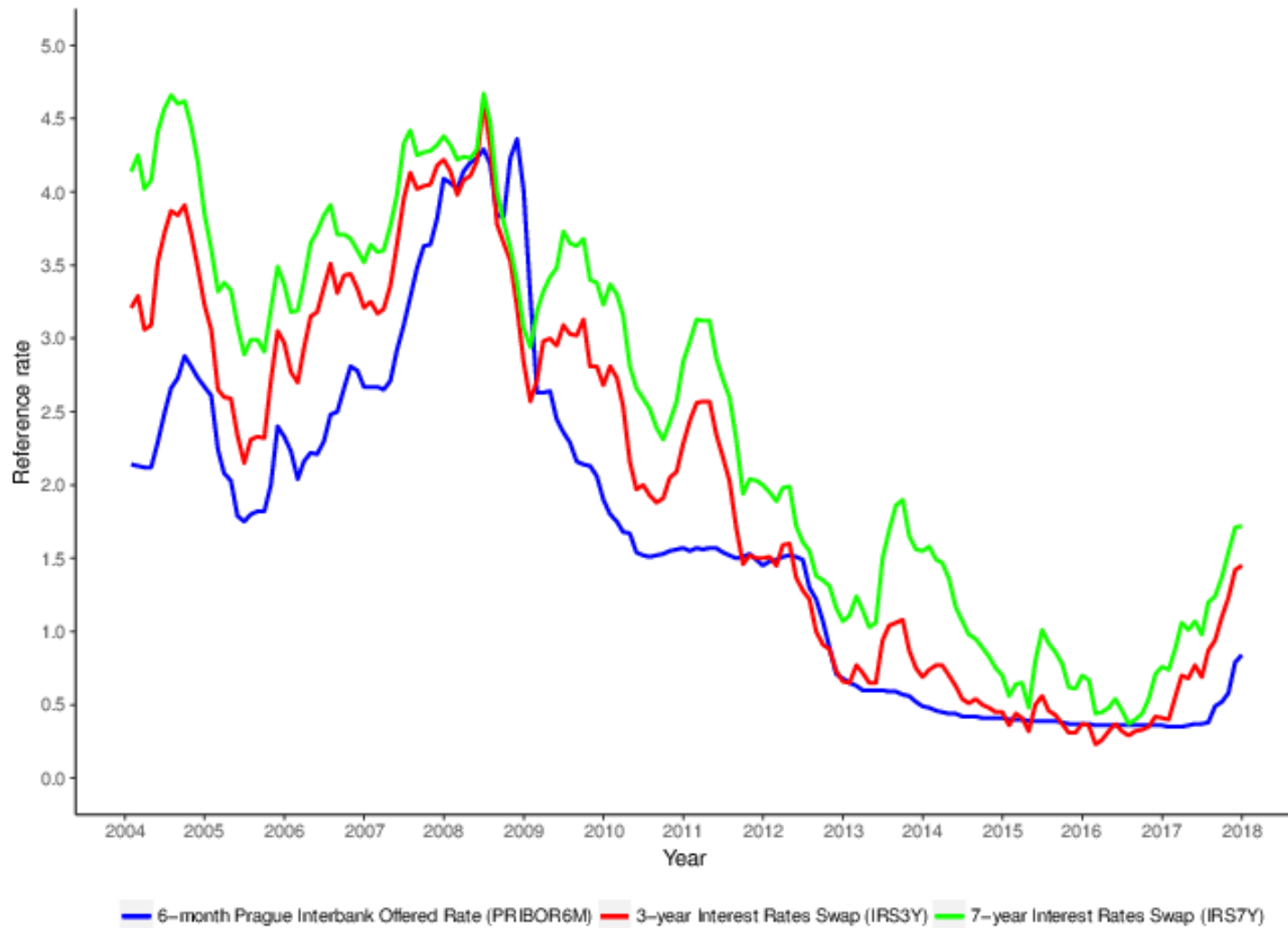
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The evolution of spreads



The evolution of market rates



	(1)		(2)	
	Mean measure		Mode measure	
	Coef.	Std. err.	Coef.	Std. err.
Mean (t-1)	0.9425***	0.0260		
Mode (t-1)			0.8077***	0.0771
IRS7Y (t)	0.3190**	0.1308	0.7497	0.6922
Default rate (t)	-0.0116	0.2524	-0.0336	0.5441
Herfindahl (t)	0.0102	0.0083	0.0451**	0.0227
N. of observations	505		505	
AR(2) test	0.121		0.240	
Hansen test	0.651		0.423	

Note: ***, **, * denote statistical significance at the 1, 5, and 10% level, respectively.

	(1)		(2)	
	Mean measure		Mode measure	
	Coef.	Std. err.	Coef.	Std. err.
Mean (t-1)	0.8964***	0.0377		
Mode (t-1)			0.7759***	0.0390
IRS7Y (t)	0.1331	0.1378	0.2181	0.1781
Default rate (t)	-0.0585	0.1147	0.1488	0.1726
Herfindahl (t)	0.0621**	0.0266	0.1589***	0.0352
Margin (t, difference)	0.5943	0.3980	1.5001***	0.5423
N. of observations	505		505	

Note: ***, **, * denote statistical significance at the 1, 5, and 10% level, respectively. The estimation method is the bootstrap-corrected least squares estimator of De Vos et al. (2015).

	(1)		(2)	
	Mean measure		Mode measure	
	Coef.	Std. err.	Coef.	Std. err.
IRS7Y (t)	1.2526*	0.6237	1.5500	1.0050
Default rate (t)	0.0997	0.2187	0.3131	0.2416
Herfindahl (t)	0.2758***	0.0619	0.4392**	0.1480
N. of observations	515		515	

Note: ***, **, * denote statistical significance at the 1, 5, and 10% level, respectively.

	(1)		(2)	
	Mean measure		Mode measure	
	Coef.	Std. err.	Coef.	Std. err.
IRS7Y (t)	1.2927**	0.5640	1.6028	0.9367
Default rate (t)	0.0511	0.2994	0.3311	0.2776
Herfindahl (t)	0.2860***	0.0573	0.4497**	0.1509
Margin (t, difference)	0.3114	1.2566	0.2547	1.7196
N. of observations	515		515	

Note: ***, **, * denote statistical significance at the 1, 5, and 10% level, respectively.

2018?

