FX Interventions Rules for Central Banks
A Risk-Based Framework

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Contributions

- Design a rule for central banks that intervene to prevent **disorderly market conditions**
- Provides guidance on **when** to intervene ("triggers")
- Appropriate for **floating exchange rate regimes** with FX risks to the economy (e.g. FX unhedged exposures)
- Consistenty control **FX risk** rather than arbitrary FX volatility/level threshold
- A **risk management framework** for central banks' financial stability mandate: aligned with **industry's best practices** in FX management

What the rule is NOT about

- Not designed to reach or to preserve a given FX level (e.g. the **equilibrium exchange rate level**)
- Doesn't prevent **appreciation/depreciation trends** to occur...
- ... but can be compatible with other approaches, e.g. discretionary FXI
- We **don't discuss the efficiency** of FX interventions from a welfare/macro point of view
- Not a guide to calibrate **FX interventions amount**
- Not a guide for the optimal **currency allocation** of FX reserves

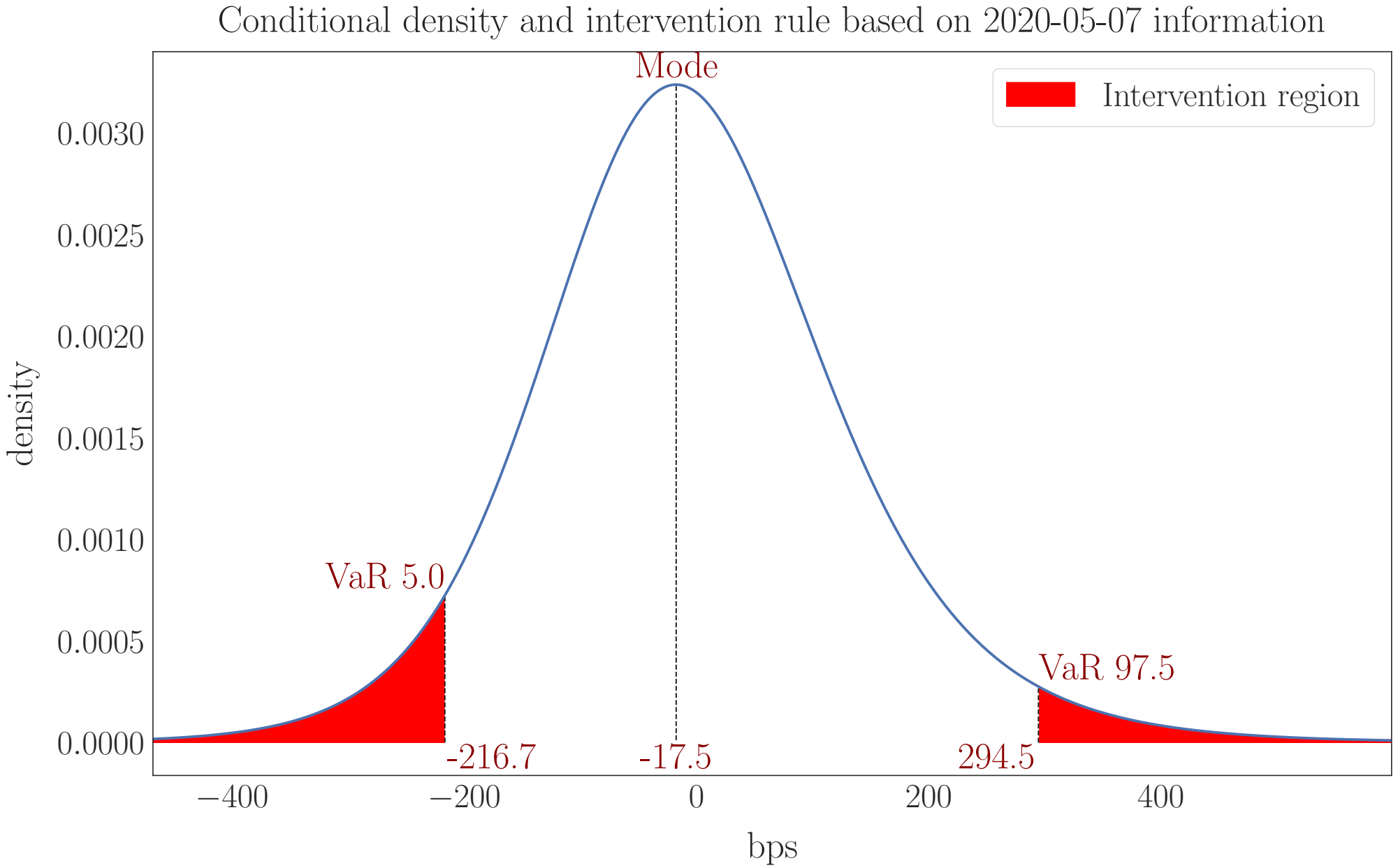
Key Messages

Foreign Exchange intervention rules should

- Depend on market conditions
- Objective, be anchored to a risk tolerance level rather than an aribtrary FX level threshold
- Capture FX non-linearities and asymmetries between appreciation and depreciation
- Be forward-looking
- Be easily operationalizable

We propose an FX intervention rule based on **Conditional Value-at-Risk**

VaR FXI Rule


Conditional density and intervention rule based on 2020-05-07 information
Mode
Intervention region
VaR 5.0
VaR 97.5
-216.7
-17.5
294.5
density
0.0030
0.0025
0.0020
0.0015
0.0010
0.0005
0.0000
−400
−200
0
200
400
bps

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Regression Table

	Constant	Microstructure	CIP	FXI	Baseline	Robustness
Intercept	1.09	-2.16	2.15	1.67***	1.63	1.64***
Lag FX log returns	0.09***	0.08***	0.08***	0.08***	0.08***	0.08***
Bid-ask spread abs value		0.11**	0.15***	0.14***	0.15***	0.15***
Forward points first difference		0.32***	0.32***	0.32***	0.27***	0.27***
Interbank rate vs Libor			-1.11***	-0.98***	-1.02***	-1.03***
FX intervention in USD lag				0.04	0.04	
VIX first diff					9.78***	9.79***
EURUSD log returns					0.13***	0.13***
FX intervention dummy lag						4.13
Omega	0.15***	0.14***	0.13***	0.13***	0.14***	0.14***
Alpha	0.17***	0.19***	0.18***	0.18***	0.19***	0.19***
Gamma	0.06***	0.06***	0.06***	0.05***	0.05***	0.05***
Beta	0.98***	0.98***	0.98***	0.99***	0.98***	0.98***
Nu	8.81***	9.11***	9.18***	9.15***	7.77***	7.77***
Lambda	0.13***	0.11***	0.12***	0.12***	0.1***	0.1***
R2	0.4 %	4.9 %	5.1 %	5.1 %	14.3 %	14.3 %
R2 adjusted	0.4 %	4.8 %	5.0 %	5.0 %	14.2 %	14.1 %
Number of observations	4511	4511	4511	4510	4510	4510
Significance *10%, **5%, ***1%						

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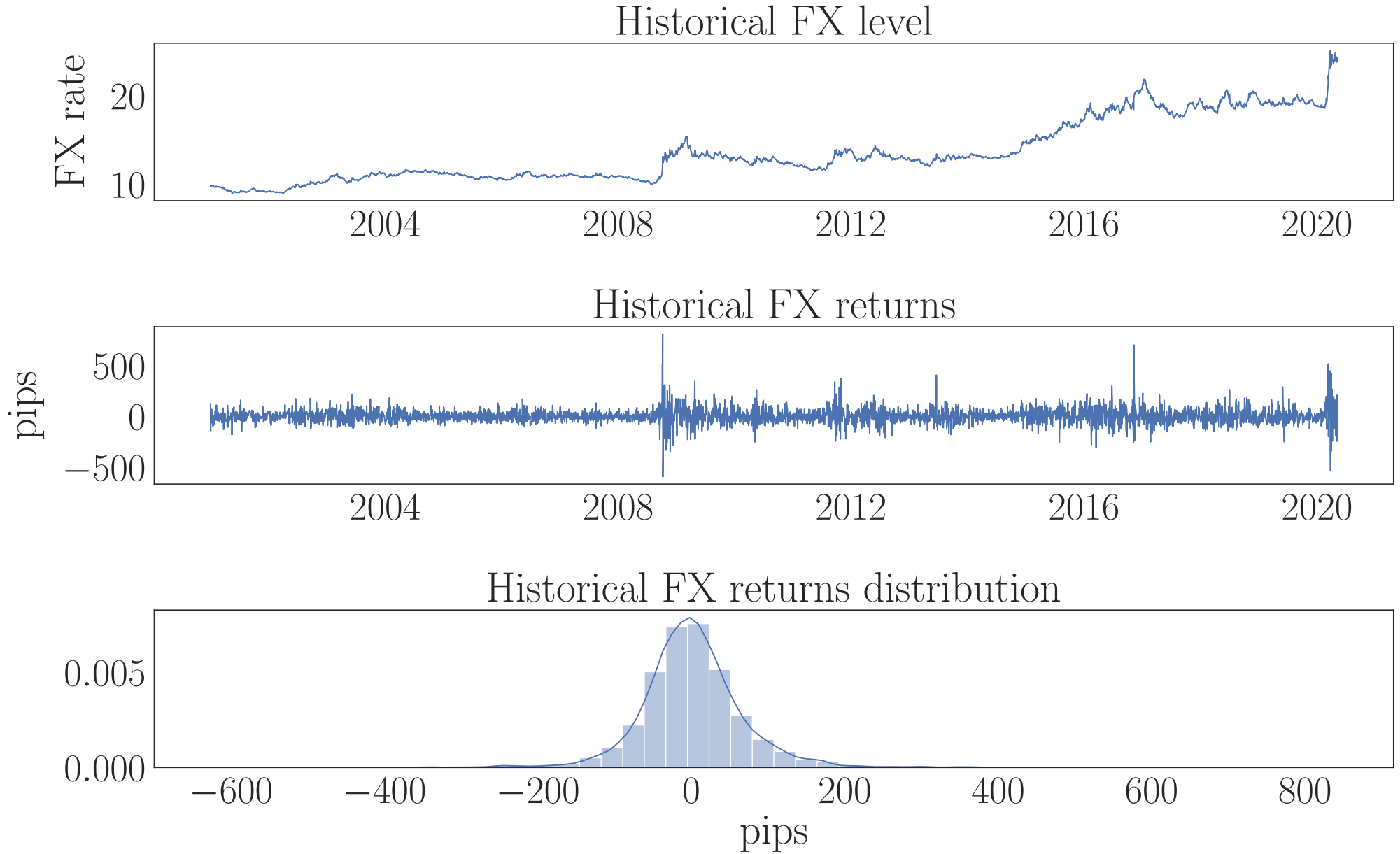
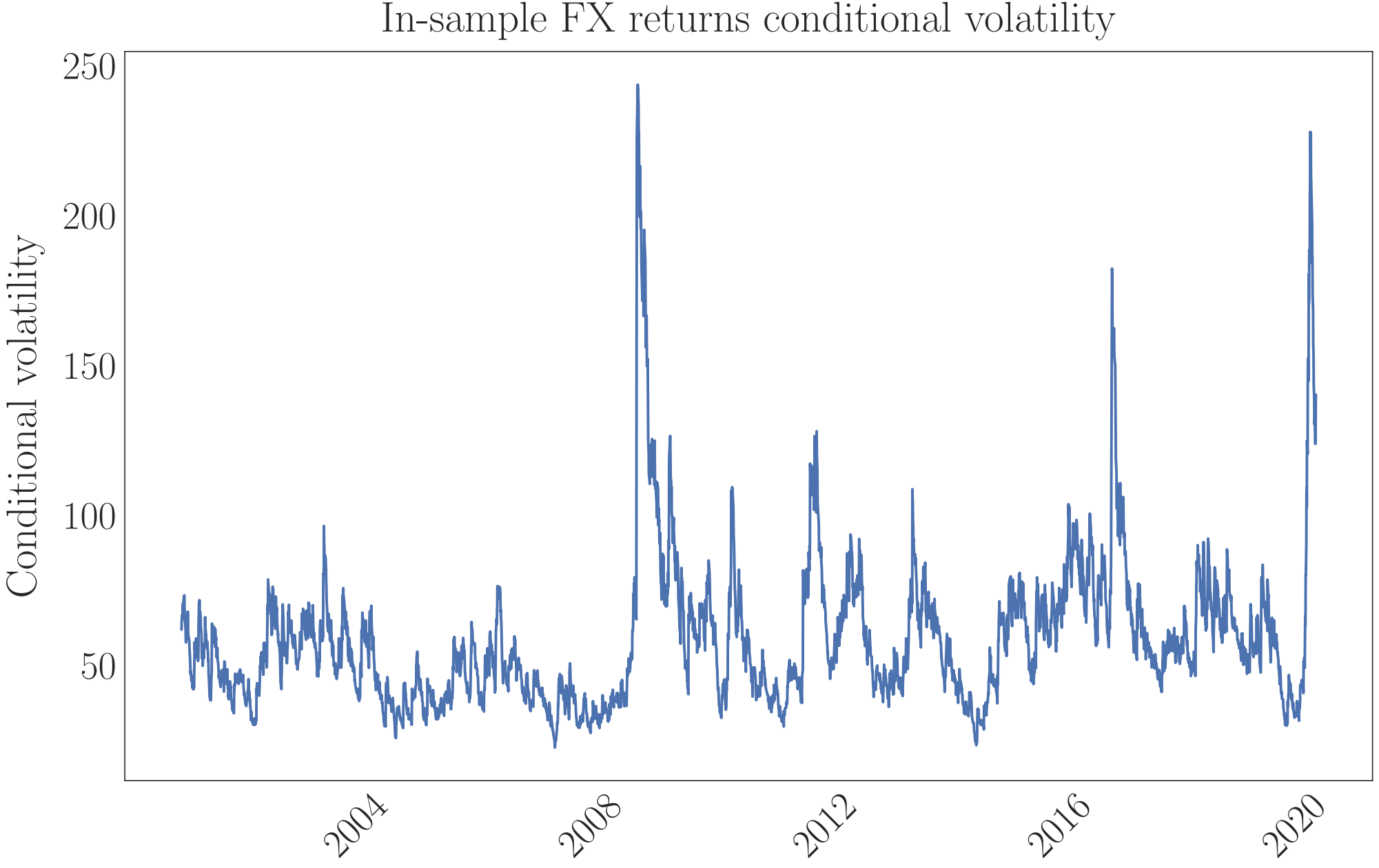
Dynamics of the Mexican Peso against USD



Conditional In-Sample Volatility of the Mexican Peso



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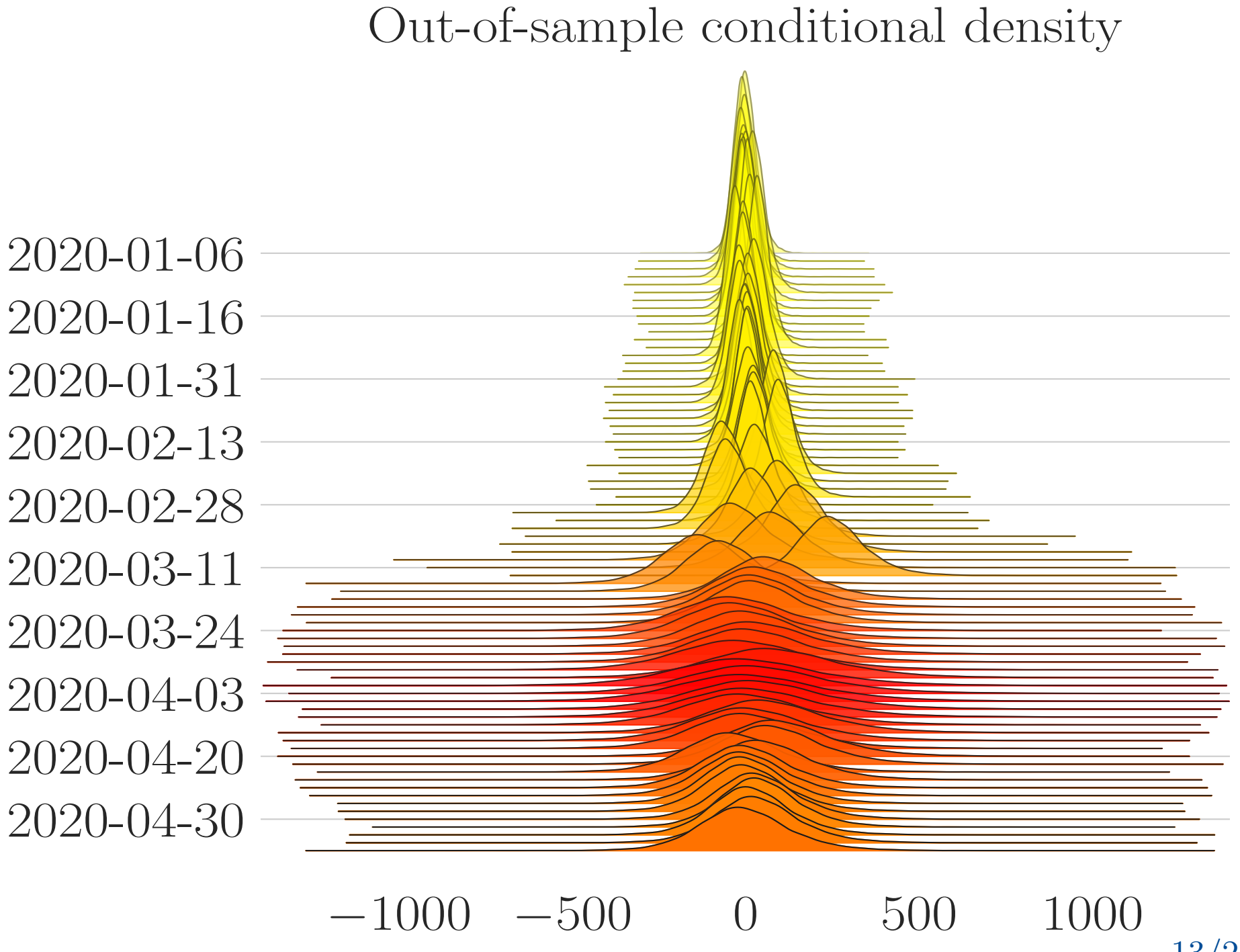
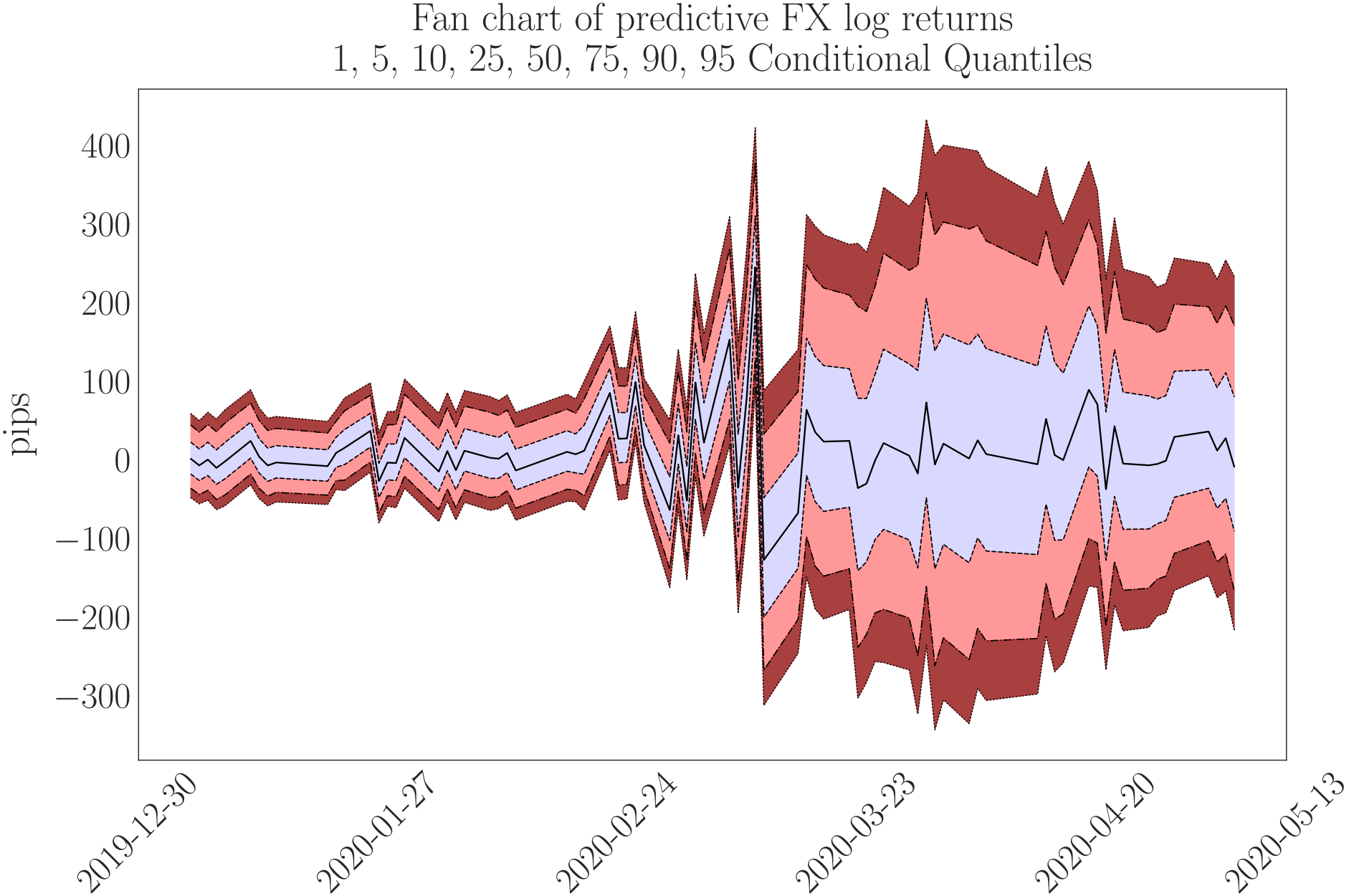
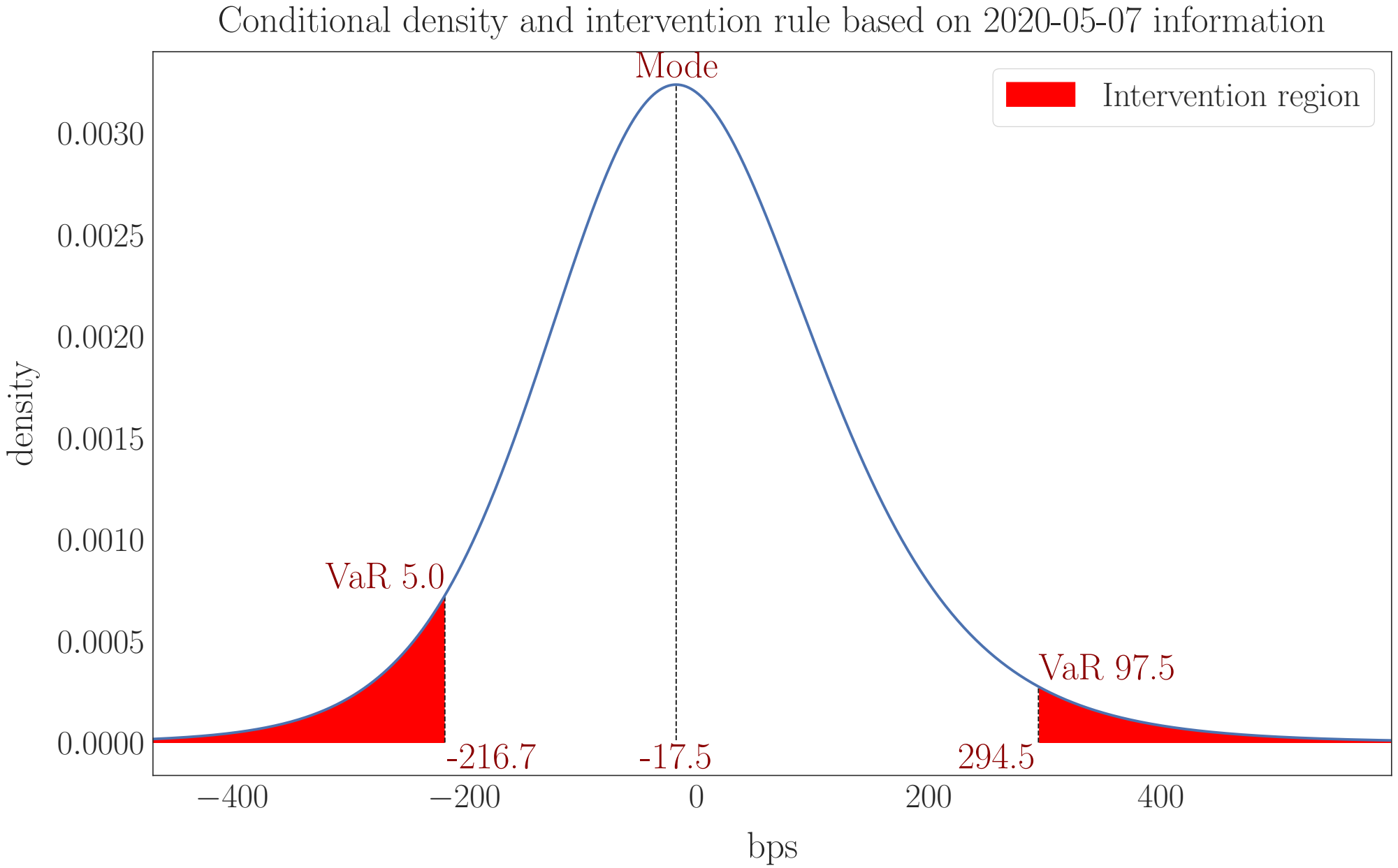

Out-of-sample conditional density
2020-01-06
2020-01-16
2020-01-31
2020-02-13
2020-02-28
2020-03-11
2020-03-24
2020-04-03
2020-04-20
2020-04-30
−1000
−500
0
500
1000

Fan Chart


Fan chart of predictive FX log returns
1, 5, 10, 25, 50, 75, 90, 95 Conditional Quantiles
pips
400
300
200
100
0
−100
−200
−300
2019-12-30
2020-01-27
2020-02-24
2020-03-23
2020-04-20
2020-05-13

VaR FXI Rule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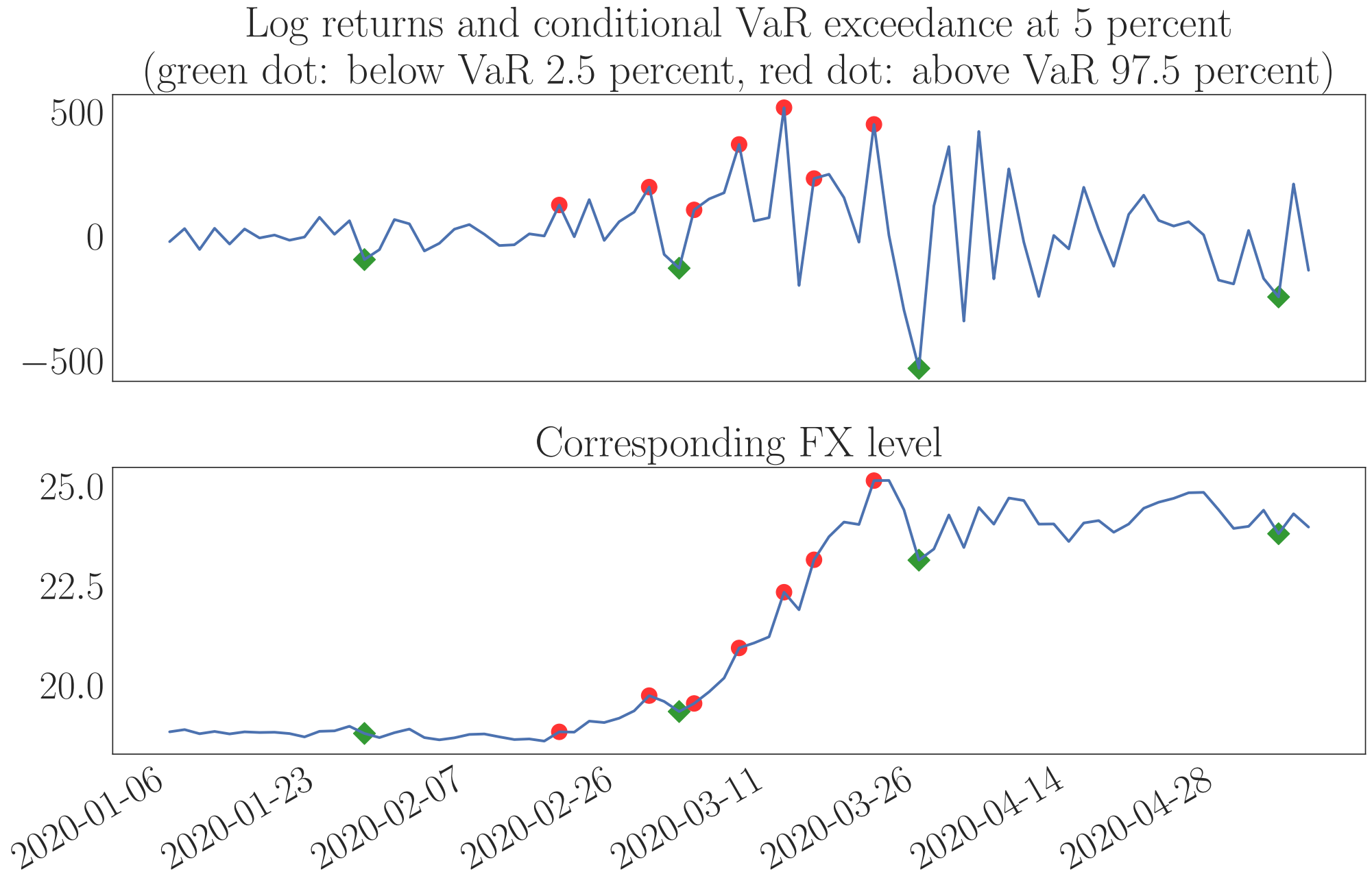
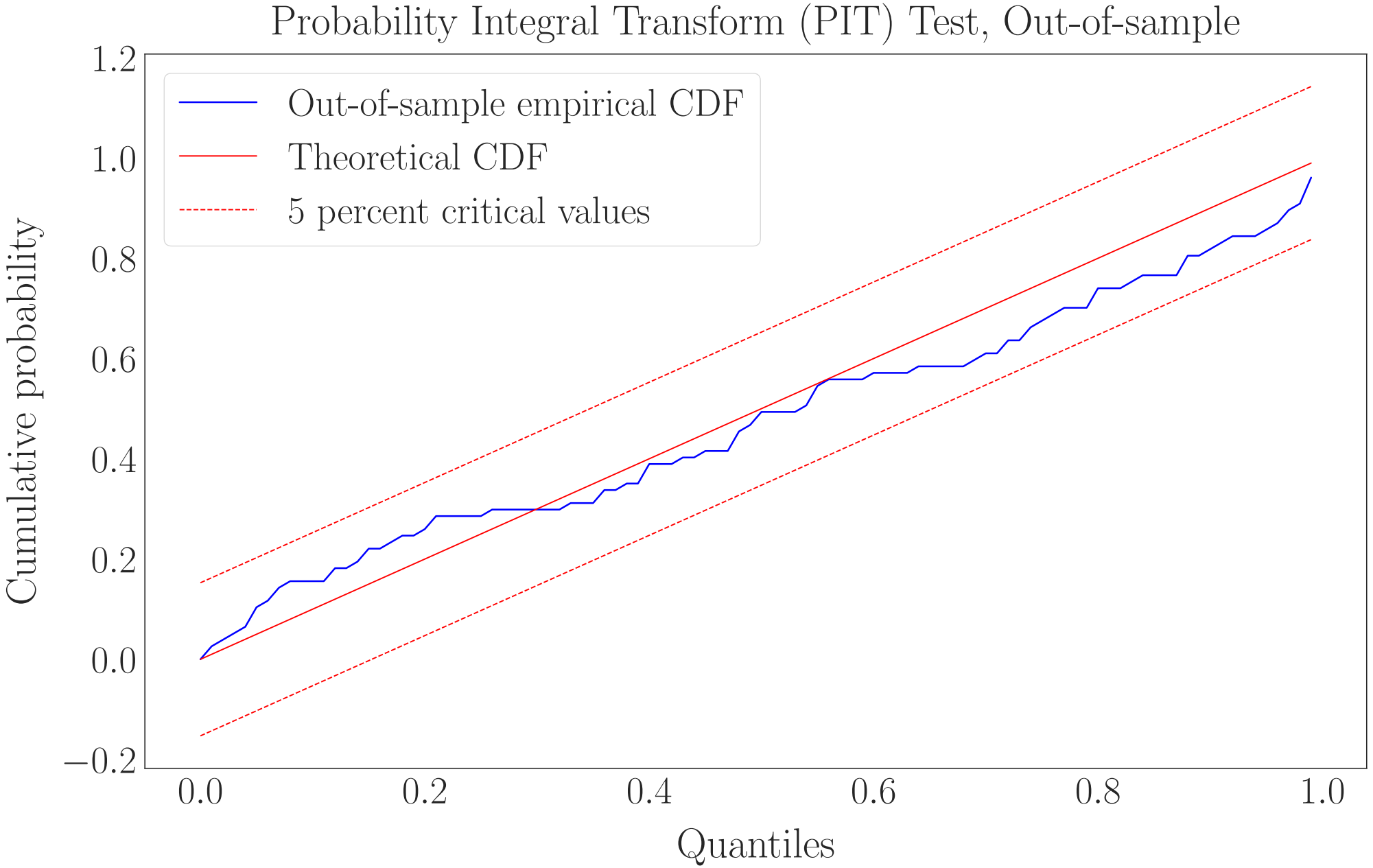
0.0015
0.0010
0.0005
0.0000
−400
−200
0
200
400
bps

Conditional Cumulative Distribution Function

Conditional Exceedance



Density Evaluation



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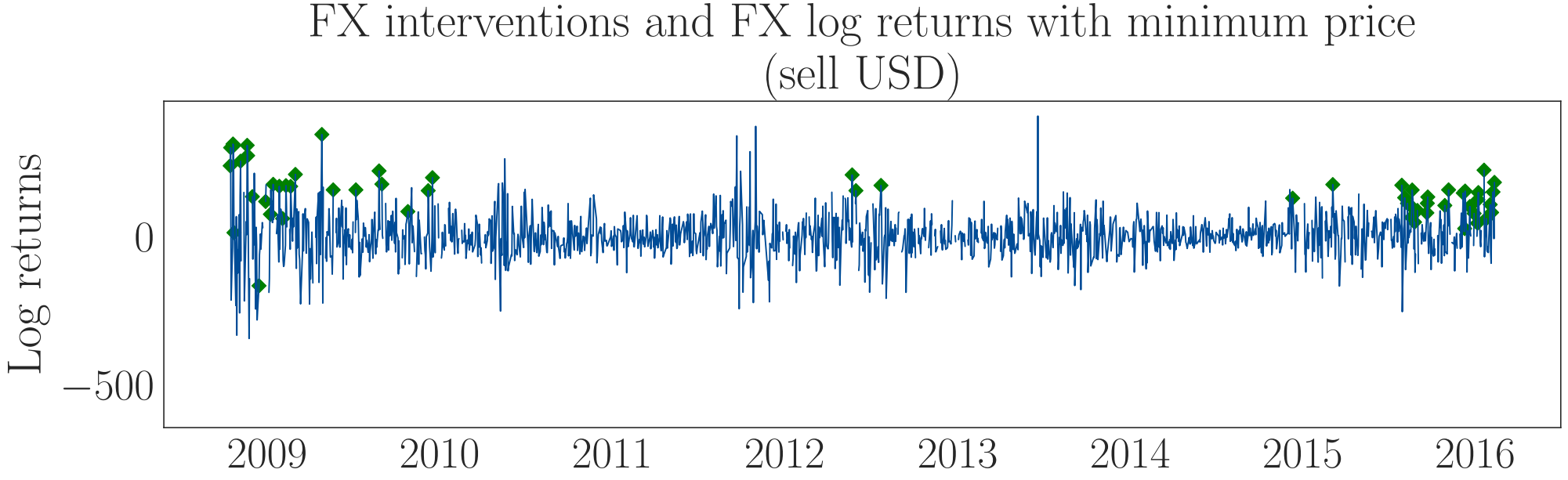
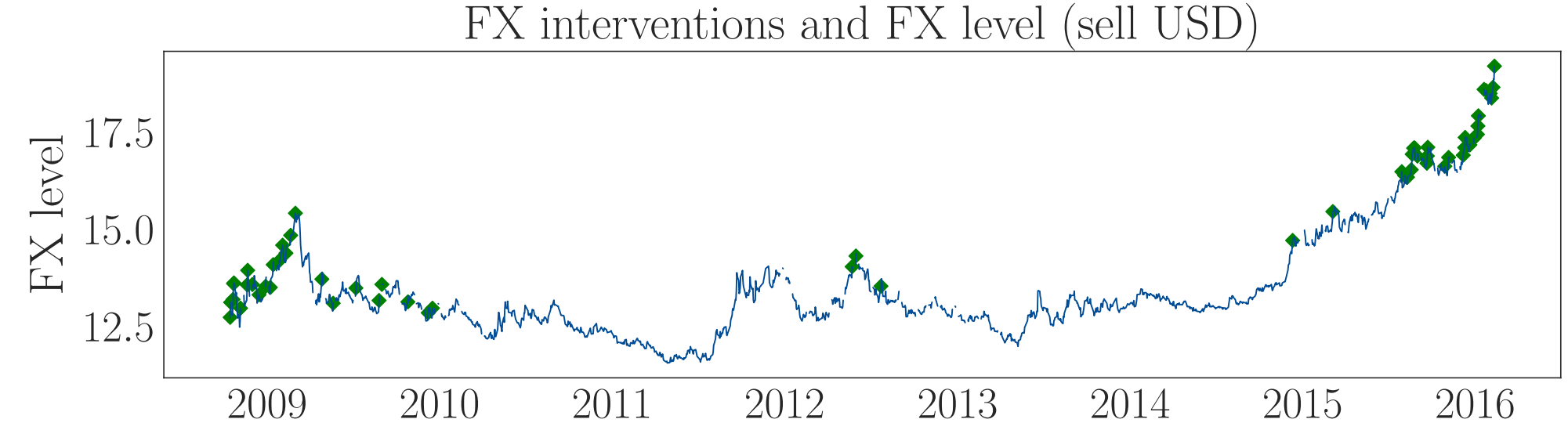
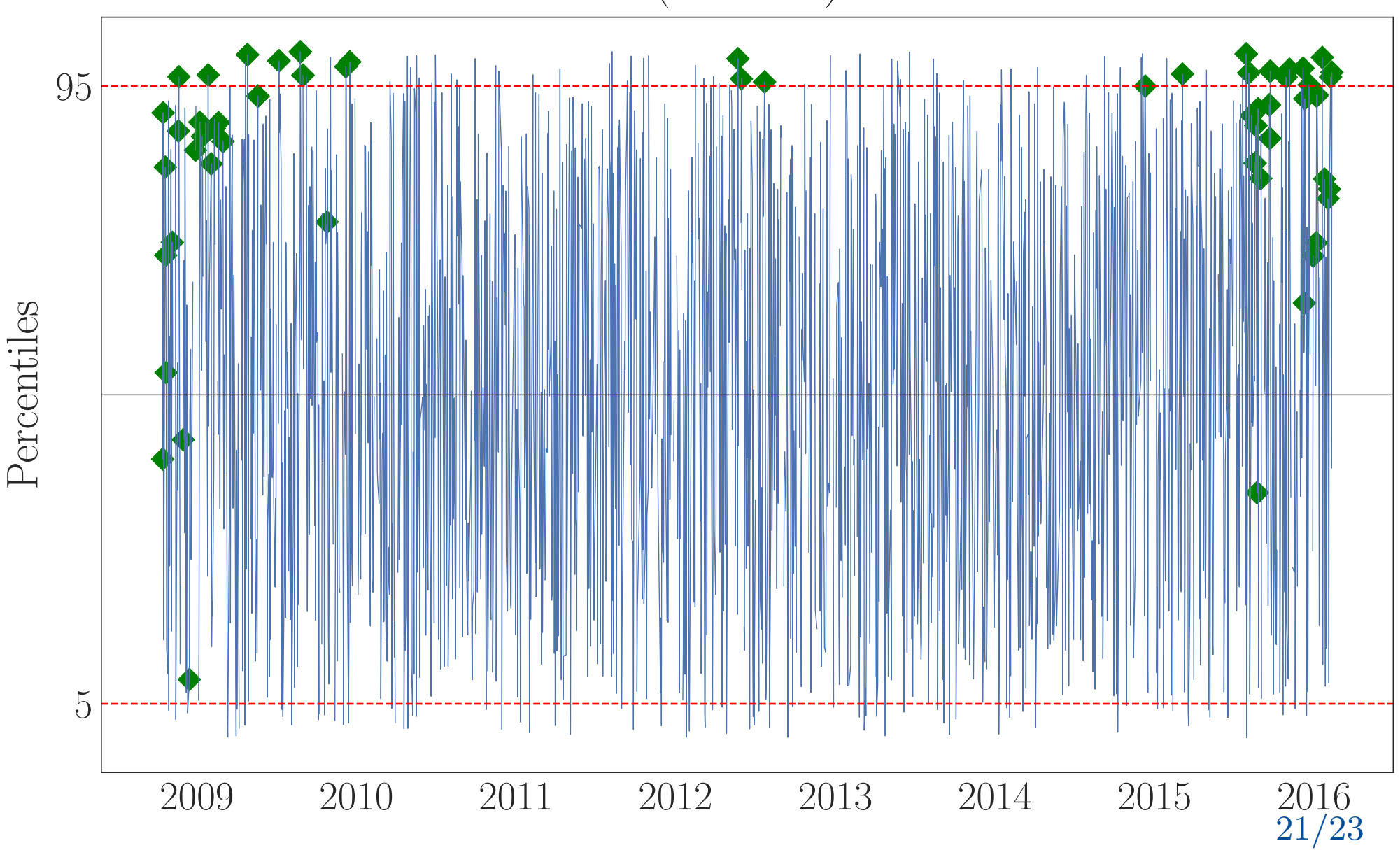
Rule-Based Benchmarking: Historical Interventions

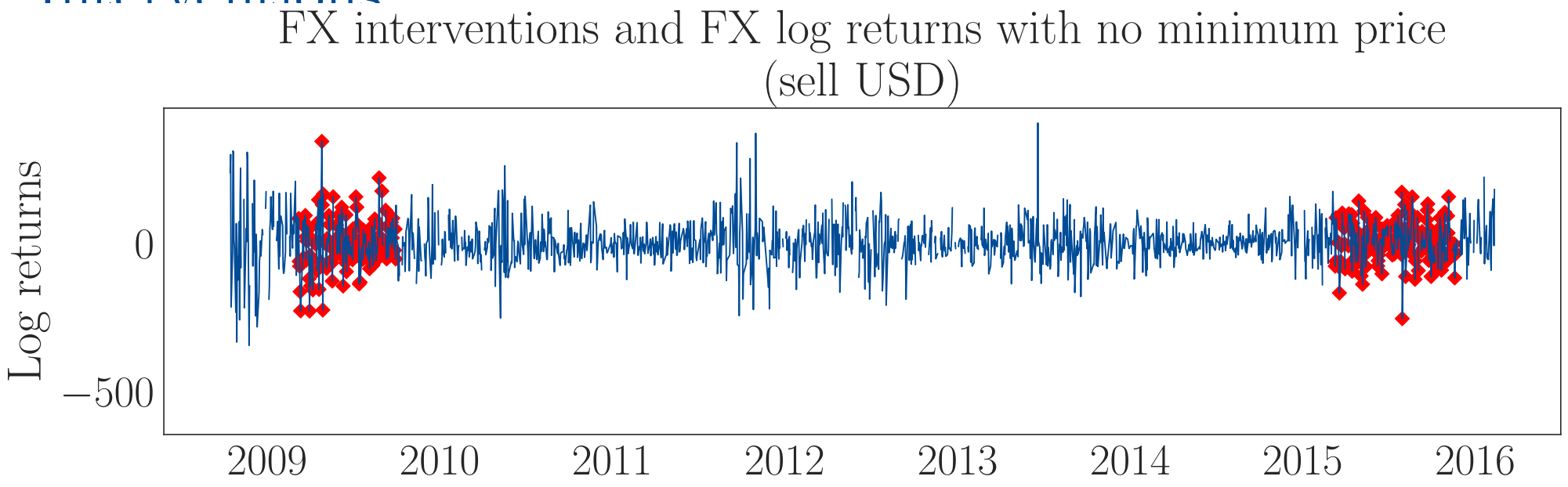


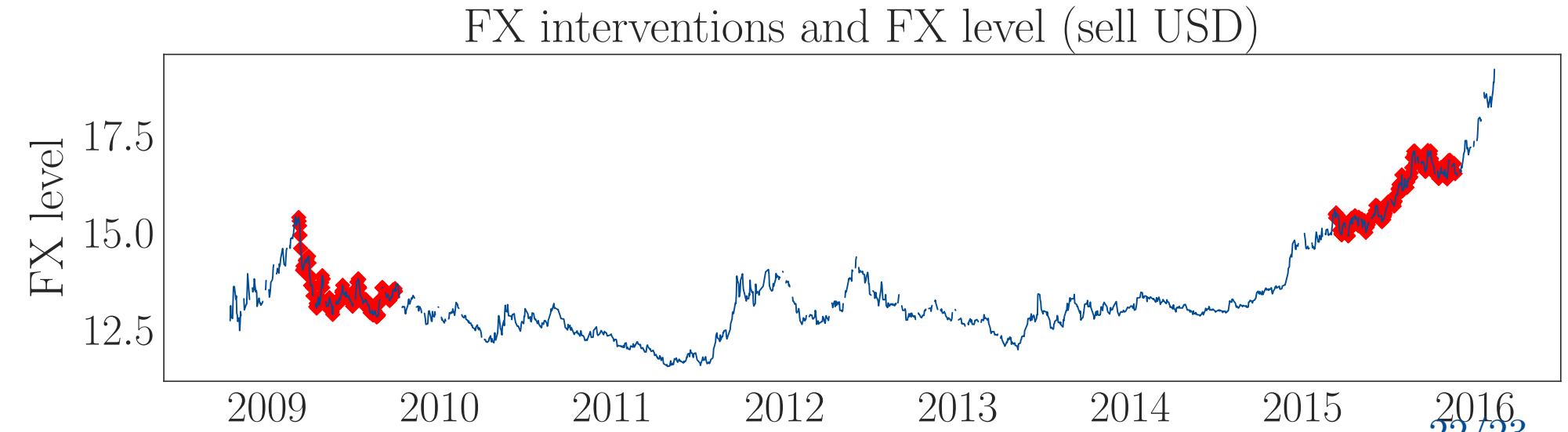


Rule-Based Benchmarking: Risk-Level



Discretion-Based Benchmarking: Historical Interventions





Discretion-Based Benchmarking: Risk-Level