

## Exchange Rate Drivers in Emerging Markets amid the First Wave of the Covid-19 Pandemic

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Workshop on The Impact of Economic Integration on Regional Business Cycles Synchronization

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# Agenda

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7	<b>Robustness</b>
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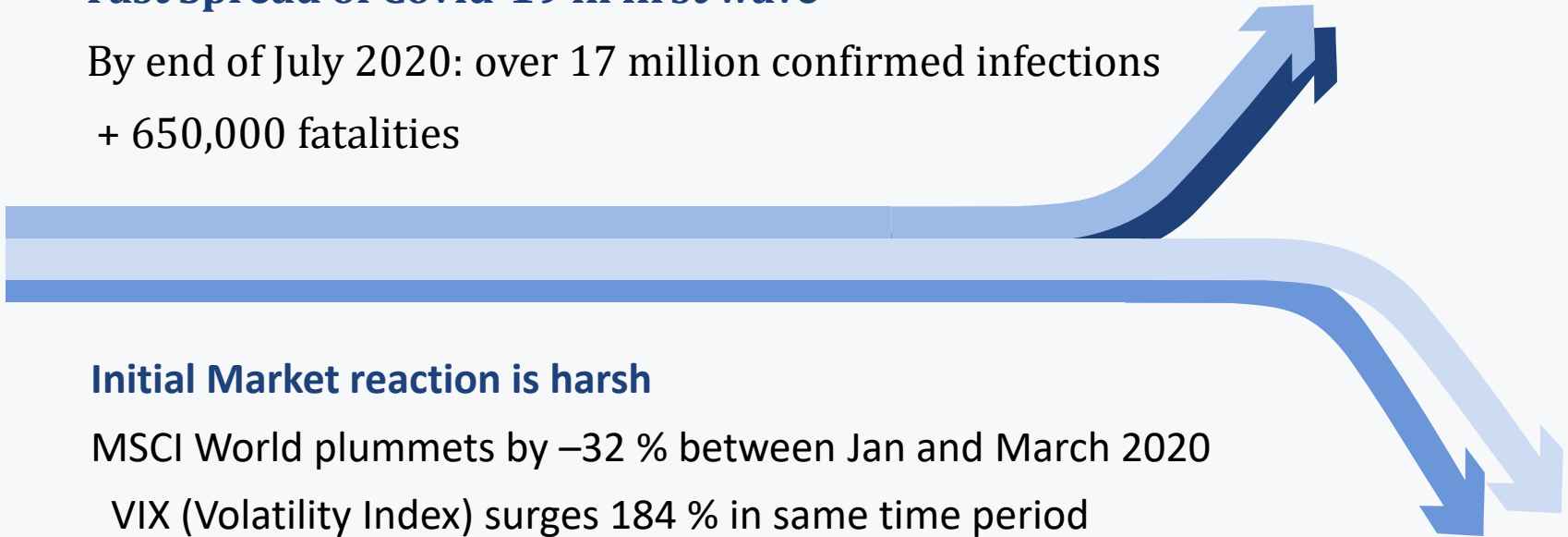
# Relevance

## Fast Spread of Covid-19 in first wave

By end of July 2020: over 17 million confirmed infections  
+ 650,000 fatalities

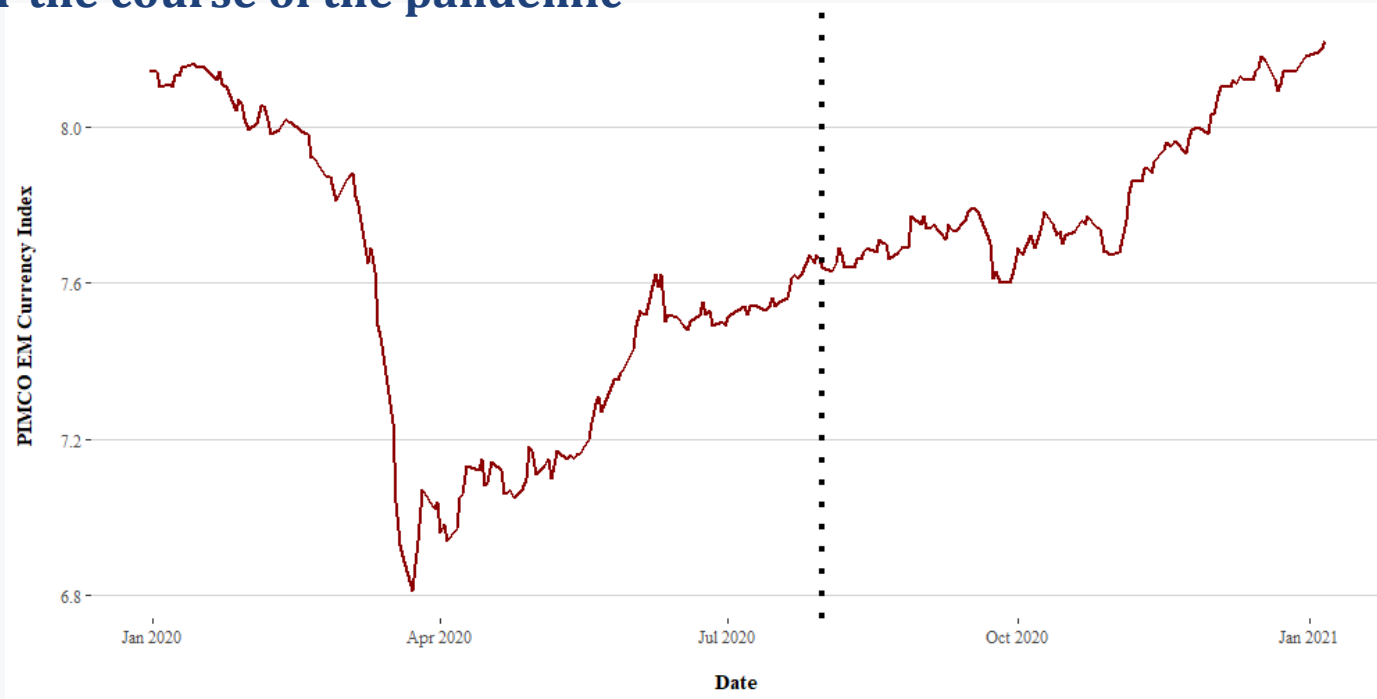
## Initial Market reaction is harsh

MSCI World plummets by  $-32\%$  between Jan and March 2020  
VIX (Volatility Index) surges  $184\%$  in same time period



# EM Exchange Rates

Over the course of the pandemic



# Relevance

## EM particularly hit hard

High output costs

Large capital outflows

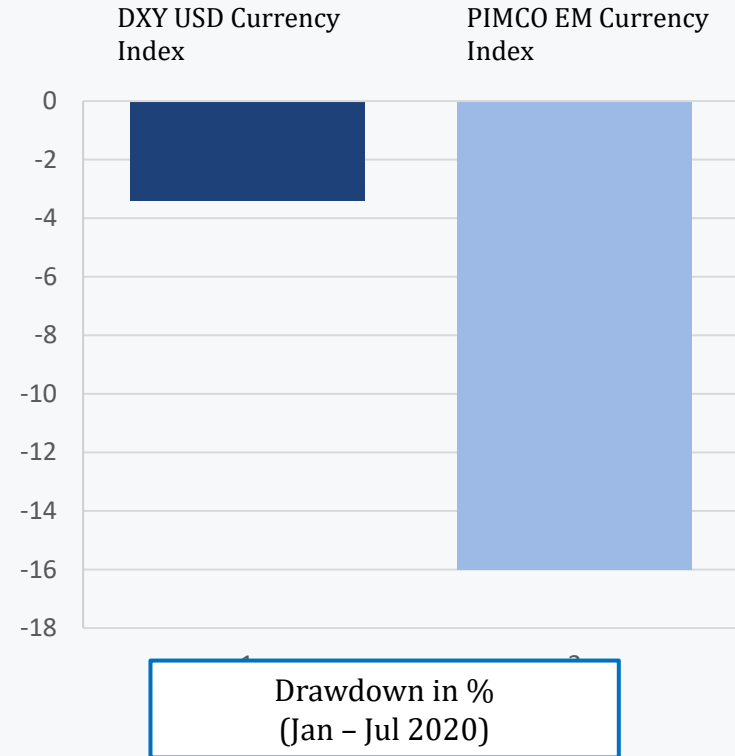
➡ Flight to Quality

Currencies depreciated strongly

## Ramifications can be severe

Increasing liabilities

Higher import & lending costs



# Behavioral Equilibrium Exchange Rates and Covid-19

**Which factors, especially directly Covid-related, constitute the driving forces in moving real exchange rates in Emerging Market economies in amid the first wave of the Covid-19 pandemic**

# Modelling Approach

## Traditional BEER Model (Clark & MacDonald, 1999)

BEER Estimation	Transitory Factors	Error Term
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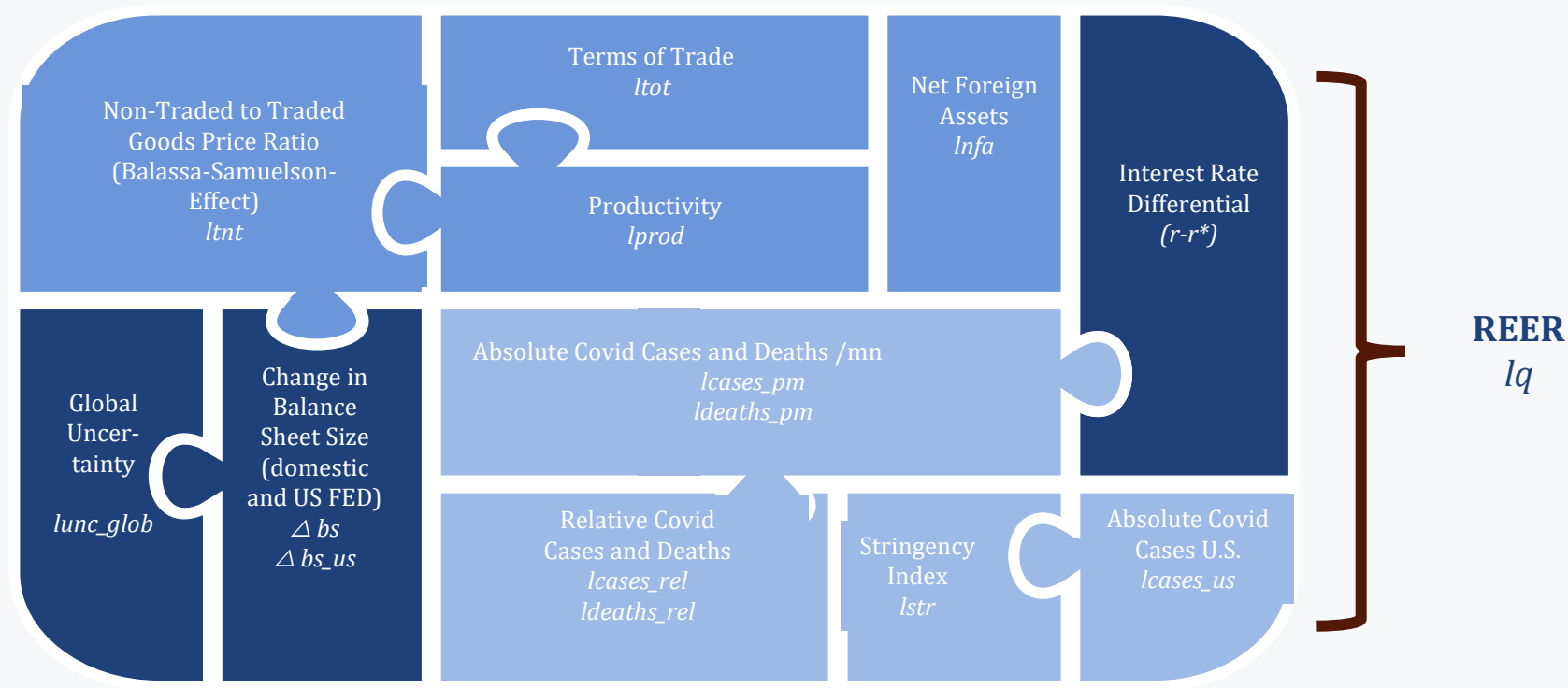
$$q_t = \beta' Z_t + \theta' T_t + \epsilon_t$$

Current Misalignment

## Augmented Corona BEER Model



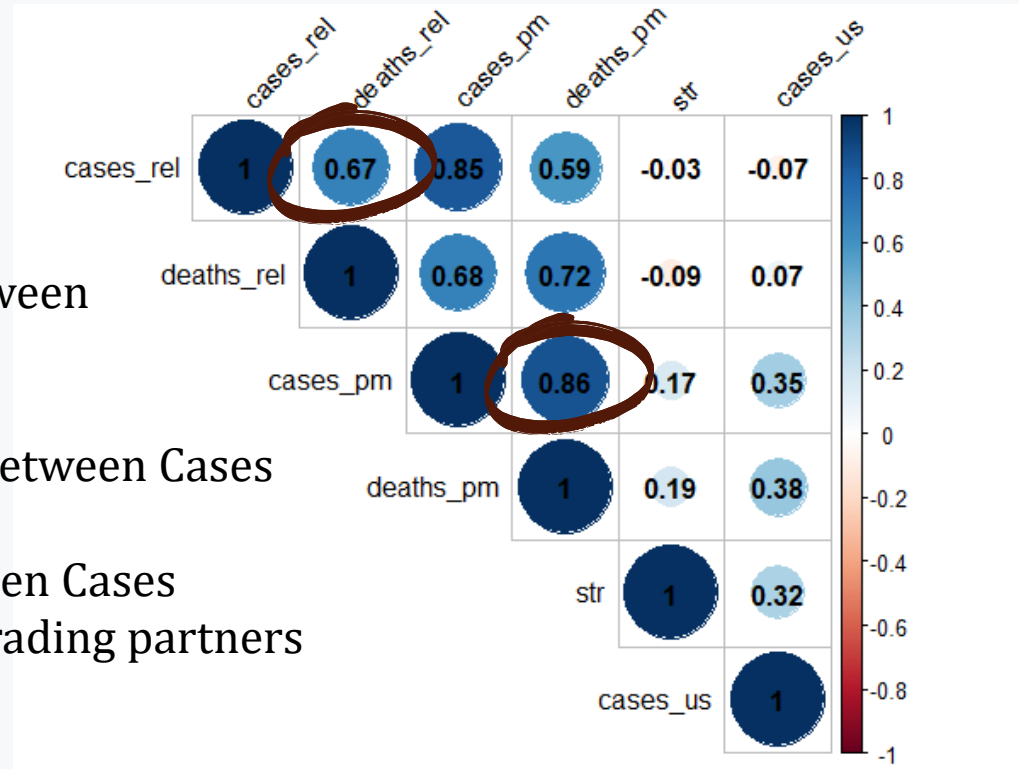
# Variables



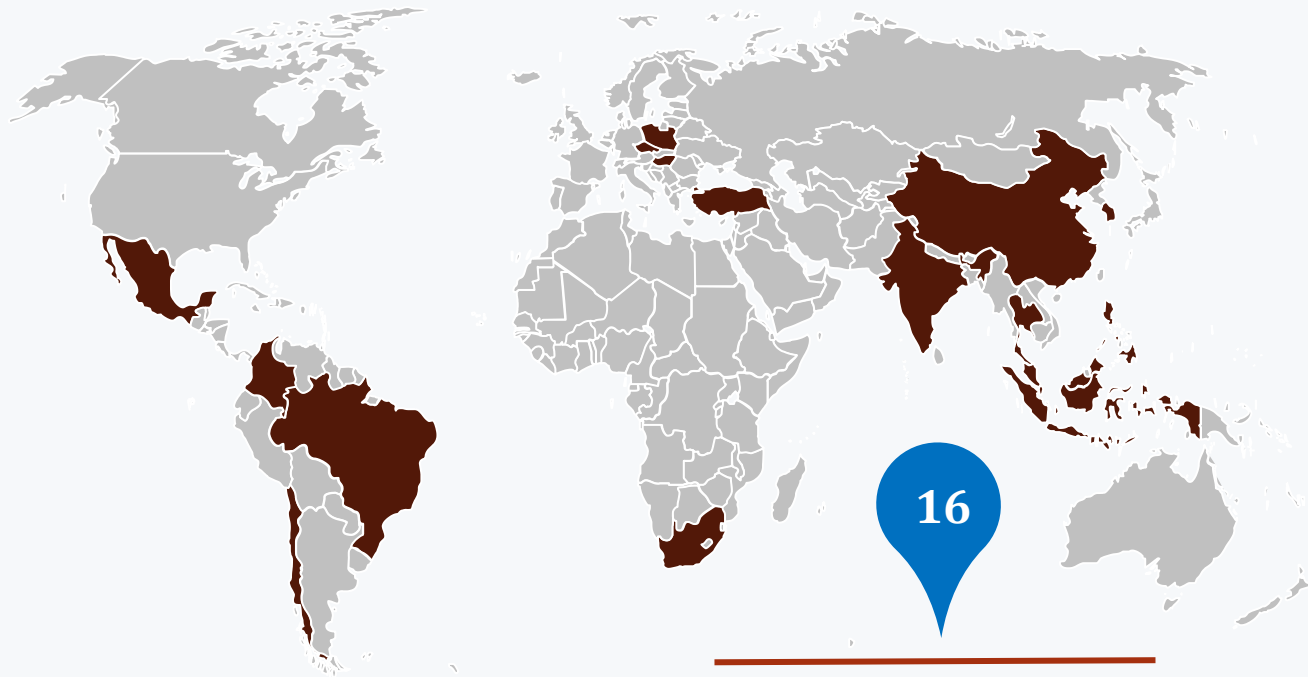


# Correlations

- ➔ Low (negative) correlation between Stringency and Case as well as Death figures
- ➔ Very high positive correlation between Cases and Death figures
- ➔ High positive correlation between Cases and Deaths figures relative to trading partners



# Data



**EM Countries**

# Time Period

91

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**Observations each**

**spanning over more than**

7

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**Years (01/13 - 07/20)**



# Results for the Core BEER Model

	(1)	(2)	(3)	(4)
<i>ltnt</i>	0.061	0.100***	0.106***	0.169***
<i>ltot</i>		0.419***	0.417***	0.366***
<i>lprod</i>		0.050	0.059	0.070**
<i>lnfa</i>		-0.976**	-0.967**	-0.825**
$r - r^*$		-0.002	-0.002	0.0004
$\Delta bs$			0.001**	0.002***
$\Delta bs_{us}$			0.001	0.002*
<i>lunc_glob</i>				-0.049***
Obs.	1,456	1,456	1,456	1,456
Adj. R <sup>2</sup>	-0.010	0.355	0.357	0.397
<i>Note:</i>			* p<0.1; ** p<0.05; *** p<0.01	

## Results for the Corona-BEER

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>ltnt</i>	0.153***	0.156***	0.168***	0.160***	0.166***	0.170***	0.161***	0.146***
<i>ltot</i>	0.365***	0.365***	0.366***	0.373***	0.366***	0.360***	0.354***	0.370***
<i>lprod</i>	0.048	0.040	0.070**	0.060*	0.071**	0.069**	0.041	
<i>lnfa</i>	-0.549	-0.590	-0.823**	-0.780**	-0.852**	-0.776**	-0.515	
<i>r - r*</i>	0.0003	0.0001	0.0004	0.0004	0.001	0.0002	0.0005	
$\Delta bs$	0.002***	0.002***	0.002***	0.002***	0.001**	0.002***	0.001**	0.001**
$\Delta bs_{us}$	0.003**	0.002**	0.002*	0.001	0.002*	0.003***	0.005***	0.002**
<i>lunc_glob</i>	-0.042***	-0.043***	-0.049***	-0.050***	-0.048***	-0.043***	-0.039***	-0.042***
<i>lcases_pm</i>	-0.165***						-0.157**	
<i>ldeaths_pm</i>		-3.110***					-3.972***	-3.259***
<i>lcases_rel</i>			-0.004				0.011	
<i>ldeaths_rel</i>				-1.216**			3.328***	
<i>lstr</i>					0.112***		0.173***	
<i>lcases_us</i>						-0.036***	0.061***	
Obs.	1,456	1,456	1,456	1,456	1,456	1,456	1,456	1,456
Adj. R <sup>2</sup>	0.416	0.416	0.397	0.400	0.401	0.400	0.432	0.416

Note:

\* p<0.1; \*\* p<0.05; \*\*\* p<0.01

# Robustness

- 01 Seasonal adjustments of individual time series
- 02 Deployment of F-Tests and Hausman Tests to confirm choice of within-model/ fixed-effects model
- 03 Reporting of results with robust standard errors computed in accordance with White (1980)
- 04 Reporting of results after taking first differences of variables which have shown to be  $I(1)$  after conducting IPS-Tests
- 05 Estimation of models after grouping into income-related as well as regional sub-groups



Regarding Covid-related variables in the full model, the results for **deaths\_pm** (as well as US numbers) are highly robust



## Corona-BEER, First Diff.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$\Delta ltnt$	1.026***	0.952***	1.023***	1.009***	0.963***	0.915***	0.910***
$\Delta ltot$	0.291***	0.322***	0.279***	0.259***	0.240***	0.299***	0.301***
$\Delta lprod$	0.028	0.008	0.038	-0.033	-0.005	-0.037	
$lnfa$	-1.725***	-1.656***	-1.794***	-1.785***	-1.730***	-1.604***	
$\Delta (r - r^*)$	-0.002	-0.002	-0.001	-0.002	-0.002	-0.002	
$\Delta bs$	0.001	0.001	0.001*	0.001*	0.001*	0.001*	0.001
$\Delta bs\_us$	0.007***	0.007***	0.006***	0.007***	0.008***	0.008***	0.007***
$lunc\_glob$	-0.078***	-0.076***	-0.080***	-0.079***	-0.073***	-0.071***	-0.078***
$\Delta lcases\_abs$	-0.001***					-0.0002	
$\Delta ldeaths\_abs$		-0.048***				-0.039**	-0.050***
$\Delta ldeaths\_rel$			-0.007			0.0004	
$\Delta lstr$				-0.082*		-0.029	
$\Delta lcases\_us$					-0.120***	-0.095***	
Obs.	1,456	1,456	1,456	1,456	1,456	1,456	1,456
Adj. R <sup>2</sup>	0.181	0.178	0.164	0.165	0.172	0.182	0.171
Note:	* p<0.1; ** p<0.05; *** p<0.01						

# Results for Regional Subsamples

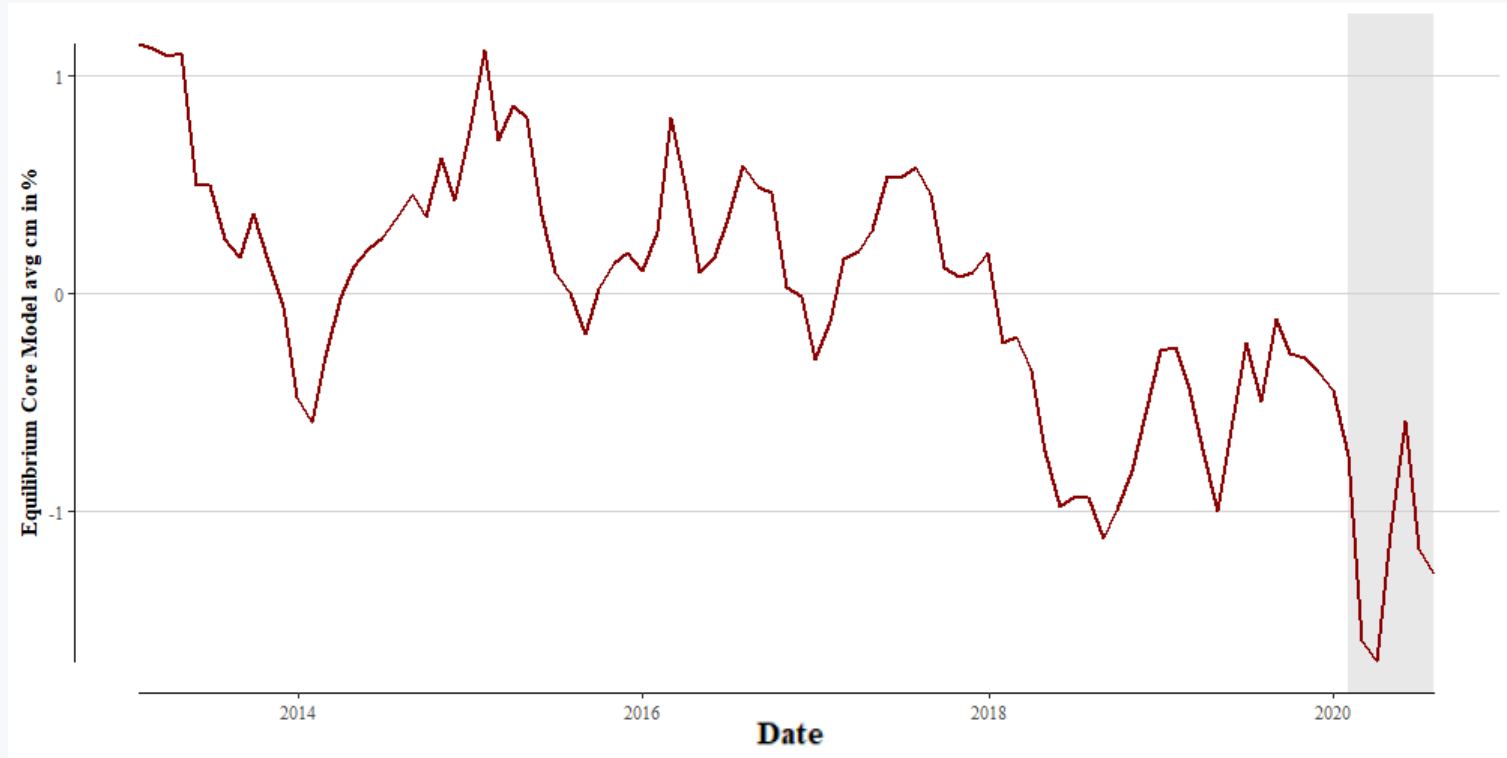
	High	Low	Excluded Country Group			
	Income	Income	Lat. America	East Europe	East Asia	China
	(1)	(2)	(3)	(4)	(5)	(6)
<i>ltnt</i>	0.176***	0.001	0.399***	0.174***	0.285***	0.149***
<i>ltot</i>	0.350***	0.379***	0.205***	0.359***	0.469***	0.371***
$\Delta bs$	0.002**	0.001	0.002**	0.002**	0.002**	0.002***
$\Delta bs_{us}$	0.004**	-0.001	0.004***	0.002	0.003**	0.002*
<i>lunc_glob</i>	-0.055***	-0.012**	-0.036***	-0.053***	-0.071***	-0.042***
<i>ldeaths_pm</i>	-5.044***	-1.286***	-9.895***	-3.154***	-2.524***	-3.264***
Obs.	1,001	455	1,092	1,183	1,001	1,365
Adj. R <sup>2</sup>	0.440	0.365	0.271	0.425	0.518	0.415

Note:

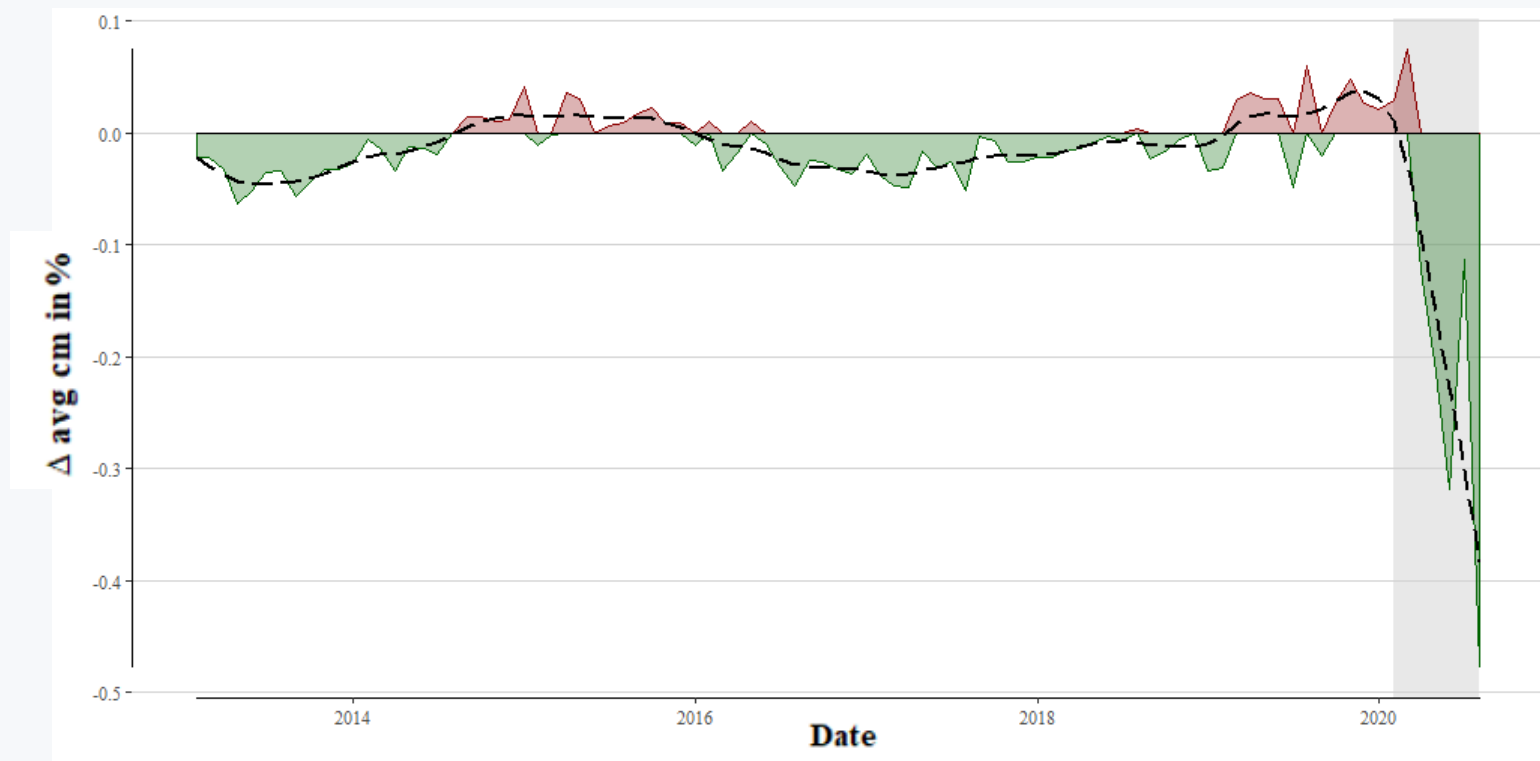
\* p<0.1; \*\* p<0.05; \*\*\* p<0.01



# Current Misalignment - Core Model



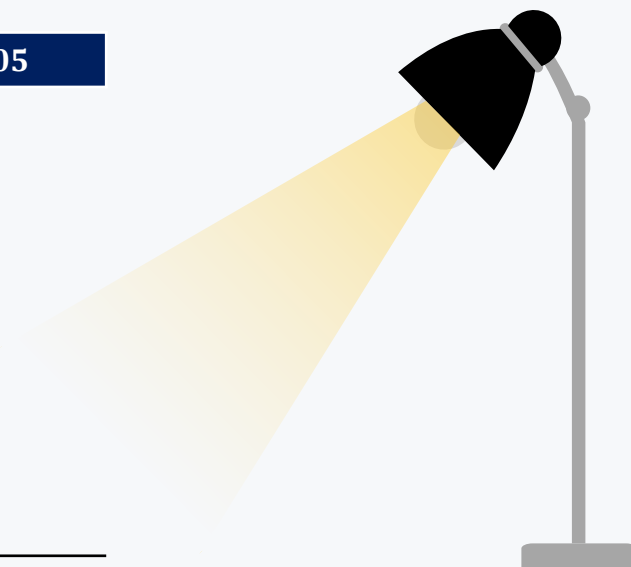
# Current Misalignment - Corona Model



# Results Summary

## Long-run and Control Variates (Core Model)

	Sign	As expected?	p < 0.05
<i>ltnt</i>	+	Yes	Yes
<i>lot</i>	+	Yes	Yes
<i>lprod</i>	+	Yes	No
<i>lnfa</i>	-	No	Yes
<i>(r-r*)</i>	+	Yes	No
<i>lunc_glob</i>	-	Yes	Yes
$\Delta bs$	+	Yes	Yes
$\Delta bs_{us}$	+	Yes	Yes



# Results Summary

## Covid Related Variables (Augmented Model)

	Amended individually			Full model		
	Sign	As expected?	p < 0.05	Sign	As expected?	p < 0.05
<i>lcases_pm</i>	-	Yes	Yes	-	Yes	No
<i>ldeaths_pm</i>	-	Yes	Yes	-	Yes	Yes
<i>lcases_rel</i>	-	Yes	No	+	No	No
<i>ldeaths_rel</i>	-	Yes	Yes	+	No	Yes
<i>lstr</i>	+	Yes/No	Yes	+	Yes/No	Yes
<i>lcases_us</i>	-	Yes	Yes	+	No	Yes

# Results – Sub - Samples

## Covid Related Variables (Augmented Model)

	Income related	Geographical
	Key Findings	Key Findings
<i>lcases_pm</i>		
<i>ldeaths_pm</i>	More pronounced for MI REERs	More important for LA, less pronounced for EE
<i>lcases_rel</i>		
<i>ldeaths_rel</i>	More pronounced for MI REERs	More pronounced for EA, less pronounced for LA and EE
<i>lstr</i>	Constant across income groups	Constant across regions
<i>lcases_us</i>	More important for HI REERs	

MI = Middle Income; HI = High Income; LA = Latin American economies; EA = East Asian economies; EE = Eastern European economies

# Outlook



01

Effect of Relative Covid Deaths on EM Exchange Rates must be examined further

02

Effects on EM Exchange Rates and misalignments must be examined as Covid Pandemic continues

03

Different contributions of effects of Relative and Absolute Covid deaths for different countries must be examined

04

Policy implications can be derived

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Thank You!

Ačiū!

Děkuji!

Danke!

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