

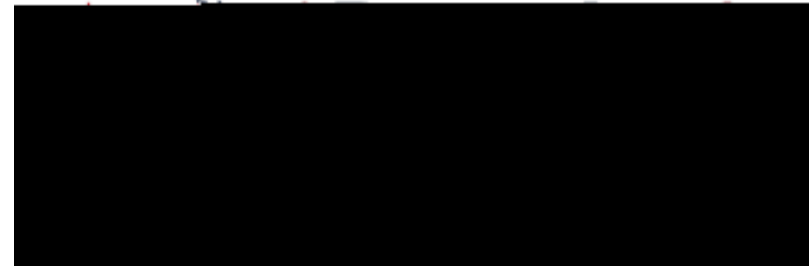
# Climate risk, responsible banking and securitization

Alper Kara<sup>1</sup>, Aziidah Nanteza<sup>2</sup> and Yilmaz Yildiz<sup>3</sup>

<sup>1</sup>Department of Economics and Finance, Brunel University London

<sup>2</sup>School of Business, Education and Law, University of Huddersfield

<sup>3</sup>Kent Business School, University of Kent



# Introduction

Climate change is the most pressing challenge for the sustainable economic development (WHO, 2014).

Banks are expected to play a significant role in tackling climate change.

Because banks allocate financial resources economy-wide (Brunnermeier and Landau, 2021; Aracil et al., 2021).

# Introduction

Investors' pay much more attention to climate risk mitigation strategies.

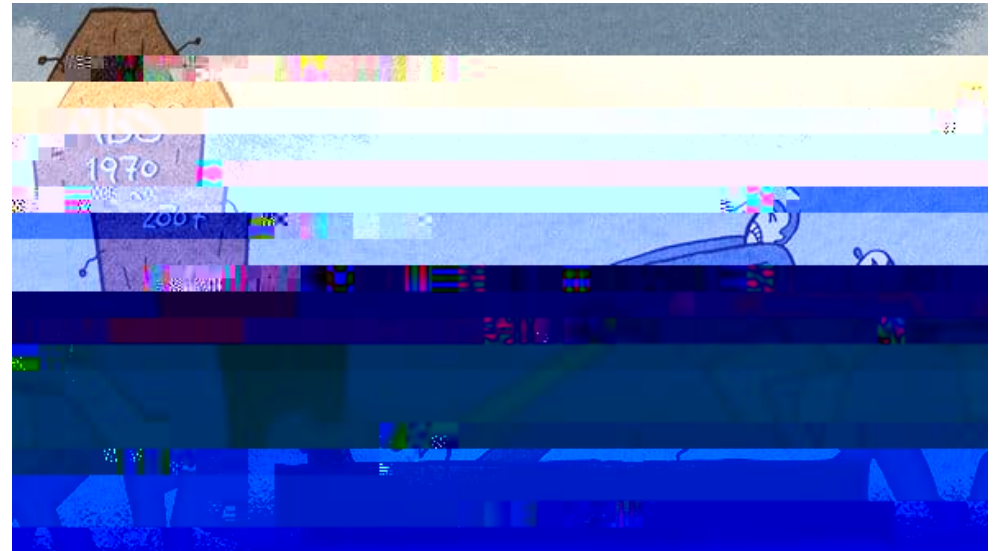
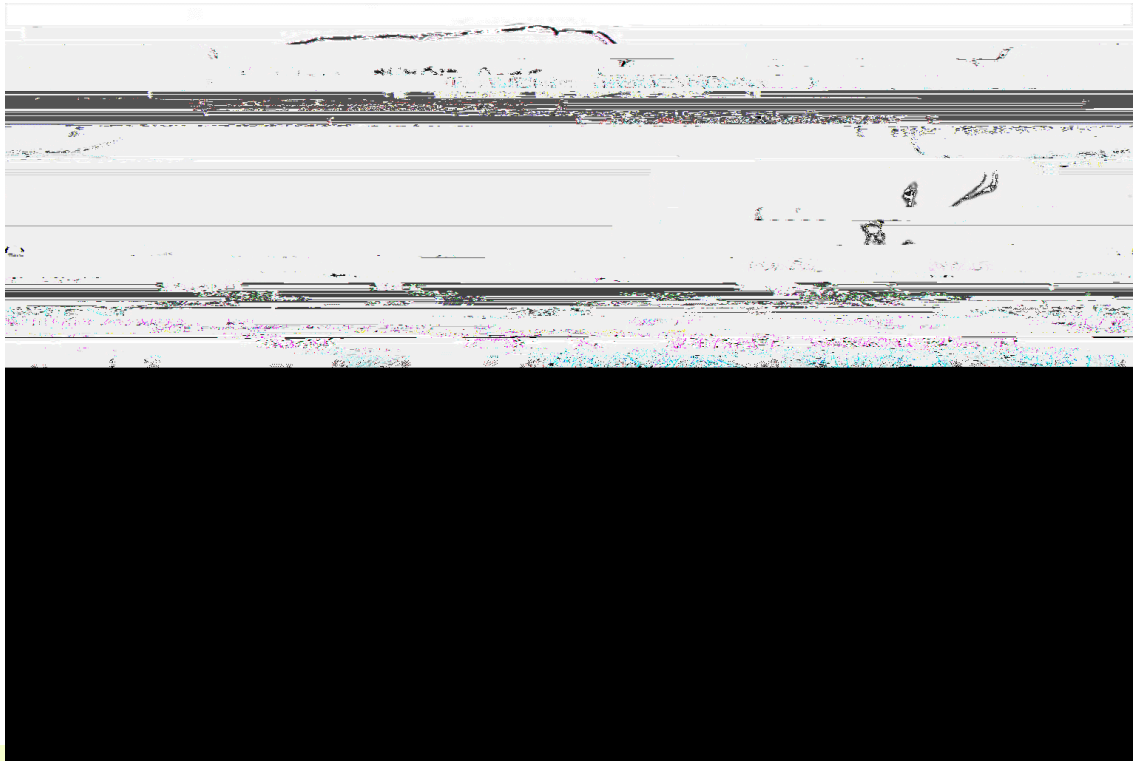
Investors consider climate risks when pricing assets (Huynh and Xia, 2021; Huynh et al., 2020; Baldauf et al., 2020).

Especially for securities with longer term horizons (Painter, 2020).

# Motivation 1

Are banks exposed to climate risk when issuing long-term and complex to evaluate financial instruments?

Focus: Mortgage-backed securities (MBS)



# Securitization process



# Climate risk and MBS

MBS are **long-term instruments** supported by pools of **mortgages that have very long maturities**.

Average **maturity** for MBS is over **30** years.

Adverse effects of climate change are **more likely to materialize in the long-term** (Javadi and Masum, 2021).

MBS are exposed to

to exposed

# Climate risk and MBS

Both **physical** and **transition risks** are relevant in the context of real-estate collateral.

## Physical risk:

**Sea level rise** (SLR) as a result of climate change.

SLR leads to **price discounts** due to concerns about climate change (Baldauf et al., 2020; Keys and Mulder, 2021).

Banks **charge higher interest rates for mortgages on properties exposed** to greater SLR risk (Nguyen et al., 2022).

# Climate risk and MBS

## Transitional risk:

Real-estate may be also be impacted as a result of **rising costs** due to:

Changing **stringent building codes** and **stringent regulation**





# Hypotheses

$H_1$ : MBS which are more exposed to climate risk have higher spreads at issuance

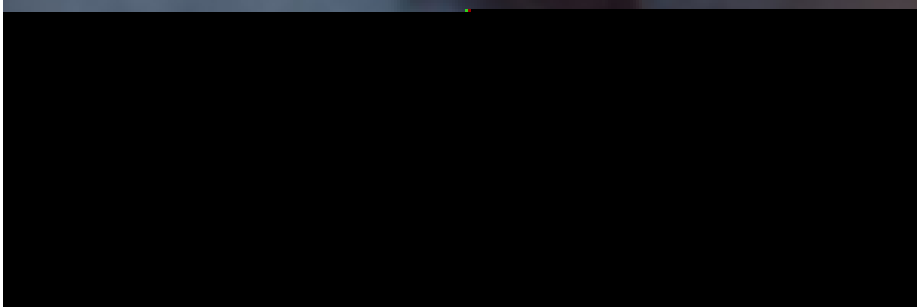
$H_2$ : Being a signatory bank of responsibility charters mitigates the negative impact of climate change on MBS spreads at issuance

# Contribution

Provide evidence on the link between climate risk and securitization as well as MBS valuation.

The integration of climate risk into





# Methodology

$$\text{Spread} = \alpha_0 + \alpha_1 \text{Climate risk} + \alpha' X + \epsilon$$

*Spread*: Initial yield spread of MBS at issuance set in basis points over the relevant benchmark interest rate.

*Climate risk*: ND-GAIN vulnerability index – *GDP adjusted*

*X*: Tranche-specific and macro characteristics

Control for *country fixed effects* in all estimations



T11.9.D. [redacted]

[redacted]









	Yes	Yes	Yes	Yes	Rating	Yes	Yes
	Yes	Yes	Yes	Yes	Year	Yes	Yes
	Yes	Yes	Yes	Yes	Country fixed	Yes	Yes
	Yes	Yes	Yes	Yes		Yes	Yes
41.889**	Constant						
38.116***							
82.014***							
4.259***							
4.248***							
39.807**							
13045	13045	6522	6522	6523	6523	N	
0.666	0.667	0.485	0.485	0.764	0.765	R squared	



Table 8. Regressions after entropy balancing

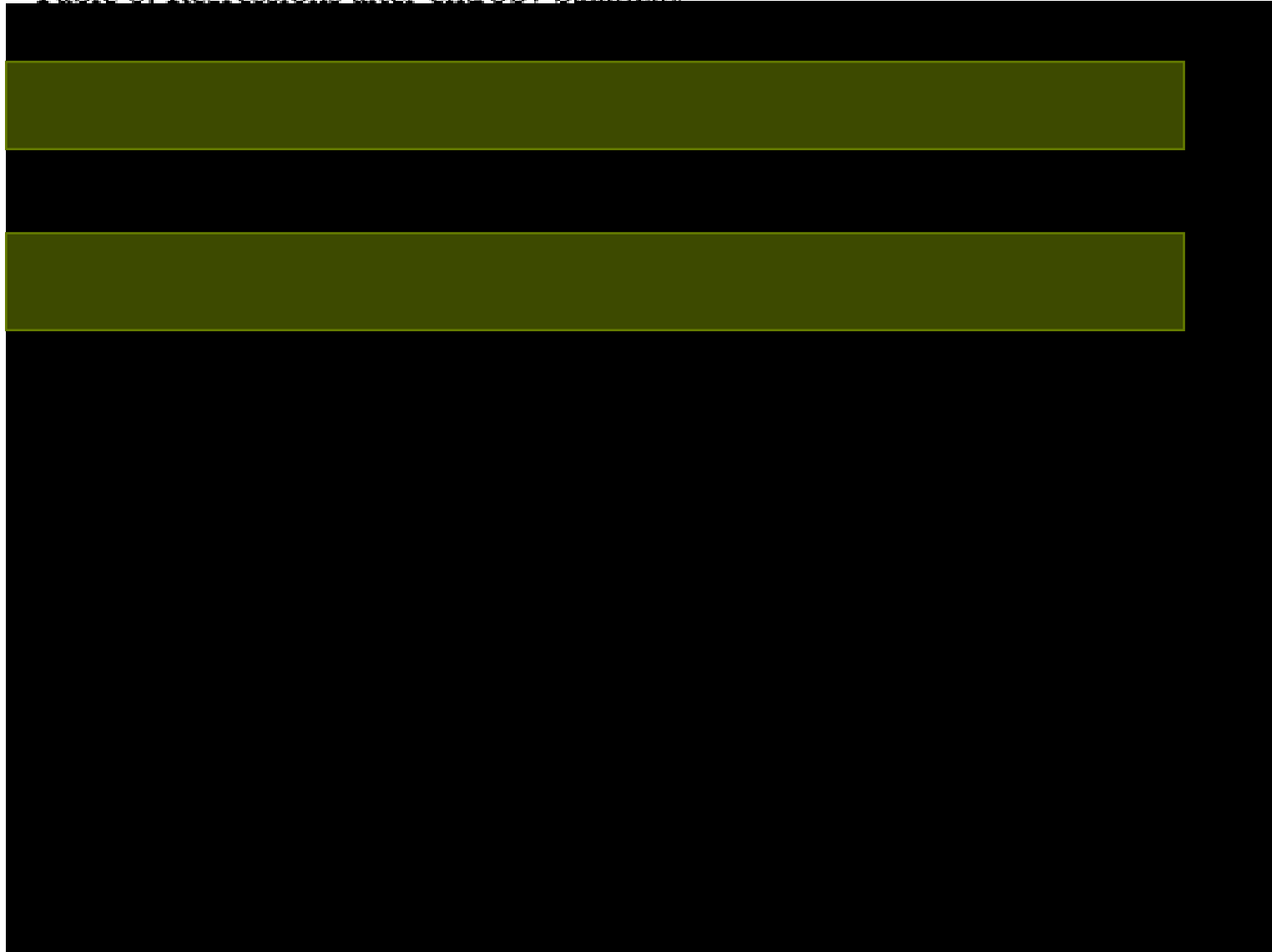




Table 10. The role of maturity

	(1)	(2)
Climate risk	11.575***	10.617***
	(3.808)	(3.452)
Constant	0.001	0.001
Controls	Yes	Yes
Rating	Yes	Yes
Year fixed	Yes	Yes
Country fixed	Yes	Yes
Observations	13045	13045
R squared	0.665	0.666

of maturity of the security (Maturity) on the risk and MBS Spread. Dependent variable in

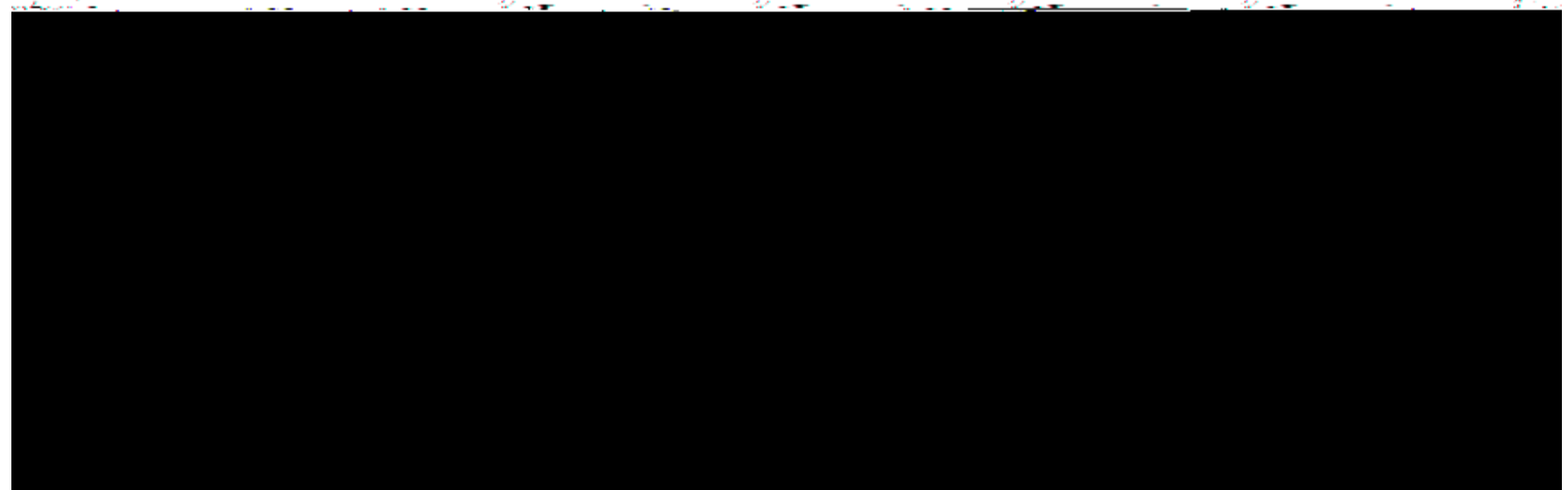
This table presents the role relationship between Climate

of maturity of the security (Maturity) on the risk and MBS Spread. Dependent variable in  
 this case is the MBS Spread. The independent variable is Climate risk. The control variables are Rating, Year fixed, and Country fixed. The observations are 13045. The R squared is 0.665 for model (1) and 0.666 for model (2).  
 \*\*\* p < 0.001, \*\* p < 0.01, \* p < 0.05.

Table 10: Climate risk and UNPI. The dependent variable is the natural log of the number of UNPI. The independent variables are climate risk and UNPI. The control variables are the same as in Table 9. The sample is split into two groups: the first group is the period from 2000 to 2009, and the second group is the period from 2010 to 2019. The results are reported in the following table.

	(1)	(2)	(3)		(4)
	18.684***	6.151***	6.458***	Climate risk	19.684***
	(3.124)	(0.816)	(0.985)		(3.697)
	(0.029)	(0.022)	(0.021)		(0.026)
UNPI		-1.589***		Climate risk x UNPI	
		(0.244)			(0.762)

Constant Yes Yes Yes Yes







# Main Conclusions

Investors demand higher returns for MBS from countries with greater exposure to climate risk.

Negative impact of climate risk on MBS returns is lower for responsible banks.

Commitment to

# Climate risk, responsible banking and securitization

Alper Kara<sup>1</sup>, Aziidah Nanteza<sup>2</sup> and Yilmaz Yildiz<sup>3</sup>

<sup>1</sup>Department of Economics and Finance, Brunel University London

<sup>2</sup>School of Business, Education and Law, University of Huddersfield

<sup>3</sup>Kent Business School, University of Kent

