

Coastal flood risk and the Danish economy

The Danish Environmental Economic Conference, August 2023
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Since 2019, Danmarks Nationalbank investigates coastal flood risk in the context of its **financial stability mandate** .

At the outset, we identified **three big, open questions:**

1. **Significance:** How important is flood risk for the Danish economy?
2. **Market functioning:** Are households/firms/banks aware of flood risk?
3. **Policy interventions:** What policy interventions, if any, are justified?

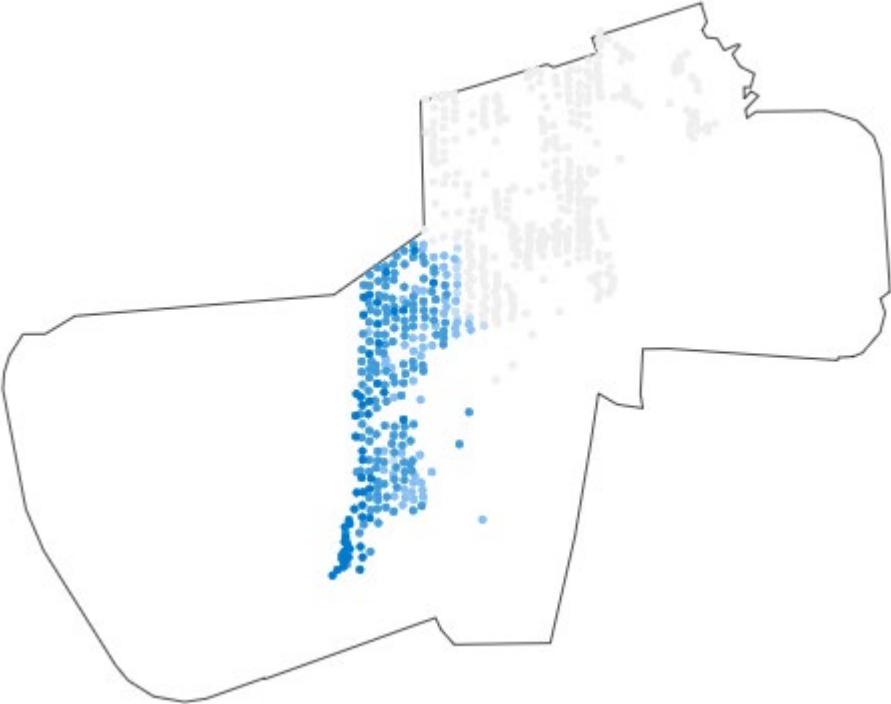
Significance : Coastal flood risk has a limited macroeconomic and financial stability impact

time	20-year horizon (flood risk > 5% per year)	100-year horizon (flood risk > 1% per year)
2021	0.93	1.26
2071-2100 optimistic scenario (RCP 4.5, mean)	1.72	2.21
2071-2100 pessimistic scenario (RCP 8.5, mean)	2.39	2.95

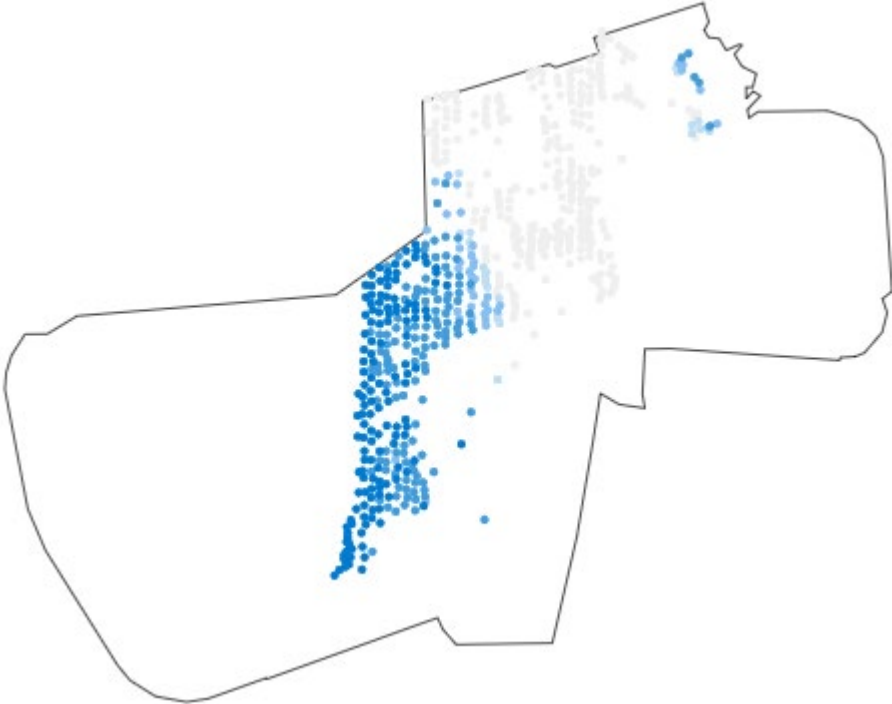
Source: Poeschl, J. & Mirone, G. (2021). Flood risk discounts in the Danish housing market. Danmarks Nationalbank Economic Memo 7(2021).

- Jygert & Mirone (2021) report that 7% of the Danish banks’ loan portfolio will be exposed in a worst -case scenario (RCP 8.5, 90th pctile)

Illustration: Non-random location of flood risk exposure is a challenge to analyzing its effects



2021



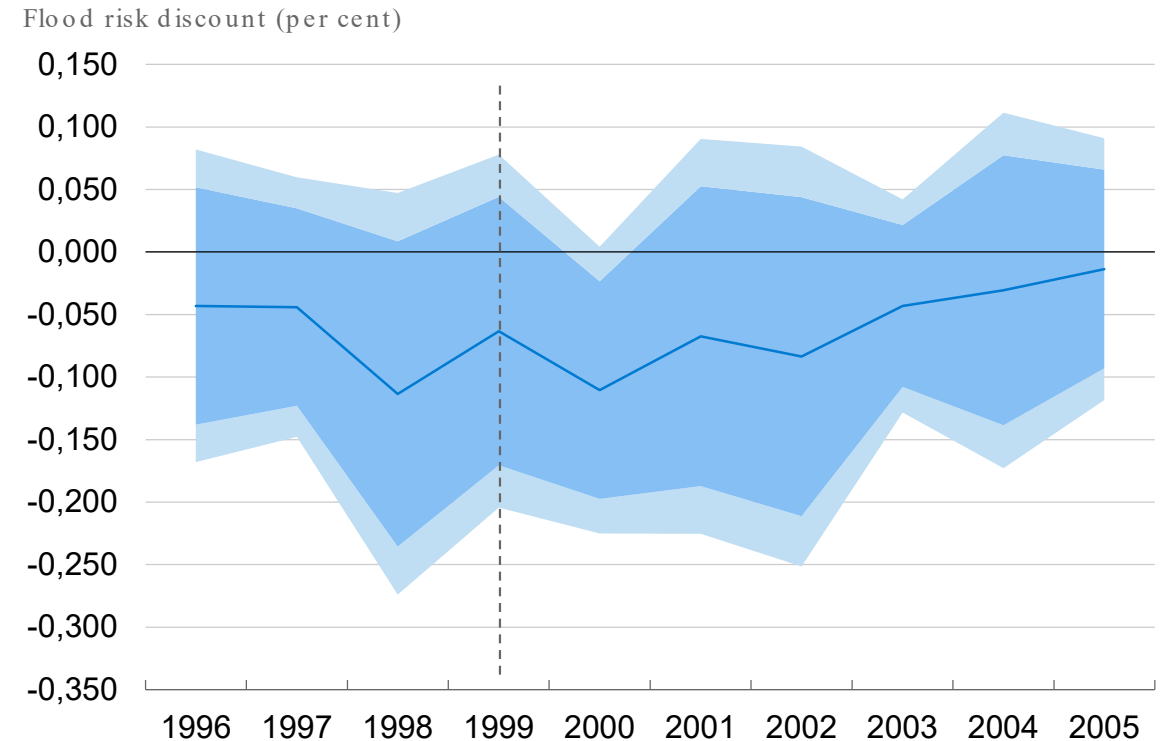
2071 – baseline scenario

Source: Poeschl, J. & Mirone, G. (2021). Flood risk discounts in the Danish housing market.

Danmarks Nationalbank Economic Memo 7(2021).

Market functioning: While households (sometimes) price coastal flood risk, banks do not

- Poeschl & Mirone (2021): Exposure to
 - current flood risk reduces house prices by ~6 percent
 - future flood risk reduces house prices by ~3 percent
- The salience of flood risk varies over time
- Lautrup , Matthiesen , Jacobsen & Panduro (2023) find similar results
- Poeschl (2022): banks do not incorporate flood risk into lending decisions



Source: Poeschl, J. & Mirone, G. (2021). Flood risk discounts in the Danish housing market. Danmarks Nationalbank Economic Memo 7(2021).

Policy interventions: costs, benefits, and side effects of possible policies are not well understood

Two approaches to policy:

- Flood risk mitigation (the **engineers' approach**):
 - Coastal protection measures
 - Requires extensive cost -benefit analysis
- Flood risk insurance (the **economists' approach**):
 - Diversify flood risk as much as possible and allocate the rest to those best able to bear it
 - Requires functioning markets, creates moral hazard issues

But: flood risk exposure is a choice (subject to constraints)

- We need to understand better :
 - Which households / firms/banks are exposed to flood risk?
 - Why are these households / firms/banks exposed to flood risk?