

# DANMARKS NATIONALBANK

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## A REGIONAL MODEL OF THE DANISH HOUSING MARKET

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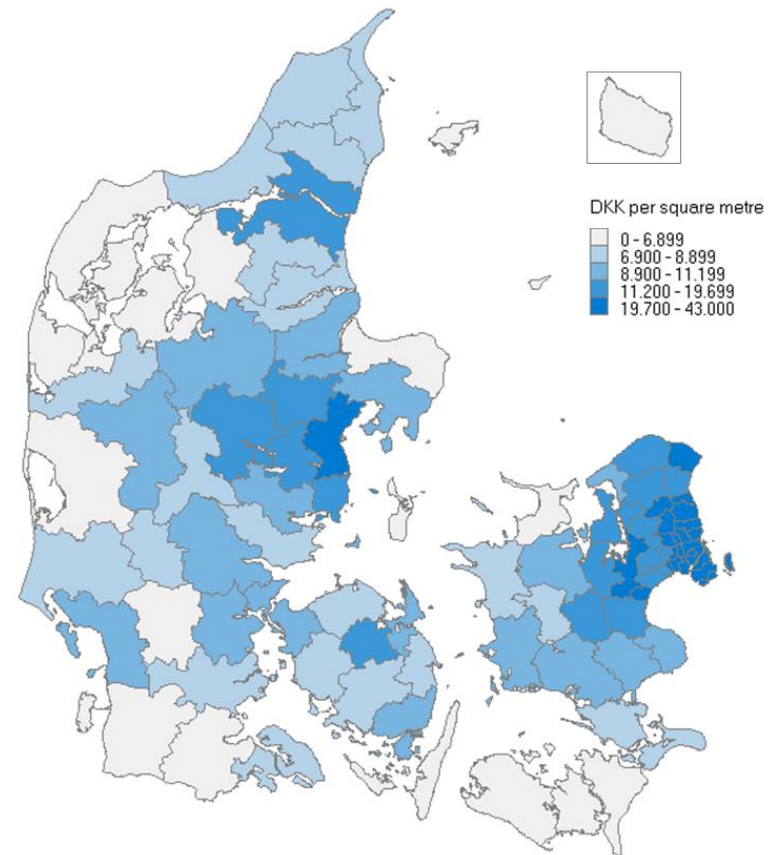
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# Differences in regional housing markets

- Large geographical differences across the Danish housing market.
- In particular, house prices in Copenhagen have risen above the country average.
- Need to understand demand and supply dynamics across geography, and the interconnectedness.



House prices in the 4th quarter of 2016  
Source: boligmarkedsstatistikken

# A new regional model of single-family houses

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- A new tool for surveillance of developments in the housing market.
  - Submarkets of single-family houses are interconnected through the ripple-effect.
  - Supply constraints and demographics impact regional price formation.
  - Adjustments to equilibrium takes long time.

# The econometric approach

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- Global error correction model that allows for spillovers, i.e. the ripple effect
- Components of the model:
  - 1) Long-run equilibrium
  - 2) Short-run dynamics within region (persistence/adaptive expectations)
  - 3) Short-run dynamics across regions (geographical shift in demand)
  - 4) Short-run exogenous variation (change in fundamental variables)
- Allow for regional heterogeneity

# Data

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Sample: 1987Q1 to 2016Q4

Province-level data

Data as in Monetary Review Q4 with exceptions:

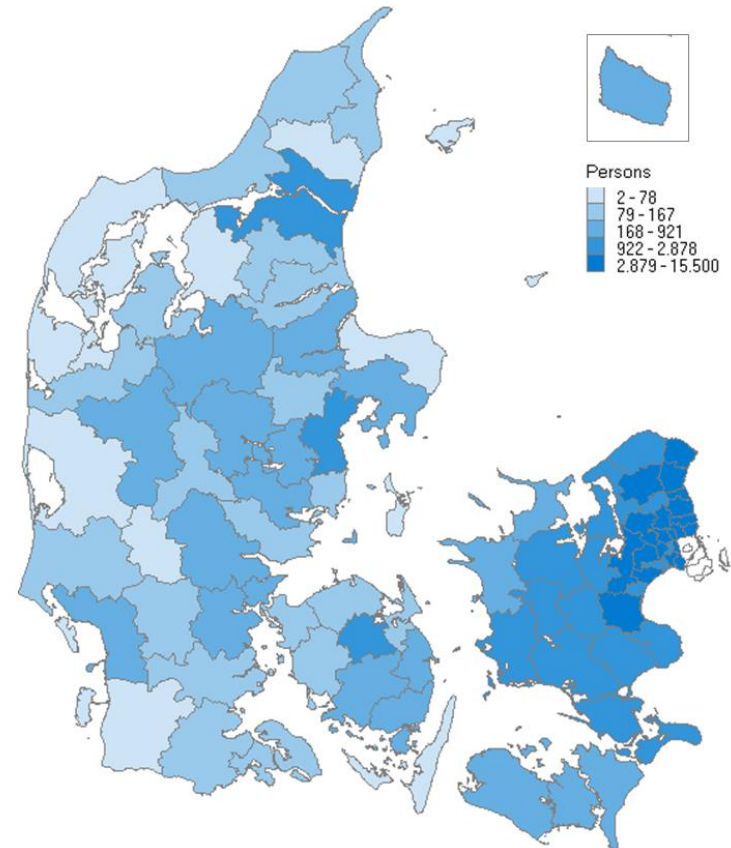
- House price index weighted by square metre prices from boligmarkedsstatikken
- Disposable income from Statistics Denmark's Income Statistics
- Ripple effect variable
- Utilize demography and geography variables.



# The ripple effect

## Commuting :

- When prices in one region rise, some households will substitute to other regions.
- If households prefer to live close to work, the amount of commutes captures the substitution between regional housing markets.
- The ripple effect allows price spikes in one region to transmit across regions, and thus stabilizes house prices in expensive areas.
- We can exploit these patterns to construct a measure of the strength of the ripple effect across regions.



Commutes into the city of Copenhagen in 2015  
Source: Danmarks Statistik

# Transmission across regions

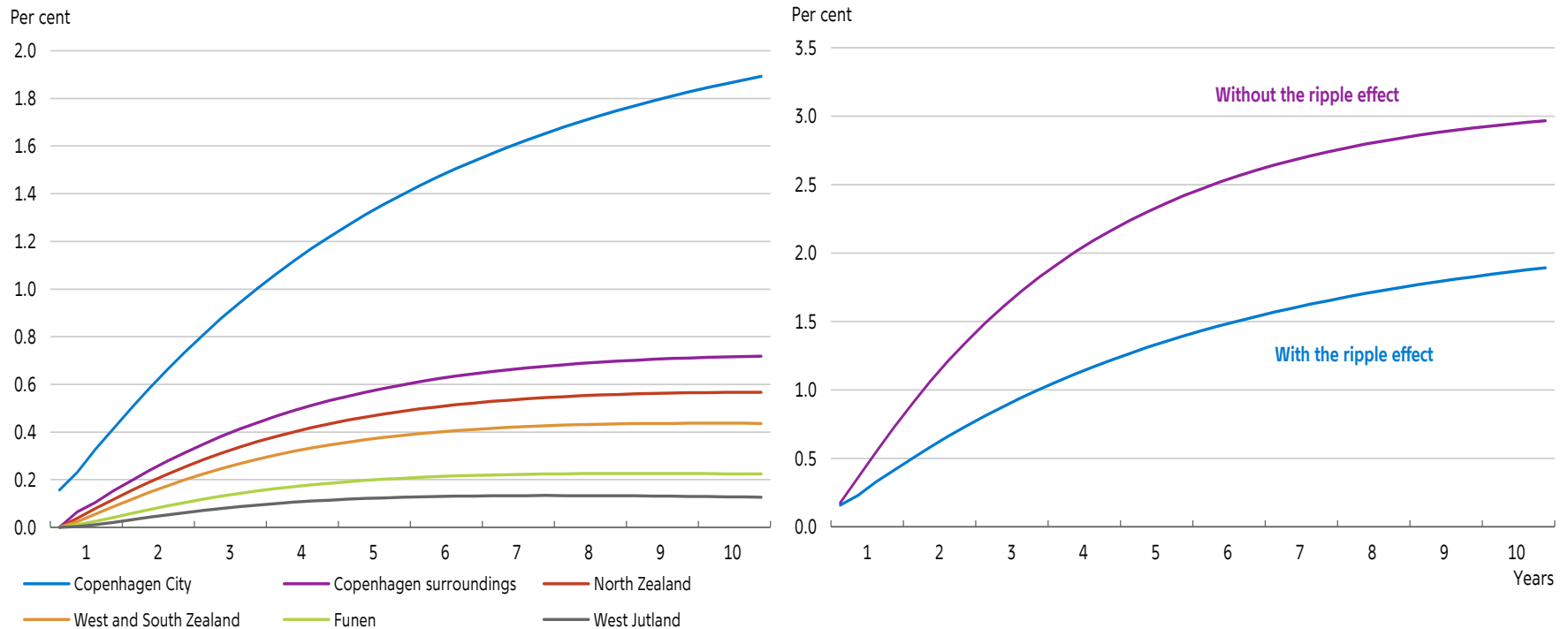
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Prices in other regions are weighted by relative fraction of communités

	KBH	KBO	NSJ	QSJ	VSJ	FYN	SJY	QJY	VJY	NJY
KBH		67	16	7	5	1	1	2	0	1
KBO	71		16	8	3	0	1	1	0	0
NSJ	42	49		4	2	0	1	1	0	0
QSJ	35	45	8		10	1	1	1	0	0
VSJ	25	32	6	30		2	2	2	1	1
FYN	12	9	2	2	8		50	11	3	2
SJY	7	8	2	1	2	21		35	21	4
QJY	9	6	2	1	1	4	31		34	13
VJY	4	4	1	1	1	2	22	45		20
NJY	9	9	3	1	2	2	9	36	29	

# Local housing market shocks affect the entire country

The effect of a shock to income in Copenhagen City of 1 percentage point on house prices

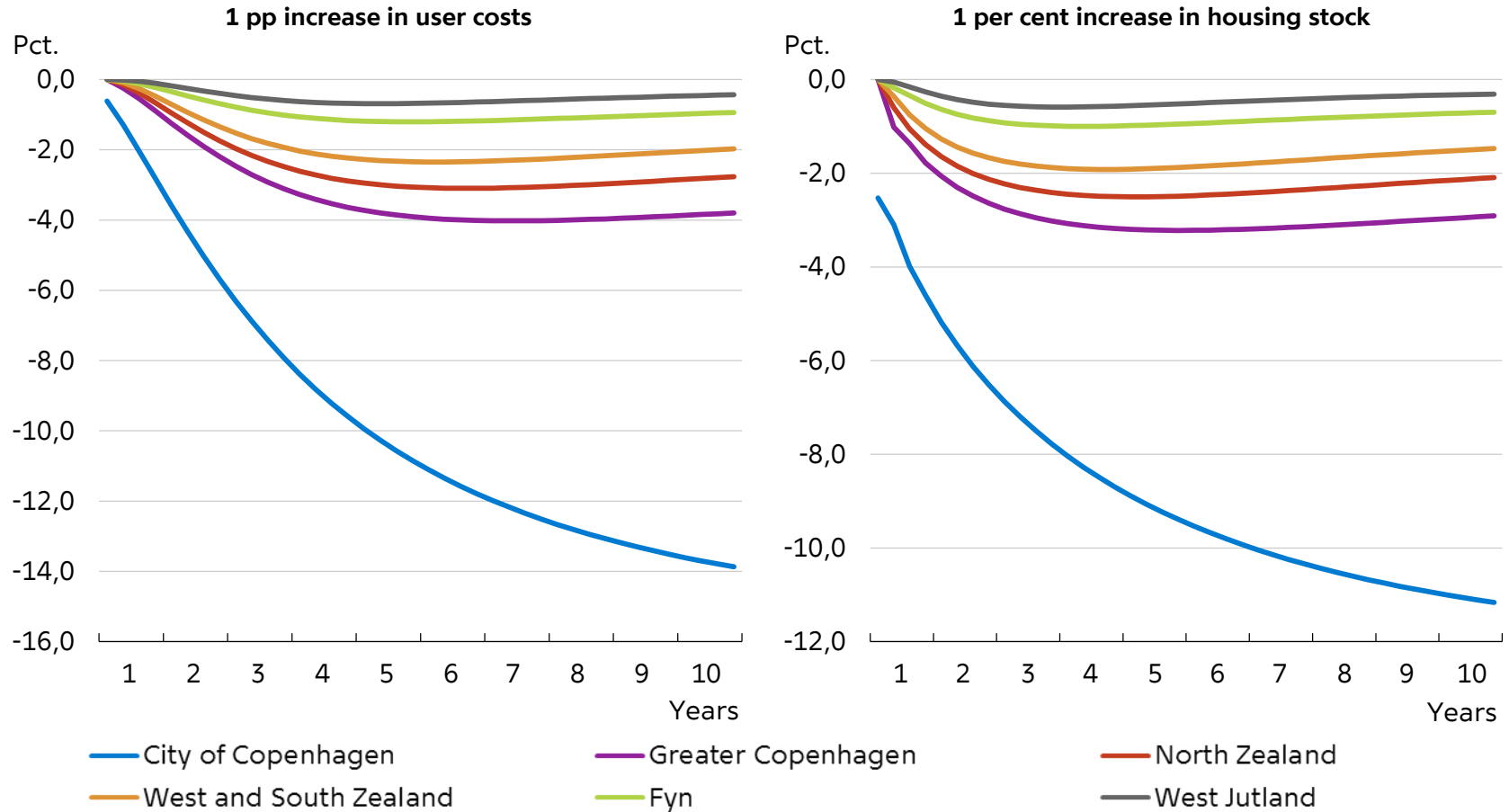


Note: Model based calculations  
Source: Danmarks Nationalbank.



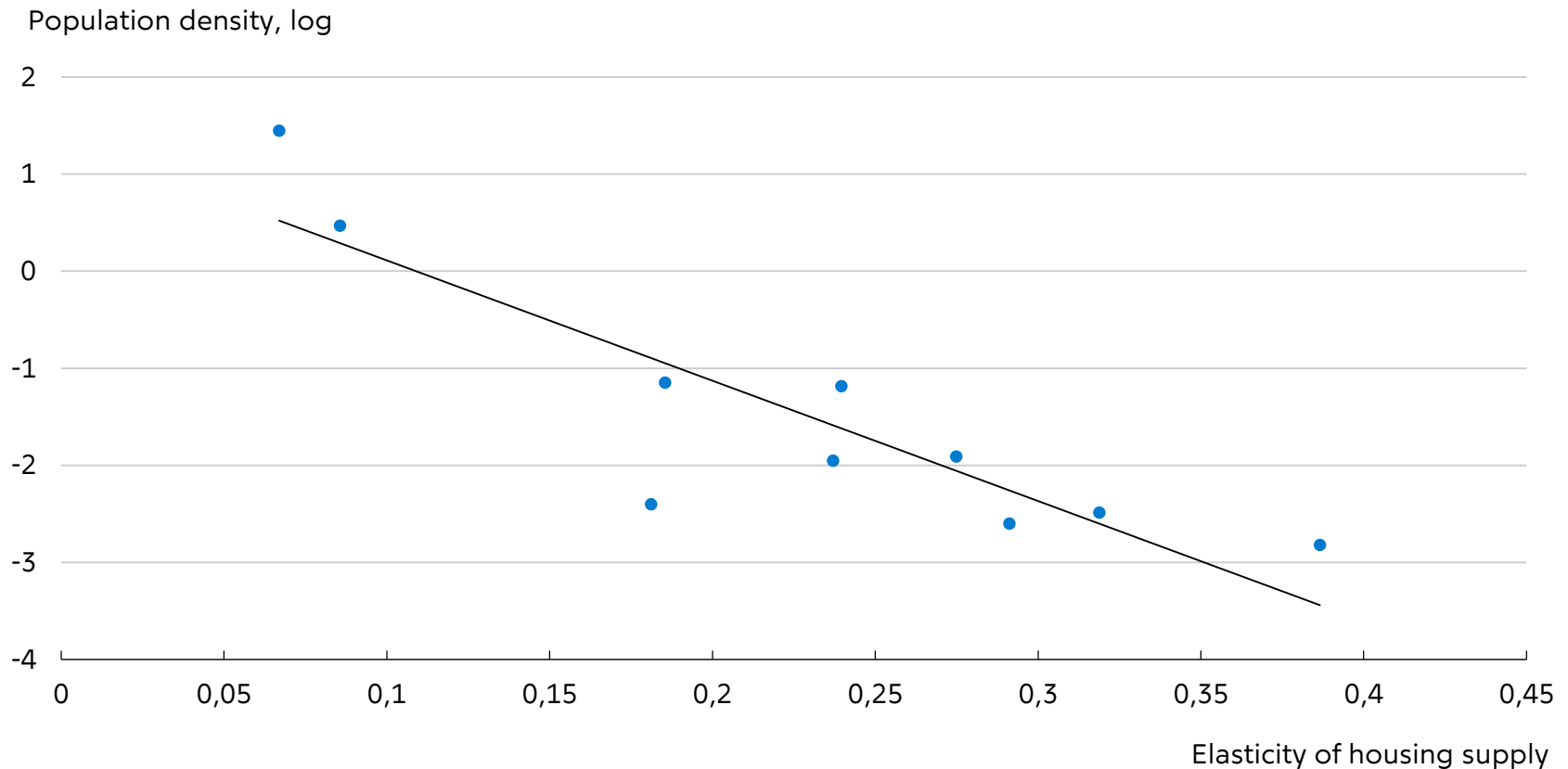
# Local shocks affect house prices across the country

## Impulse responses of house prices of shocks in City of Copenhagen



Source: Model simulations

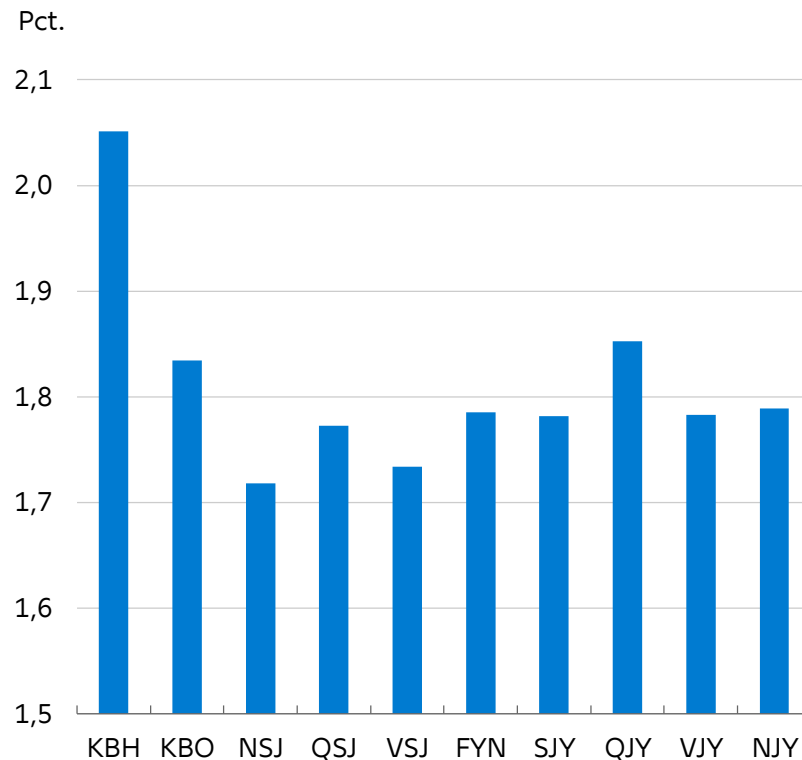
# Supply of houses reacts less in highly populated areas



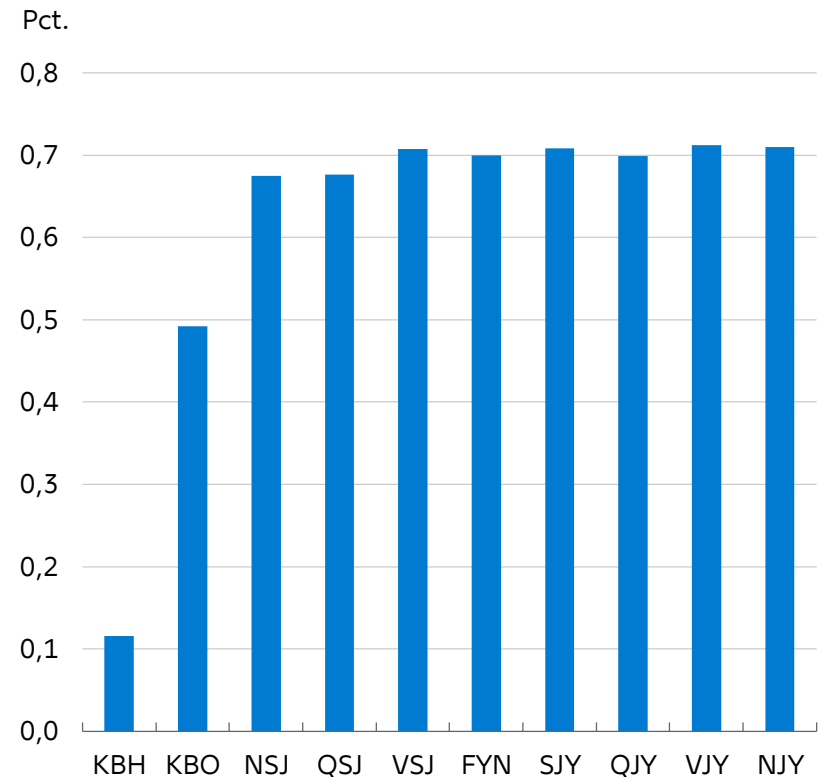
# Regional supply constraints matter for price formation

## Effect on long-run prices

Income elasticity



Prices in other regions



# Boligskatteaftalen dæmper de regionale forskelle i boligpriserne

## Forudsatte effektive ejendomsværdiskattesatser, pct.

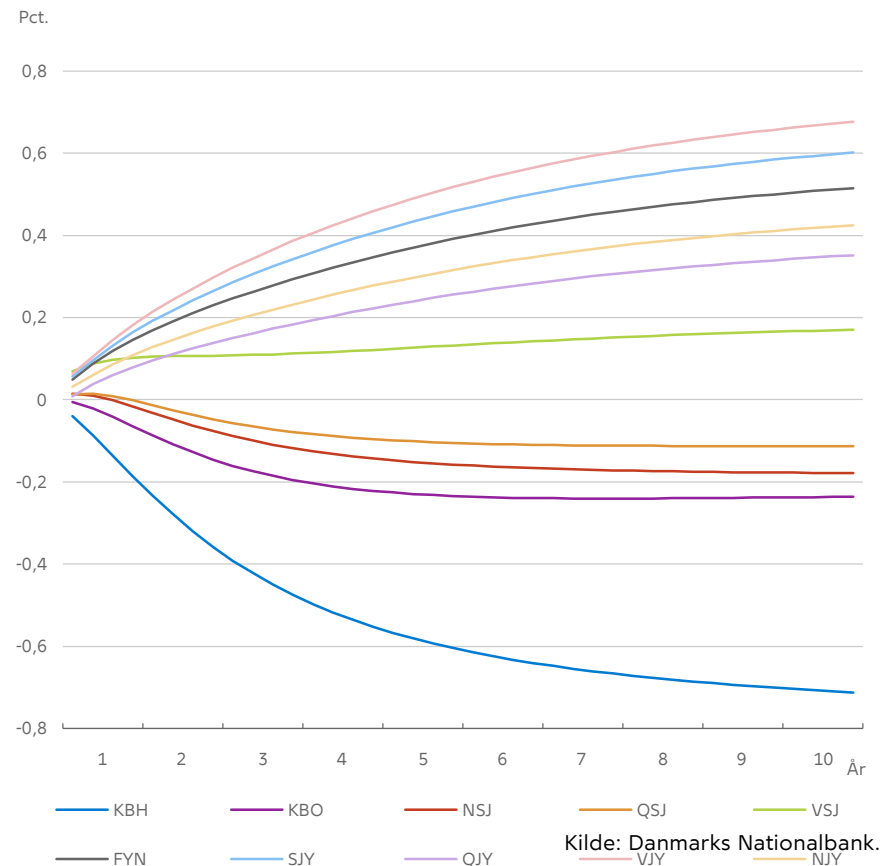
Tabel 1

	2016	2020
København by, KBH	0,40	0,35
København omegn, KBO	0,49	0,43
Nordsjælland, NSJ	0,55	0,48
Østsjælland, QSJ	0,55	0,47
Vest- og Sydsjælland, VSJ	0,70	0,60
Fyn, FYN	0,64	0,55
Syddjælland, SJY	0,66	0,57
Østjylland, QJY	0,54	0,46
Vestjylland, VJY	0,68	0,59
Nordjylland, NJY	0,60	0,51

Anm.: Den effektive sats for 2020 er baseret på en fremskrivning af boligpriserne med årligt 3 pct. på tværs af landet.

Kilde: Beregninger på mikrodata fra Danmarks Statistik.

## Priseffekterne af boligskatteaftalen



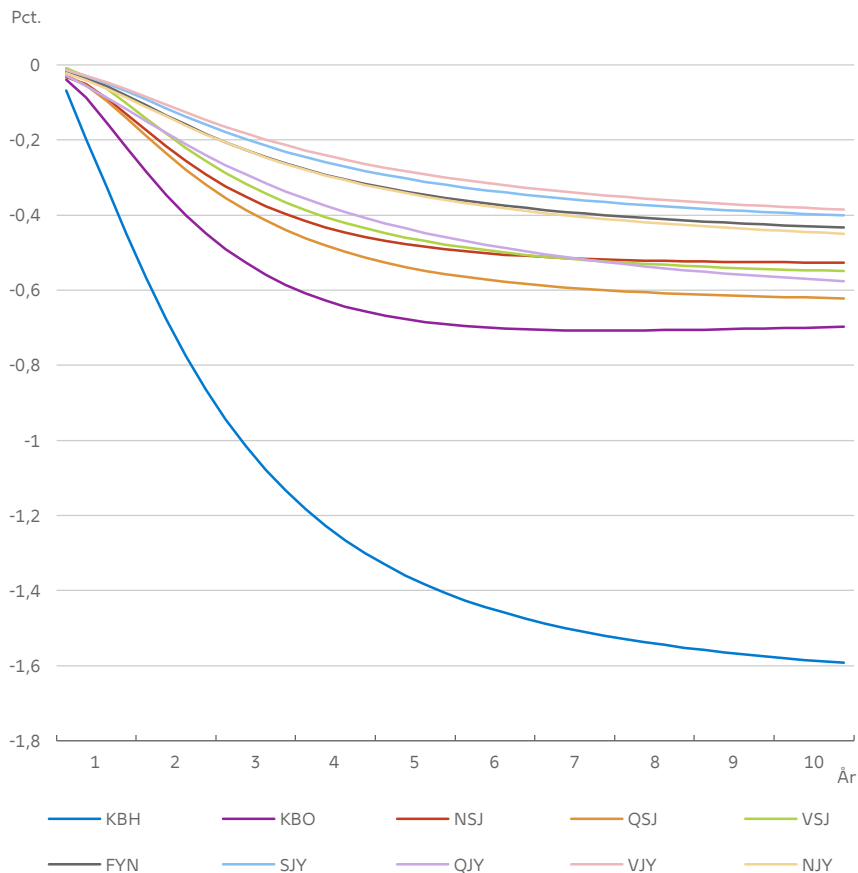
Kilde: Danmarks Nationalbank.



# Bølgeeffekt: Lokale stød påvirker priserne i hele Danmark

## Priseffekt af tillægget til God-skik bekendtgørelsen

Mindste førsteårsydelse: 0,61 -> 2,13



## Berørte boligkøbere, pct.

Tabel 1

	God-skik	DSRR	- 15 pct.
København by	20,3	32,9	17,9
København omegn	11,6	20,7	5,7
Nordsjælland	9,4	17,7	-
Østsjælland	8,1	15,4	-
Vest- og Sydsjælland	2,6	5,3	-
Fyn	5,5	9,4	-
Sydjylland	4,1	7,1	-
Østjylland	8,7	15,1	0,1
Vestjylland	3,8	6,9	-
Nordjylland	6,4	11,3	-

Anm.: Der er betydelig usikkerhed om hvor mange boligkøbere, som ville være blevet påvirket af henstillingen fra Det systemiske Risikoråd, da afvigelsen på 15 pct. ikke kun påvirker boligkøberne, men alle nyudlån. Det er uklart hvordan institutterne ville have allokere de 15 pct.. Desuden stemmer de geografiske afgrænsninger i henstillingen ikke overens med landsdelene.

Kilde: Beregninger på mikrodata fra Danmarks Statistik.

Kilde: Danmarks Nationalbank.

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**THANK YOU!**