

## FINAL REPORT

**Project number:** 274678  
**Project title:** Frictions in the Housing Market  
**Project manager:** Nenov, Plamen  
**Activity / Programme:** FINANSMARK  
**Project owner:** STIFTELSEN HANDELSHØYSKOLEN BI

1. **Progress report:** Update progress report up to project completion date. Completed
2. **Final accounts:** Give a summary of the financial status of the project Completed
3. **Outcomes and impacts:** I understand that the information entered into the field for Outcomes and impacts will be made publicly accessible\* Completed
4. **Results report:** Attach results report Completed
5. **Other results:** List information about other results (publication in the media, organised events, newly established companies) Completed
6. **Special reports:** Any requests for special reports must be fulfilled. Have special reports been submitted? Not applicable
7. **Data management plan:** Has the final data management plan been uploaded? Completed

### Final accounts

#### Actual costs (in NOK 1000)

Account	2018	2019	2020	Total
Payroll and indirect expenses		268	274	542
Procurement of R&D services				0
Equipment				0
Other operating expenses	24	211		235
Sum	24	479	274	777

### Actual cost code (in NOK 1000)

Account	2018	2019	2020	Total
Trade and industry				0
Research institutes				0
Universities and university colleges	24	479	274	777
Other sectors				0
Abroad				0
Sum	24	479	274	777

### Actual funding (in NOK 1000 kr)

Account	2018	2019	2020	Total
The Research Council	185	33	17	235
Own financing		268	274	542
Public funding				0
Private funding				0
International funding				0
Deviations	161	-178	17	0
Sum	24	479	274	777

### Comments

Payroll and indirect expenses:

Total NOK 542.000 related to in-kind contribution according to 15% of fulltime position for Plamen Nenov during 2019-2020, covered by BI.

Specification of other operating expenses:

A total NOK 38.000 has been used to cover for travel costs through 2018-2019 (16.278,- for international conference/meeting and 21.710,- for researcher visit stay for Artashes Karapetyan at BI in 2019).

A total NOK 197.000 has been used to cover for purchase of data (2018: 7.424,-Brønnøysundregisteret, 2019: 107.388,- Ambita AS and 82.200,- SSB).

1. Give a summary of the financial status of the project

Completed

### Outcomes and impacts

**Anticipated outcomes and impacts - from the grant application form**

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### **Achieved and potential outcomes and impacts - based on the project results\***

We assemble a unique data set, which we combine with a novel shift-share instrument for changes in the market tightness in a local housing market. Using this shift-share design and quarterly neighborhood-level data, we show that local housing markets with a larger share of moving owners, which are thus more exposed to changes in the buy-first propensity, experience larger changes in house prices and time-to-sell. We, therefore, find that large moves in the buy-first propensity are responsible for around one-third of the fall in house prices in Oslo and Copenhagen during the 2008 global financial crisis. In terms of impact, we envision that the results obtained in this project would provide a new perspective on the drivers of house price volatility. Moreover, the project results have important policy implications regarding macro-prudential and stabilization policies aimed at the housing market.

5. I understand that the information entered into the field for Outcomes and impacts will be made publicly accessible\* Completed

### **Results report**

#### **Message to the Research Council of Norway**

**Original file :** final\_report.pdf

**File reference:** Resultat\_rapport11810505.pdf

2. Attach results report Completed

### **Other results**

**Please provide information about other results (Events, Publication in the media, Companies.**

3. List information about other results (publication in the media, organised events, newly established companies) Completed

### **Special reports**

**Alternative 1:**

**Alternative 2:**

**Original file :**

**File reference:**

4. Any requests for special reports must be fulfilled. Have special reports been submitted? Not applicable

## **Final data management plan**

**Original file :** NSD\_Datahaandteringsplan.pdf

**File reference:** DATAHAND\_Sluttrapport11810505.pdf

6. Has the final data management plan been uploaded?

Completed

## PROGRESS REPORT

**Project number:** 274678  
**Project title:** Frictions in the Housing Market  
**Project manager:** Nenov, Plamen  
**Activity / Programme:** FINANSMARK  
**Project owner:** STIFTELSEN HANDELSHØYSKOLEN BI  
**Project period:** 01.01.2018 - 31.12.2020  
**Report period:** 01.10.2020 - 31.12.2020

1. **Popular science presentation:** I understand that the text of the popular science presentation will be made publicly available\* Completed
2. **Results:** Has information on publications been provided? Yes
3. **Performance indicators:** All results data that have emerged from the project are to be reported. Has this been done? Yes
4. **Fellowship grants:** Information regarding all fellowship grants must be complete and correct. Have you updated the man-months and other information for each fellowship-holder? Yes
5. **International:** The extent of international cooperation is to be indicated. Has any international cooperation taken place during the report period? Yes
6. **Special reports:** If any requests for special reports have been put forth by the case officer at the Research Council, these must be fulfilled. No  
Have special reports been submitted?

### Popular science presentation

#### **Popular science presentation (Norwegian)**

Hvilke faktorer påvirker boligprisnivået og volatiliteten i boligmarkedet? En rekke forklaringer har blitt lagt fram, både fra adferdsøkonomer og neoklassiske økonomer. I dette prosjektet studerer vi empirisk en ny faktor, nemlig aktørenes valg av transaksjonsrekkefølge ved bytte av bolig, det vil si om de vil selge boligen de har først og deretter kjøpe en ny, eller om de vil kjøpe en ny først og deretter selge den gamle. Vi vil studere hvordan transaksjonsrekkefølgen varierer over de ulike fasene av boligsyklusen. Ideen er motivert av nyere teori som predikerer at endringer i transaksjonsrekkefølgen kan forsterke svingninger i boligprisene. Mer spesifikt vil aktørene ha incentiver til å kjøpe først og deretter selge i et hett marked, hvor etterspørselen allerede er sterk, og dermed ytterligere styrke etterspørselen og øke prisene. Når markedet er på vei ned vil det motsatte skje, aktørene selger før de kjøper, noe som i seg selv vil bidra til å forsterke nedgangen.

#### **Popular science presentation (English)**

What are the determinants of house price levels and their volatility? A number of behavioral and rational explanations have been put forward. In this project we empirically propose a new factor: examine moving homeowners transaction order, i.e. whether they want to sell the home they own

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first and then acquire a new one, or whether they want to buy a new one first and sell the old one later. Our study focuses on how this transaction order varies over the different phases of the housing market cycle. The idea is motivated by recent theory suggesting that the order of buying versus selling is crucial. In particular, the willingness to buy first and then sell in a booming market, where demand is already strong, will further strengthen demand and increase prices.

### **Popular science presentation - Updated (Norwegian)**

Hva er det som driver prisutviklingen og prisfluktuationene i boligmarkedet? En rekke teorier er lansert. I dette prosjektet analyserer vi betydningen av transaksjonsrekkefølgen ved flytting, det vil si hvorvidt boligeiere som flytter fra en bolig til en annen kjøper ny bolig før de selger den gamle eller motsatt. Vi benytter et omfattende datasett som gir detaljert informasjon om boligtransaksjoner i store byer i Norge. En viktig variabel i datasettet er andelen boligeiere som flytter lokalt, det vil si i samme bydel. Vi benytter en såkalt «shift-share» analyse. Vi finner at når andelen som kjøper før de selger nasjonalt går opp, påvirkes prisene mer i bydeler der mange flytter lokalt enn i bydeler der få flytter lokalt. Mer spesifikt finner vi at en 10 prosent økning i antallet individer som kjøper først nasjonalt øker prisene med 5 prosent mer, og reduserer tiden det tar å selge en bolig med 10 prosent mer, når andelen som kjøper først i en bydel øker med ett standardavvik. Vi argumenterer for at dette skyldes at stramheten i markedet, det vil si hvor mange kjøpere det er relativt til selgere, øker når flere kjøper først, og at effekten er særlig sterk i markeder der mange flytter lokalt. Effektene vi finner på boligprisene er betydelige. Som en illustrasjon kan omkring en tredjedel av boligprisfallet i Oslo og København under finanskrisen i 2008 tilskrives et fall i andelen som kjøpte før de solgte boligen sin.

### **Popular science presentation - Updated (English)**

What are the drivers of house price volatility? A number of behavioral and rational explanations have been put forward. In this project we use detailed transaction level and household data from Norway to show that the transaction sequence decisions of moving owners -- whether to buy first and then sell or vice versa -- impact house prices. An important variable in our analysis is the share of locally moving owners in a neighborhood, that is, the fraction of movers that both buy and sell their house in the same neighborhood. Using a shift-share design and quarterly neighborhood-level data, we show that local housing markets with a larger share of locally moving owners, which are thus more exposed to changes in the buy-first propensity, experience larger changes in house prices and time-to-sell. Specifically, a 10 percentage point decrease in the aggregate buy-first share causes house prices to fall by around 5 percent more and time-to-sell to increase by around 10 percent more in a location that has a one standard deviation larger share of locally moving owners. We argue that this is due to larger changes in the buyer-to-seller ratio (market tightness) in more exposed local housing markets. Moreover, we argue that large moves in the buy-first propensity are responsible for around one-third of the fall in house prices in cities like Oslo and Copenhagen during the 2008 global financial crisis.

6. I understand that the text of the popular science presentation will be made publicly available\* Completed

## **Message to the Research Council of Norway**

## **Results**

**Please provide information about scientific publications, other publications and lectures by retrieving information registered in CRISStin. Manual registration by 'Select type' must only be used if the publication cannot be registered in CRISStin pursuant to the applicable rules.**

Type					
Other publication					
Author(s)*	Title*	Data Archive/Repository	Year*	ISSN/ISBN	DOI
K. Anundsen, André; Lyshol, Arne; Nenov, Plamen; Erling Røed Larsen, and	Match Quality and House Price Dispersion: Evidence from Norwegian Housing Auctions	Chapter 3 in Essays in labor and housing search (PhD thesis of Arne Lyshol)	2020	978-82-8247-158-9	

Type					
Dissemination					
Author(s)*	Title*	Journal/newspaper	Year*	ISSN/ISBN	DOI
Grindaker, Morten; Karapetyan, Artashes; R. Moen, Espen; T. Nenov, Plamen	Transaction Sequence Decisions and Housing Market Volatility: Evidence from Norway	2020 Meeting of the Urban Economics Association	2020		

Type					
Dissemination					
Author(s)*	Title*	Journal/newspaper	Year*	ISSN/ISBN	DOI

Grindaker, Morten; Karapetyan, Artashes; R. Moen, Espen; T. Nenov, Plamen	Transaction Sequence Decisions and Housing Market Volatility: Evidence from Norway	Working Paper	2019		
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Type

Dissemination

Author(s)*	Title*	Journal/newspaper	Year*	ISSN/ISBN	DOI
Grindaker, Morten; Karapetyan, Artashes; R. Moen, Espen; T. Nenov, Plamen	Transaction Sequence Decisions and Housing Market Volatility: Evidence from Norway	BI Economics Department Internal Seminar	2019		

Type

Dissemination

Author(s)*	Title*	Journal/newspaper	Year*	ISSN/ISBN	DOI
Grindaker, Morten; Karapetyan, Artashes; R. Moen, Espen; T. Nenov, Plamen	Transaction Sequence Decisions and Housing Market Volatility: Evidence from Norway	12th World Congress of the Econometric Society	2020		

Type

Dissemination



Author(s)*	Title*	Journal/newspaper	Year*	ISSN/ISBN	DOI
Grindaker, Morten; Karapetyan, Artashes; R. Moen, Espen; T. Nenov, Plamen	Transaction Sequence Decisions and Housing Market Volatility: Evidence from Norway	35th Congress of the European Economic Association	2020		

Type

Dissemination

Author(s)*	Title*	Journal/newspaper	Year*	ISSN/ISBN	DOI
K. Anundsen, André; Lyshol, Arne; Nenov, Plamen; Erling Røed Larsen, and	Match Quality and House Price Dispersion: Evidence from Norwegian Housing Auctions	Working Paper	2020		

Type

Dissemination

Author(s)*	Title*	Journal/newspaper	Year*	ISSN/ISBN	DOI
K. Anundsen, André; Lyshol, Arne; Nenov, Plamen; Erling Røed Larsen, and	Match Quality and House Price Dispersion: Evidence from Norwegian Housing Auctions	BI Economics PhD Seminar	2020		

5. Has information on publications been provided? Yes

## **Performance indicators**

Results	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Cumulative number
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### **Dissemination measures for users**

Reports, memoranda, articles, presentations held at meetings/conferences for project target groups (public sector, trade and industry, organisations)

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2. All results data that have emerged from the project are to be reported. Has this been done? Yes

## **Fellowship grants**

### **Fellowship grants funded under the project**

1. Information regarding all fellowship grants must be complete and correct. Have you updated the man-months and other information for each fellowship-holder? Yes

## **International cooperation**

### **International cooperation funded under the project (in NOK 1000)**

#### **Amount in NOK 1000**

Country	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
France		22	247							

3. The extent of international cooperation is to be indicated. Has any international cooperation taken place during the report period? Yes

## **Special reports**

**Alternative 1:**

**Alternative 2:**

**Original file :**

**File reference:**

4. If any requests for special reports have been put forth by the case officer at the Research Council, these must be fulfilled. Have special reports been submitted? Not applicable

# Results Report for Project 274678 - Frictions in the Housing Market

January 29, 2021

## **Project objective**

Housing markets are the prime example of a decentralized asset market, with slow arrival of trading counter-parties and substantial trading delays. A large and growing literature in economics and finance has focused on understanding the implications of such frictional trading for house prices and housing market dynamics more generally using models from search theory. A central idea in that search-based literature of the housing market is that the ratio of buyers-to-sellers, the market tightness, plays a key role in determining both time-to-sell and house prices. Whether due to higher seller outside options or higher frequency of bidding wars among buyers, a higher buyer-to-seller ratio is predicted to increase house prices and lower seller time-on-market. Nevertheless, despite being a central prediction of these models, there has been little empirical evidence to corroborate these effects of market tightness. However, recent theoretical work by Moen, Nenov and Sniekers (Moen et al. (forthcoming)) argues that the transaction sequence decisions of moving owners -- whether to buy the new property first and then sell the old home or vice versa -- may have a large impact on housing market volatility through their large effects on market tightness. Therefore, motivated by this work, the main objectives of this project are to assemble a unique data set of homeowner transaction histories and develop a novel empirical strategy based on insights from Moen et al. to provide empirical evidence for the effects of transaction sequence decisions and market tightness on house prices and seller time-on-market.

## **Results and impact**

The main results from this project are included in a working paper titled “Transaction Sequence Decisions and Housing Market Volatility: Evidence from Norway” (Grindaker et al., 2020). Here we briefly summarize these results

- We assemble a unique data set that consists of individual level housing transaction data for the period 1993-2017 for the four main cities in Norway: Oslo, Bergen, Stavanger and Trondheim (plus surrounding municipalities in the cases of Oslo and Stavanger), data on collateralizations (“panterett”) for the same period and the municipalities of Oslo, Bærum, Bergen and Stavanger as well as individual balance sheet data for all individuals transacting housing in Oslo, Bærum, Bergen and Stavanger for that period.
- We show new evidence that moving owners choose their transaction sequence. We document substantial heterogeneity across households in their propensity to buy first, both related to the age and the size of the household. Older households and couples with children are more likely to buy first compared to younger or single households (or couples without children). Moreover, we document that household balance sheet composition correlates strongly with the propensity to buy first. Specifically, buying first comoves positively with liquid assets (bank deposits) and negatively with household leverage.
- We develop a novel shift-share instrument for changes in the market tightness in a local housing market. In terms of empirical implementation, we compute the (time-averaged) ratio of locally moving owners to other transacting agents in a local housing market and interact it with the quarterly changes in the *aggregate* buy-first share (the share of moving homeowners that buy first in a given quarter), which proxy for shocks (which are plausibly exogenous from the perspective of a local housing market) to the buy-first propensity.
- Using this shift-share design and quarterly neighborhood-level data, we show that local housing markets with a larger share of moving owners, which are thus more exposed to changes in the buy-first propensity, experience larger changes in house prices and time-to-sell. Specifically, a 10 percentage point decrease in the aggregate buy-first share causes house prices to fall by around 5 percent more and time-to-sell to increase by around 10 percent more in a location that has a one standard deviation larger share of moving owners.
- We build a simple model with a transaction order decision and combine it with our reduced-form estimates to calibrate a key parameter for search models of housing -- the elasticity of house prices to market tightness. Through this methodology we obtain an elasticity of house prices with respect to market tightness of around 0.4.
- We use this calibrated model to obtain the city-level counterfactual effect of changes in the propensity to buy first on house prices. Our counterfactual calculation gives a city-level semi-elasticity of house prices to changes in the buy-first share of 0.22. We

conclude that drops in the propensity to buy first can explain a sizable share (around 30%) of the drop in city-level house prices for Oslo and Copenhagen during the 2008 financial crisis.

In addition, in a working paper titled “Match Quality and House Price Dispersion: Evidence from Norwegian Housing Auctions” (Anundsen et al., 2020) we provide evidence of owner heterogeneity by type of housing. Specifically, we show that in Oslo owners of houses are substantially more homogeneous in terms of age and household status compared to owners of apartments.

In terms of impact, we envision that the results obtained in this project would provide a new perspective on the drivers of house price volatility once our working papers are published in peer-reviewed journals (see below for a brief description of dissemination and results that remain to be finalized). Moreover, the project results have important policy implications regarding macro-prudential and stabilization policies aimed at the housing market. The empirical finding that the propensity to buy first drives house prices and increases both aggregate house price volatility and the cross-sectional dispersion of house prices implies that policies regulating the transaction order of moving owners (for example, via regulation of bridge loan prices and availability, which are used by owners that buy first) are a key new tool for macro-prudential policy aimed at stabilizing house price fluctuations.

## **Implementation**

As detailed in the final budget the bulk of the funds received have been used for the purchase of data used in the construction of our unique data sets. Specifically, a total NOK 197.000 has been used to cover for purchase of data (2018: 7.424,-Brønnøysundregisteret, 2019: 107.388,- Ambita AS and 82.200,- SSB). In addition, a total NOK 38.000 has been used to cover for travel costs through 2018-2019 (16.278,- for international conference/meeting and 21.710,- for researcher visit stay for Artashes Karapetyan at BI in 2019). Finally, a total of NOK 542.000 have been contributed by BI in terms of in-kind contribution according to 15% of fulltime position for Plamen Nenov during 2019-2020.

## **Dissemination**

Despite the COVID pandemic, which has hindered international travel and has led to several conferences being canceled, we have made our best effort to disseminate the project results as widely as possible. First, the working paper “Transaction Sequence Decisions and Housing Market Volatility: Evidence from Norway” was presented in 2020 at several top

international conferences such as the 12th World Congress of the Econometric Society, the 35th Congress of the European Economic Association and the 2020 Virtual meeting of the Urban Economics Association. The paper was selected for the plenary sessions of two more conferences, the SNDE 2020 conference in Zagreb and the Search and Matching 2020 conference in Copenhagen. However, due to COVID, neither of the authors could travel to the first conference, while the second conference was canceled. In 2019 the paper was also presented at the BI Economics Department Internal seminar. The working paper “Match Quality and House Price Dispersion: Evidence from Norwegian Housing Auctions” was presented at the BI Economics PhD seminar and was also part of the PhD thesis for Arne Lyshol.

Given the topic of the project, it is naturally of great interest to the general public and to policy making institutions such as Norges Bank. Therefore, we have been working towards presenting the project results to the wider public and policy makers at Norges Bank. In terms of dissemination to the general public, our plan has been to prepare feature articles (“kronikker”) that can be published by Norwegian business media, such as the periodical “Dagens Næringsliv”. In 2020 I wrote an article in “Dagens Næringsliv” together with Espen Moen on the theory behind the main empirical question that we answer in the project (Moen and Nenov, 2020). That article also mentions preliminary results from this project. We are currently working on a follow-up article which will feature a non-technical summary of the results in “Transaction Sequence Decisions and Housing Market Volatility: Evidence from Norway” together with a discussion of the possible policy implications and implications for developments in the Norwegian housing market post-COVID.

In addition, we are planning to present the results of the project at an internal seminar in Norges Bank, where I hold a part-time position, as well as to members of the Financial Stability division at Norges Bank. This part of the dissemination plan has, unfortunately, been slowed down by the COVID pandemic, since non-essential Norges Bank employees, such as those in part-time positions, have not been allowed at Norges Bank, while employees working in the policy divisions of the Bank have been unusually busy in this period. Once the situation around the pandemic has normalized and physical internal seminars are allowed again at Norges Bank, I plan to proceed with that part of the dissemination plan.

## **Results remaining to be finalized**

The paper “Transaction Sequence Decisions and Housing Market Volatility: Evidence from Norway” is almost ready for journal submission with only a few robustness exercises remaining to be completed. It will be submitted in Spring 2021. Given the usual turnaround times in Economics, it is expected that the paper will be finally published in 2023. The paper “Match Quality and House Price Dispersion: Evidence from Norwegian Housing Auctions” requires some additional analysis and dissemination before journal submission. The

estimated submission time is in Fall, 2021 with expected paper publication in 2023-2024.

## References

Anundsen, André, Arne Lyshol, Plamen T Nenov, and Erling Røed Larsen (2020). “Match Quality and House Price Dispersion: Evidence from Norwegian Housing Auctions.” Tech. rep.

Grindaker, Artashes Morten, Karapetyan, Espen R Moen, and Plamen T Nenov (2020). “Transaction Sequence Decisions and Housing Market Volatility: Evidence from Norway.” Tech. rep.

Moen, Espen R and Plamen T Nenov (2020). “Kjøpe først eller selge først i boligmarkedet?” *Dagens Næringsliv*.

Moen, Espen R, Plamen T Nenov, and Florian Sniekers (forthcoming). “Buying first or selling first in housing markets.” *Journal of the European Economic Association*.