WORKING PAPER 2025:23

Housing by chance: The academic impacts of lottery-based access to student accommodation

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ISSN 1651-1166

Housing by chance: The academic impacts of lottery-based access to student accommodation*

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December 4, 2025

Abstract

The affordability and stability of housing are key determinants of economic well-being, but their effects on the academic success of university students remain underexplored. This paper investigates the causal effect of early access to affordable student housing on academic performance using a unique lottery-based allocation system in Sweden. The findings show that early access to student housing significantly improves students' academic performance, with grades increasing by 28% of a standard deviation, and students being 33% more likely to rank in the top 5% of their class. The results suggest that housing stability allows students to focus more on their studies, reducing the need for employment and long commutes.

Keywords: Student Housing, Higher Education, Test Scores
JEL Classification: I21 ,I23, R21, C93

*I am grateful to Petter Lundborg, Therese Nilsson, Ana Rodríguez-González, Caroline Hall, Eva Ranehill, Matz Dahlberg, and Petra Persson for their invaluable comments and suggestions on this paper. I would also like to thank the seminar participants at Lund University and Copenhagen Education Network for their insightful feedback. Special thanks to Camilla Jönsson at Ladok, and to Claes Hjortronsteen and Alexander Gahnström at AF Bostäder for providing the data. I gratefully acknowledge the financial support from Stiftelsen Lars Hiertas Minne and Stiftelsen för främjande av ekonomisk forskning vid Lunds Universitet.

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1 Introduction

Housing (un)affordability is a global problem with harmful consequences for the economy, including rising income and social inequality, limitations in labor mobility, and potential negative effects on economic growth (UN Habitat, 2015; Albouy et al., 2016; Glaeser and Gyourko, 2018; Hsieh and Moretti, 2019; Dustmann et al., 2022). Meanwhile, the demand for accommodation among university students is increasing as more students than ever attend university to pursue higher education. This has put pressure on housing markets as the current supply cannot meet the growing need for accommodation and has left students facing relatively higher rents (The Guardian, 2023). Experiencing housing insecurity, such as moving several times in a year, defaulting on rent or mortgage, short contracts, and sharing accommodation with others due to financial difficulties, personal support needs, convenience, or social and emotional reasons, is not uncommon among university students (Goldrick-Rab et al., 2017; Broton and Goldrick-Rab, 2018; Hallett and Freas, 2018; Broton et al., 2022; SFS, 2024).[1] This instability can negatively affect student performance and reduce the accumulation of human capital (Silva et al., 2017).

To help students find affordable accommodation, many universities offer various housing options, including dormitories both on- and off-campus, as well as facilitating access to affordable units through special agreements with partner housing companies. These accommodations typically feature

[1] In Sweden, which is the context of this paper, housing insecurity is a pressing issue for university students. Seventy percent of students live in cities that cannot offer them suitable accommodation during the fall semester (SFS, 2024). Furthermore, 1 in 4 students declines a university offer due to the lack of available housing at their place of study (Sveriges Radio, 2024). The severity of the crisis has led to a recent motion in the Swedish Parliament, calling for urgent reforms to student housing policies and increased investment in student housing units (Riksdagen, 2022). This paper studies the effect of a student housing lottery in Lund, one of the cities where student housing shortages are particularly problematic.

two key advantages: they are usually more affordable than other options of similar size and location, and they are more accessible, as many admitted university students qualify to apply for them. Yet, almost no causal evidence exists on the effects of gaining access to student housing on the students' outcomes. A key challenge is that access to student housing and the timing of this access is often not randomly assigned but rather based on more or less explicit criteria. Simply comparing outcomes between students who live in student housing and those who either do not or move in later during the academic year fails to yield causal estimates, as they may systematically differ in terms of unobservable characteristics.

This paper evaluates the impact of early access to affordable student housing on educational achievement. To identify a causal effect, I exploit a student housing lottery in Sweden that effectively randomized the probability that a student gained access to affordable student accommodation at the beginning of the academic year. Using this lottery, I study how access to student housing and its timing affect short-term academic outcomes for incoming students. Since the lottery rank is unrelated to the background characteristics of the students, this ensures that the variation in the time to receive accommodation is independent of other factors that may affect the students' educational outcomes.

The affordability of the housing units offered by this lottery and the stability of the subsequent housing arrangements may play an important role in influencing various aspects of the students' lives such as their well-being and performance at university. Early access to housing may reduce the stress and uncertainty of finding a place to live, allowing students to focus on their coursework from the beginning of the semester. It might also support better time management, helping students establish consistent routines and devote more attention to both academic and extracurricular ac-

tivities. Moreover, early access to housing, or the lack thereof, could affect their decisions to work while studying, and thereby time allocation, and consumption behavior.[2] I hypothesize that access to affordable housing at the start of the academic year may have a positive impact on students' grades and degree progression. To my knowledge, this paper is the first to exploit exogenous variation in the timing of access to affordable and stable student housing and examine its impacts on educational outcomes in a university setting. Furthermore, it explores variations in the responses of different types of students to potential housing instabilities. I also investigate some mechanisms through which the effects may arise. The results have significant policy implications, as the potential effects on study performance may impact human capital accumulation and long-term economic outcomes in life (Card, 1999; Zhang, 2008; Freier et al., 2015; Kirkeboen et al., 2016).

For my analyses, I use unique data from a housing lottery in one of Sweden's largest university towns, Lund, combined with Swedish register data. The lottery was held by a university-affiliated company before the start of the academic year 2022/2023 and assigned a random rank to each of the 2,546 participants who were newly admitted university students. The ranks determined the participants' priority for access to student accommodation, which effectively randomized the timing of receiving housing offers. Additionally, I use university register data to measure students' academic results. Linking these datasets enables me to estimate the impact of exogenous variation in the likelihood of obtaining student housing by the start of the academic year on educational outcomes and to explore which students were most affected. Furthermore, I conducted monthly surveys

[2]Previous research has shown that such factors can have a notable effect on students' outcomes (Card, 1995; Nonis and Hudson, 2006; Rothstein, 2007; Callender, 2008; Wenz and Yu, 2010; Darolia, 2014; Baert et al., 2018).

among lottery participants to investigate the channels through which they might have been impacted.

I find that having a better lottery rank strongly increases the probability of having student accommodation at the beginning of the studies and that in general, a better rank is associated with a shorter waiting time. Given the supply of housing units each month, participants with the first 200 positions in the rankings would be more likely to receive affordable student accommodation before the start of the semester. Then, I exploit this exogenous variation in having student accommodation at the beginning of the studies to study the impact of early access to student housing on grades. My main results show a positive causal effect of residing in affordable student housing at the start of studies on standardized grades, equivalent to an increase of 28% of a standard deviation, a notable effect in magnitude. Moreover, early access to student accommodation units increases the probability of ranking in the top 5 and top 10 percentile of a course grade distribution by approximately 33% and 43%, respectively. Upon dividing the analysis into different groups, the effects are mainly present in the sample of incoming international students. The effect of having student accommodation for this sample corresponds to an increase of 32% of a standard deviation.

Using the data collected by the survey, I investigate potential mechanisms. I find that the students who did not receive student accommodation are more likely to live outside of the city. Long commutes have been shown to be associated with less engagement in education which has in turn been found to negatively affect the students' academic achievement (Braxton and Hirschy, 2005; Kuh et al., 2008; Kobus et al., 2015). Moreover, the participants who secured student accommodations at the onset of their university studies are less likely to engage in student employment, which can act as a potential mechanism affecting educational outcomes. While

student employment can be a complement to education through learning-by-doing, most studies have found negative and in some cases non-linear effects of student employment on academic achievement (Stinebrickner and Stinebrickner, 2003; Kalenkoski and Pabilonia, 2010; Neyt et al., 2019). Furthermore, while access to student housing decreases the probability of living with roommates, it does not play a role in students' social lives and there are no statistical differences in the number of times they meet up with their peers for social purposes. Lottery participants who gained early access to student housing also experience greater housing stability, measured by the duration and type of contract. Their rental contracts are legally protected, direct agreements with the landlord, covering the entire duration of their studies and offering a relatively short notice period.

My paper contributes to several strands of literature. Primarily, it is closely related to research investigating the causal determinants of college performance and success, particularly the small body of work examining the impact of student living arrangements on educational outcomes. Reynolds (2020) focuses on the effect of living in on-campus dormitories on students' outcomes, finding a positive effect on GPAs but a null impact on student retention. Similarly, Turk and González Canché (2019) finds no effects of living on-campus on associate degree completion. These studies suggest mechanisms such as better student integration and peer effects to explain the observed relationship between living arrangements and academic achievement. My paper extends this literature by examining off-campus housing units, which may not involve shared accommodations with peers, providing a broader context for understanding the dynamics of student living and academic outcomes.

More broadly, research on policies and factors aimed at improving college retention, degree completion, and academic performance among univer-

sity students has produced mixed results. Some studies indicate that academic support services, financial aid, grade incentive programs, adjunct instructors, and increased faculty-student engagement can improve academic achievement (Angrist et al., 2009; Bettinger and Long, 2010; Angrist et al., 2014; Carrell and Kurlaender, 2023; Murphy and Wyness, 2023). Additionally, psychological interventions designed to enhance students' mindsets and sense of belonging have shown positive effects on grades, particularly for disadvantaged groups (Walton and Cohen, 2011; Murphy et al., 2020). However, other interventions, such as providing performance feedback, have been found to negatively impact grades (Azmat et al., 2019), while coaching focused on mental health and study time, as well as increases in tuition fees, have shown no significant effects on educational outcomes (Fricke, 2018; Oreopoulos and Petronijevic, 2019).

The student housing lottery system offers a credible method for estimating the causal effects of housing on educational outcomes, as well as other factors like employment. This study contributes to a small but growing body of research examining the impact of housing lotteries and waiting lists, which has been relatively underexplored. Previous studies have mainly focused on the effects of access to social housing. While some evidence suggests that social housing lottery winners experience improvements in housing quality, income, and education over a period of 3 to 5 years (Kumar, 2021), other studies indicate that these positive outcomes are concentrated among those who secure housing in high-income neighborhoods (Van Dijk, 2019). Moreover, Öst and Johansson (2023) show that randomly receiving an apartment with a rent-controlled contract negatively affects the annual income and employment in Sweden. What sets this paper apart from previous studies in the field of housing lotteries is twofold. First, it focuses on university students, whereas previous research predominantly

targets family units. University students represent a unique demographic with different priorities and challenges compared to families. Their academic performance, time management, and life decisions—such as whether to work during their studies—are likely more sensitive to housing stability and timing. Second, the housing units offered to students in this context are of a temporary nature, lasting only until the completion of their studies. This introduces a clear, short-term window during which housing can directly impact their educational experience which offers insights into how such short-term interventions can affect students' academic performance and decision-making.

More generally, this paper contributes to the literature that assesses the role of in-kind transfers in educational achievement. In this context, opting for student housing is cheaper than renting accommodation in the private housing market, thus it incorporates an element of in-kind transfer. Previous studies examining the effects of different welfare programs, specifically in-kind transfers, on recipients' life outcomes have yielded varied conclusions. While some research suggests these programs may positively influence low-income children's academic performance, others indicate they have little, if any, impact on students' grades (Currie, 1994; Jacob et al., 2015; Chetty et al., 2016). Lundborg et al., 2022 and Bütikofer et al., 2018 find that the provision of free and universal nutritious food in schools has positive effects on health and educational attainment in early adulthood. This paper contributes to the existing literature on welfare policies by examining the influence of student housing, conceptualized as an in-kind transfer, on academic achievement. Exploring the relationship between affordable housing initiatives and the educational outcomes of university students, this study fills a gap in understanding how welfare policies in the form of housing assistance intersect with educational outcomes when the target population

is students in higher education.

The remainder of the paper proceeds as follows: Section 2 introduces the student housing lottery system and details the process for participating in it. Section 3 outlines the data and the survey. Section 4 describes the empirical strategy employed. Section 5 provides the main estimates for the effects of student housing on educational outcomes and some tests for the robustness of the results. Section 6 explores potential mechanisms driving these effects. Section 7 concludes.

2 AF Bostäder housing lottery

In this section, I describe the institutional context, the types of housing available to students, and the structure and rules of the lottery system, including how students can participate, the conditions they must meet, and the implications of their lottery results.

Lund Municipality, located in southern Sweden, has a population of approximately 125,000 people, with nearly half of its population being students, making it a true "university city". Its proximity to major urban centers, being very close to Copenhagen, offers students the advantage of a smaller, quiet academic environment while providing easy access to larger cities. Lund University, established in 1666, is consistently ranked as one of the top three universities in the country (QS World University Rankings, 2024). With over 40,000 students, it is among the largest universities in Sweden (Swedish Higher Education Authority, 2023). The university offers a wide range of undergraduate and graduate programs across various disciplines in both English and Swedish, making it a popular choice for both Swedish and international students. In addition to its full-time student population, Lund University also hosts hundreds of exchange students from different

locations every year. Through partnerships with over 600 universities globally, the university offers students the chance to study at Lund University for one or two semesters.

The university operates on a two-semester system, with the academic year starting at the beginning of September for the fall semester and in mid-January for the spring semester. For the fall semester, there are two admission rounds: the first round, primarily for international students, with admission results usually published by April; and the second round, which is more common for the Swedish, European Union (EU), and the European Economic Area (EEA) students, with results announced by July. Many English-taught courses and programs are only available in the first round, limiting options in the second round.[3]

The large student population and the absence of a centralized campus have contributed to a significant housing shortage and rising rents in recent years in Lund, particularly affecting newly admitted students (see Figure A1a and Figure A1b). In Lund Municipality, the students have three primary options for securing housing, each based on different eligibility criteria: The first option is LU Accommodation, which is part of Lund University and offers off-campus housing in Lund, Helsingborg, and Malmö. Although LU Accommodation does not own these properties, they work with private landlords, and the contracts are always signed directly between the student and LU Accommodation. This type of housing is available to students from countries outside the EU/EEA, as they generally have to pay tuition fees, making them eligible for LU Accommodation. Students from the EU/EEA, along with PhD candidates and exchange students, who do not have to pay tuition, are not eligible for LU Accommodation.

[3]The EEA (European Economic Area) includes all EU member states along with Norway, Iceland, and Liechtenstein, allowing these countries to participate in the EU's internal market without being EU members.

The second option is the private housing market. However, the short time frame between the announcement of admission results, which is either in late March or July, and the start of the semester in September might make it difficult for students to find suitable housing on their own before the semester begins. Sweden has a heavily regulated rental market that mostly operates on a queue-based system, requiring individuals to join a city's rental queue and often wait years for a first-hand rental contract.[4] It is likely that some incoming international students are unaware of this system, making it challenging for them to secure housing. Consequently, both international and Swedish students often rely on alternative methods, such as unofficial Facebook groups and housing websites.

The third option is through AF Bostäder, a university-affiliated company. All newly admitted students are eligible to apply for housing through this service, regardless of whether they are Swedish or international.AF Bostäder (AF) is a non-profit foundation located in Lund Municipality, Skåne and the largest student housing provider in southern Sweden. It offers over 6,000 housing units across various residential areas in Lund. Nearly half of these units are corridor rooms with shared communal areas like a kitchen and living room, and the rest are apartments with one to four rooms. AF's centrally located buildings, first-hand contracts and reasonable rents make them an attractive option for students. These units are generally more affordable than comparable options in both Lund and the broader Swedish private housing markets. Figure 1 illustrates the percentage difference in average rents for AF-provided student housing compared to other rental units in Lund and across Sweden, broken down by apartment type. The figure shows that AF's units are significantly more affordable

[4]In Sweden, first-hand rental contracts are leases directly between tenants and property owners, offering long-term tenancy rights and stability. These contracts typically provide stronger legal protections for tenants, including regulated rent increases and security of tenure.

than comparable units in Lund's private rental market, making them highly popular among students.

Every July, after the admission results are announced but before the academic year begins, AF conducts an online lottery for new incoming students, randomly assigning ranks to the participants to determine their priority for receiving housing. The university promotes this lottery as a viable housing option on its website. Eligible students have a two-day registration period to sign up for the lottery, provided that they have not resided in the Skåne region (where the university is located) in the 12 months preceding the lottery and have not previously studied at Lund University. After the registration period ends, the lottery is conducted, and participants receive their results the following day. Each participant is assigned a date and time stamp in the format $YYYY-MM-DD \quad HH:MM$ as their lottery outcome. An earlier stamp indicates a better queue position and, consequently, higher priority for receiving housing. [5] However, since participants' lottery timestamps are not disclosed to one another and the exact range of possible timestamps is unclear, they remain unaware of how "good" or "bad" their queue positions are.[6] I exploit this random assignment process in my study to estimate the effects of housing access at the beginning of the semester on various outcomes.

After the lottery, AF lists available units on its website, where all lottery participants can express their interest. Each unit has a specific application period during which students can sign up. The priority for securing a unit is based solely on the queue position assigned by the lottery, not the time of application. The student with the best queue position (earliest times-

[5]The random lottery numbers are generated in-house by AF Bostäder's IT system using standard Java programming. A random number is assigned and then converted into a queue date, starting from the earliest possible time for novisch students.

[6]While students could compare their timestamps with one another, this is unlikely, as they typically would not have met before the semester starts.

tamp) among those who expressed interest will receive a contract proposal from AF which can be accepted or declined by the student. Students are limited to applying for only three available housing units at any given time, and each application is binding. Once a unit is allocated to an applicant, their queue position is de-registered. Although students have the option to decline the contract proposal, this will result in the loss of their lottery rank and their opportunity to be considered for another unit offered in the lottery.

In the 2022/2023 academic year, nearly 7,500 students began their undergraduate and graduate studies at the university during the Fall semester. A total of 2,546 students registered for the AF housing lottery and were assigned a random queue position (see Table 1). From August, AF provided several housing units to the lottery participants each month, as shown in Table 2. As a result of the lottery, 208 students secured accommodation through AF by the start of the academic year, before September 2022. By May 2023, the number of students residing in AF accommodation had increased to 985.

3 Data

3.1 Lottery outcomes

In collaboration with AF Bostäder, I gather novel data on queue positions and rankings of lottery participants, as well as their accommodation status, including whether and when they secured a unit from AF Bostäder. This dataset includes details such as location, type, and size of the accommodation. Using this information, I analyze the impact of lottery rank on the likelihood of obtaining student housing. The primary binary treatment variable was constructed based on the start date of each participant's

rental contract, indicating whether the participant secured an apartment from AF Bostäder at the beginning of the academic year by September 2022. The data covers the housing contracts for lottery participants starting from August 1, 2022, to May 1, 2023. During this time, a total of 985 participants received student housing through AF. Specifically, AF made 213 units available for rent starting in August 2022, with 208 participants securing their units before the start of the academic semester in September 2022 (see Table 2).

3.2 Educational outcomes

Most current literature on higher education focuses on the degree completion of university students, primarily due to a lack of access to detailed grades for each student in each course. In this study, I have collected data on the lottery participants' grades and their class rankings among their peers in specific courses, allowing for a more granular analysis of academic performance.

To construct educational profiles, I collect register data from Ladok, Sweden's national system for recording students' educational histories. Ladok provides comprehensive educational metrics, including individual and peer performance indicators such as grades, enrolled courses, credits earned, examination dates, and fields of study. The data spans up to July 2023, the end of the lottery participants' first academic year.

Certain exams use detailed grading systems, such as percentage scales or the A-E grading system, while others only indicate pass or fail. The latter (pass/fail exams) are excluded from this analysis. To make students' academic performance comparable, grades on the A-E scale are converted to their equivalent percentage ranges, with each letter grade represented

by the mean value of its corresponding range (see Table A1). Both the converted grades and those initially given on a percentage scale are then standardized. Following this, weighted average grades are calculated based on the number of credits (ECTS) for each course.[7,8] Since ECTS credits reflect the workload and relative importance of each course, they are used to weight the grades when calculating the GPA. This is because ECTS credits are designed to standardize student workload across courses and institutions in Europe, with each credit representing approximately 25 to 30 hours of total work, including lectures, assignments, and self-study. As a result, courses with more ECTS credits require a higher workload and have a larger influence on a student's overall academic performance. All steps are done separately for the first two semesters and cumulatively for the entire first year.

Each standardized grade is used to determine a student's rank in a course and whether their grade falls within the top 5% or top 10% of the class. If a student is in the top 5% of the grade distribution, a dummy variable for the top 5% is set to one. The same process is followed for the top 10%. These dummy variables for the top 5% and top 10% are then weighted by the number of credits for each course to account for the importance and workload of the course when calculating the overall performance, and weighted averages are subsequently calculated.

After calculating the weighted averages, the variables "top 5%" and "top 10%" represent the proportion of times a student ranked in the top 5% and top 10% of their courses, respectively. These variables are no longer simple dummy variables; they reflect the weighted share of instances where

[7]The grade standardization was done separately for each course and using all of the students who took the exam for a certain course. However, the sample used in the analysis is the sample of lottery participants. Therefore the mean of the grades is no longer 0 across the used sample.

[8]ECTS: European Credit Transfer and Accumulation System credits

a student achieved top rankings, taking into account the credit value of each course. For simplicity, I refer to these variables as "top 5%" and "top 10%". These data were subsequently forwarded to Statistics Sweden for anonymization, where each participant received a distinct identifier to later link them to the register data.

3.3 Survey

Two surveys were designed to collect essential data on the participants' housing preferences, social activities, and accommodation status. The purpose of these surveys is to study potential mechanisms through which educational outcomes are affected.

Survey I, illustrated in Figure A4, was sent to all lottery participants in July 2022 via email on the day the lottery results were announced and before the housing units became available for application submissions. Participants were asked to identify the most important aspect of accommodation for them, with options including rent, distance to faculty, size, and state of the building (e.g., newly renovated). Moreover, they were requested to rank their accommodation preferences from 1 to 4, the most preferred being 1. The available AF housing options that they had to rank consisted of corridor rooms, studio apartments, one-bedroom apartments, and two-bedroom apartments. They were reassured that participation in this study is voluntary and will not affect their position in AF housing queue, accommodation eligibility, and accommodation allocation.[9] After excluding invalid and duplicate responses, 182 students participated (equivalent to a response rate of 7.1%).[10] Among these, 59% were women, and 80% were

[9]To boost participation, participants were informed in the survey email that twenty cinema tickets would be offered to ten randomly chosen respondents.

[10]The number of participants in Survey II for each month from September to February is 256 (10.05%), 336 (13.20%), 455 (17.87%), 229 (8.99%), 141 (5.54%), and 224 (8.80%), respectively.

enrolled in a bachelor's program. The results showed that 46% of participants considered rent the most important factor for housing, followed by 41% who prioritized distance to faculty. The most preferred type of accommodation was studio apartments, with nearly half of the participants selecting it as their top choice (see Table A3 in the appendix).[11]

Survey II, as shown in Figure A5, was sent to all lottery participants every month from September 2022 to February 2023. This survey tracked participants' housing situations, including the location, duration, and type of their current housing contracts, the notice period (i.e., the amount of time a tenant must provide before ending their rental agreement), and, for those not residing in AF housing, the reasons for this choice. This information provides insights into students' housing insecurity and whether the accommodation situation was due to personal choice or low placement in the housing queue. Additionally, both groups—those in AF housing and those not—were asked about their time spent on social activities and part-time/full-time jobs to understand how they allocate their time outside of studying.[12] Over the survey period, a total of 1,621 responses were received from 874 unique individuals, resulting in a response rate of 34.33%.

3.4 Register data

In parts of my analyses, I use the population register from Statistics Sweden to add comprehensive information about the demographics, employment status, income levels, and parental backgrounds of the lottery participants. This register includes data on participants who have been living and are registered in Sweden, primarily comprising Swedish nationals.

[11]Due to the small number of individuals who participated in Survey I, its results are not used to draw strong conclusions and should be interpreted with caution.

[12]To encourage participation, participants were informed that one randomly selected respondent would receive a 1,000 Swedish Krona (approximately $100) Amazon Sweden gift card at the end of each survey.

For 1,246 participants—about 50% of the total number of lottery participants—I obtain detailed data on individual characteristics such as age, gender, nationality, employment status, income, and city of residence. Additionally, information on their parental backgrounds, including the highest level of education, income, age, and city of residence, is collected. Data for the remaining participants are unavailable since many had recently moved to Sweden from other countries and their information was not collected or stored in Swedish registers.

3.5 Sample selection and descriptive statistics

As illustrated in Table 1, the main sample for my analysis consists of 1,802 lottery participants who completed at least one course with a detailed grade in the Fall semester of the 2022/2023 academic year, representing 70% of all participants.[13] In other words, 70% of the participants received at least one grade on a percentage or A-E scale, while the remaining 30% either took pass/fail courses without detailed grades or did not pass any courses in the first semester.[14] Among these 1,802 participants, 208 participants secured accommodation by September 2022, while others obtained housing through AF later or not at all.

Full demographic data and information on the field of study are available for 690 participants, a subset used to analyze the effect of adding control variables to the specification. Table 3 shows that the average age of students in this sample is 20 years old, with 46% being female and only 5% being non-Swedish. This is expected, as most students without registered data are foreign students who have not lived in Sweden.

[13]As shown in column 1 of Table A2, the lottery rank does not correlate with the probability of appearing in the selected sample.

[14]As shown in Table 9, only 6% of participants failed to pass any courses in their first academic year, and this outcome is not predicted by lottery rank.

Out of the 874 individual survey respondents, 655 could be linked to a grade in the first semester and were included to explore potential mechanisms. Demographic data were available for 253 students in this sample. Columns (3) and (4) in Table 3 show the mean and standard deviation for various variables across survey respondents and non-respondents for comparison. The averages are mostly similar between the two groups, with both consisting primarily of undergraduate students, an average age of 20, about 5% being immigrants, and similar levels of parental education. The mother's income variable is slightly higher for non-respondents, at approximately 620,500 Swedish krona annually ($\approx$ 58,000 US dollars). Overall, both respondents and non-respondents appear similar in terms of their characteristics.

4 Empirical strategy

The primary objective of this study is to examine the potential effects of residing in student housing by the start of the semester on educational outcomes. I estimate the effects using the following model:

$$y_i = \alpha + \delta AC_i + \beta X^i + \gamma_f + \epsilon_i \tag{1}$$

where y_i represents the different educational outcomes of lottery participant i. AC_i is an indicator variable equal to 1 if lottery participant i has secured a student housing contract that started before September 2022. This timing is notable because the first semester officially starts in late August. Having stable accommodation in place before the start of lectures is important for students as it ensures they have a suitable living environment, reducing potential stress and disruptions during a critical period of adjustment to academic life. Securing housing early allows students to

focus fully on their studies from the beginning, rather than dealing with the uncertainty and logistical challenges of finding accommodation during the semester. Later in this paper, I also explore whether receiving accommodation in subsequent months has any impact. Moreover, I control for a series of characteristics, which are contained in the vector X, comprising students' age, gender, an indicator for being Swedish, lagged income and employment status, an indicator for enrollment in a graduate program, parents' highest level of education achieved, parents' income, and indicators for parents living in Skåne, the state where the university is located. γ_f represents the field of study fixed effects.

δ is the key parameter of interest, capturing differences in educational outcomes between lottery participants who reside in student accommodations at the beginning of their studies and those who do not. To address potential endogeneity issues that threaten the causal interpretation of δ, I use an instrumental variable (2SLS) framework, leveraging the student housing lottery that randomly assigns priority in a housing queue to the lottery participants. Before the academic year 2022/2023 began, more than 200 units of student accommodation became available to the lottery participants, as shown in Table 2. This indicates that around 200 participants would have been able to receive student housing before the academic year began. Since a good lottery rank increases the participant's likelihood of securing accommodation earlier than other participants, I constructed an indicator variable that equals 1 if the participant's lottery rank is among the top 200 priorities. This binary variable is the instrumental variable that affects the educational outcomes of the participants by influencing the likelihood of having student accommodation by the beginning of the Fall semester.

Randomization: A key identifying assumption for this analysis is that the housing lottery creates exogenous variation in access to student residential units. If the lottery rank was endogenous, one might expect it to be predicted by pre-determined characteristics of the participants. Table 4 shows that this is not the case for either the entire sample with available characteristics data, nor for the sample of survey respondents and non-respondents separately. Of the 21 regressions of different characteristics on the lottery rank, only one is significant at a 1% level. Specifically, the indicator for being a graduate student seems to be negatively correlated with the lottery rank in the sample of survey respondents. Upon investigating this further, I find it is due to limited variation in this variable, with more than 96% of the respondents with available controls being undergraduates. Furthermore, a series of joint F-tests confirm that the set of predetermined characteristics does not predict the lottery rank.[15]

Relevance: To investigate the strength of the instrumental variable in predicting the probability of having accommodation at the beginning of the university studies, I estimate the first-stage results. Table 5 shows that in all samples, the indicator for having a lottery rank below 200 is strongly correlated with having accommodation by September. Specifically, a lottery rank below 200 increases the probability of obtaining accommodation by 66 percentage points for the main sample. The fact that the coefficients are not equal to one can be due to several reasons: First, not all of the participants with a rank lower than 200 apply for student housing from AF after the lottery. Even though they retain their lottery rank and remain eligible for AF-provided student housing, some students choose not to apply for available units via AF's website. This is likely because they have already secured alternative accommodation. Second, some participants with

[15]The joint F-stat and p-value for panel B are calculated while excluding the indicator for being a graduate student due to its lack of variation

a lottery rank above 200 might apply for a unit that no higher-ranked participant has applied for. In such cases, the participant with a rank above 200 could still receive accommodation. The F-statistics are high in all columns which indicates a close correspondence between the instrument and the variable of interest, confirming instrumental relevance.

Monotonicity: The monotonicity assumption implies that having a better lottery rank should move the probability of obtaining student accommodation for all participants in the same direction. In this case, having a better rank should increase the probability of having accommodation by September for all students, regardless of their rank. However, one might argue that participants with better ranks could become aware of their higher priority and decide to wait for their preferred type of accommodation to become available. If this were the case, the monotonicity assumption would be violated, some participants with high lottery ranks might have a lower probability of securing housing before September. Despite this concern, such a violation is unlikely due to the nature of the lottery system and the format of the ranks—a random date and time stamp. This structure makes it difficult for participants to realize how good or bad their rank is. Lottery participants are not informed of the start and end range of the timestamp distribution, and they also lack information about other participants' timestamps. For example, a participant might receive a timestamp like "2022-07-12 11:21:00" but they have no way of knowing what the earliest possible timestamp was, leaving them uncertain of their relative position in the lottery. This lack of information reduces the likelihood that participants with higher ranks intentionally delay their housing application.

Moreover, the goodness of a rank depends on the number of units supplied by AF. If AF supplies a large number of units, then most ranks can be considered "good" and vice versa. As shown in Figure A2, the number

of available housing units has fluctuated across different years. The information about upcoming housing availability is not disclosed to the participants, and waiting would thus be a risky strategy. Therefore, this potential violation is unlikely. To further verify the monotonicity assumption, I plot a locally weighted regression of the indicator for having accommodation by September against the lottery rank.[16] Figure 4 depicts the local linear regression results of the relationship between lottery ranks and the probability of securing student housing. The Lowess (locally weighted scatter plot smoothing) curve provides a smoothed curve that highlights the relationship between lottery ranks and the likelihood of having accommodation by September, offering a clearer visualization of trends in the data. This figure demonstrates that as the rank increases, the probability of residing in student accommodation at the beginning of the studies decreases monotonically, as expected.

Exclusion restriction: For the current IV approach to be valid, the instrument must not affect educational outcomes through any means other than its impact on accommodation status. As mentioned earlier, the lottery rank itself is meaningless to participants beyond its role in determining student housing allocation. It is highly unlikely that the lottery rank is correlated with unobserved factors that influence students' academic achievement.

[16]The lottery rank ranges from 1 to 2,546, with priority decreasing as the rank increases.

5 Main results

5.1 Educational outcomes

I begin the empirical analysis by examining the effects of lottery rank (reduced form) and residing in student housing (IV), using the sample of lottery participants who have at least one registered grade (excluding courses without granular grades) in the first semester of their studies. Table 6 presents the estimated effects of having student accommodation at the start of university (by September) on educational outcomes. The first row shows the OLS estimates of how having a lottery rank below 200 affects average grades and the share of times the participant ranked in the top 5% and top 10% of the courses' grade distribution, weighted by the number of credits for each course. These results represent the reduced-form effects. The second row presents the 2SLS estimates of the effect of having accommodation by September on educational outcomes. In this specification, the lottery rank dummy variable is used as an instrument for having accommodation by September.

Column 1, 3, and 5 in Table 6 present the reduced-form estimates, which are significant for all educational outcomes. Overall, having a lottery rank below 200 increases average grades by 19% of a standard deviation. Examining the results for the percentage of times participants ranked highly among their peers, the increases are 6.8 and 10.2 percentage points (corresponding to 21.93% and 28.44%, respectively) for ranking in the top 5% and top 10%, respectively. These results establish a strong link between the lottery rank and the educational outcomes.

Column 2, 4, and 6 show the effect of residing in student accommodation at the start of the studies on the academic achievement of lottery participants, using lottery rank as an instrument for the explanatory variable.

The results indicate a significant increase of 29% of a standard deviation in average grades, which is significant at 1%. This is a substantial effect, on the higher end of the range of results (in terms of magnitude) reported in studies examining the causal effects of various interventions on student grades (Sacerdote, 2001; Dynarski, 2003; Angrist et al., 2009; Bettinger and Long, 2010). The effects on the probability of being in the top 5% and top 10% are also substantial: an increase of approximately 33% and 43%, respectively.

These initial results include all lottery participants with registered grades in the first semester, regardless of the availability of their demographic and parental characteristics. Now, I narrow the analysis to focus only on participants for whom such data are available. This serves two purposes. First, it mainly focuses on Swedish students, who may have an advantage in securing housing independently due to their familiarity with the housing market and their ability to use their personal networks. Second, it allows me to assess whether including control variables affects the results. If randomization is valid, including control variables should not meaningfully change the results.

Panel A in Table 7 shows the results of similar regressions as in Table 6, but applied to this restricted sample. This table also includes the results with participants' control variables and field of study fixed effects. In this restricted sample, the coefficients are large and comparable in magnitude to those in Table 6, but none are statistically significant. Also, the inclusion of the control variables does not change the coefficients much. The restricted sample mainly consists of Swedish students who have been living in Sweden and therefore have their data recorded in Statistics Sweden. Panel B further restricts the sample to only Swedish students to clarify the effects within this group. Similar to Panel A, none of the coefficients

are statistically significant, even without control variables. However, the magnitudes of the coefficients in both panels are comparable to those in Table 6. The obtained results may be due to a power issue, given the smaller number of observations. These findings may also suggest that the initial analysis in Table 6 might mask some heterogeneity in how student housing affects educational outcomes. While student housing increases the stability of living situations and facilitates integration, Swedish students are not as dependent on these benefits as other student groups. They are already familiar with the local culture, language, and educational system and have established social networks that help with stabilizing their living arrangements and integrating into university life without relying on student housing. Given these potential differences, I will next focus on analyzing the effects on non-Swedish students who have just moved to Sweden for their studies.

Table 8 presents reduced form and 2SLS regression results for the sample of "newcomers"—new incoming students who were not residents of Sweden in the two years prior to the start of the academic year. This sample consists of non-Swedish students, including exchange students, who are temporarily studying at the university but are officially enrolled in another institution as part of an international exchange program, and non-exchange students, who are fully enrolled in degree programs at the university. Panel A examines the effect of student housing on the entire newcomer sample. Column 2 shows that residing in student accommodation at the start of the academic year increases the average standardized grades by 0.326. It also increases the probability of ranking in the top 5% and top 10% of the grade distribution by 11.4 and 17.2 percentage points, respectively. These coefficients are larger in magnitude compared to the results from the full sample of participants.

Panel B and panel C divide the sample into exchange and non-exchange students, respectively. The analysis reveals larger coefficients for non-exchange students compared to exchange students, with significant positive effects on their educational outcomes. If the results are not influenced by the smaller sample size in panel B, several factors could explain the findings: non-exchange students may be more committed to achieving high grades, and stable accommodation can significantly help them focus on their studies and manage their time more effectively, ultimately leading to improved academic performance. Additionally, because non-exchange students tend to stay longer, they are more likely to integrate deeply into the university's social life, which can positively impact their academic success. In contrast, exchange students might prioritize personal and cultural experiences, focusing more on developing soft skills, likely due to the shorter duration of their stay, which has also been linked to lower academic achievements compared to longer stays (Granja and Visentin, 2024). Moreover, student housing offers increased opportunities for social integration, which has been shown to enhance educational achievement (Astin et al., 1997). However, exchange students, given their limited time, may not prioritize building long-term connections and might engage less in the university's social activities. These explanations are somewhat speculative, and more research is needed to fully understand the impact of exchange versus full-time studies on academic performance.

Next, I examine the effect of having student accommodation on the probability of dropping out of university and the probability of passing at least one exam in the first year, using the complete sample of lottery participants. Both coefficients are small and not statistically significant, as shown in Table 9. This is important because it indicates that the results obtained previously are not influenced by selective attrition or compositional changes

due to having or not having student housing. Furthermore, Figure A3 shows no significant difference in the number of credits registered between students with a lottery rank below 200 and those above, simplifying the interpretation of the main results. This demonstrates that students with better academic achievement are not taking fewer credits.

5.2 Medium-term outcomes

The results so far focus on participants' educational outcomes in the first semester of their studies. To determine whether these effects persist into the second semester and through the end of the first academic year, I re-estimate Equation 1 using a sample of students who received at least one detailed grade, either on a percentage or A-E scale, in both the first and second semesters.[17] If access to student housing positively impacted their education in the first semester, these effects might either spill over into the second semester or be substantial enough to influence cumulative educational achievement for the entire first academic year.

The relative significance and magnitude of the results for the first two semesters, both separately and cumulatively, are presented in Figure 5. At first glance, it is evident that the effects are smaller and less precise for the second semester. However, the results for the top 5% and top 10% variables remain significant. Table 10 contains the coefficients obtained. Being in student housing positively affects the probability of ranking in the top 5% and top 10% of the grade distribution in both semesters. In the first semester, the probability increases by 47% and 52%, respectively, while in the second semester, the increases are 37% and 38%. However, the effect on average standardized grades is no longer significant during

[17] As shown in Table A2, having a detailed grade in both semesters is not predicted by the lottery rank.

the second semester. The last column shows the results for the entire first year, indicating that the positive effects on standardized grades in the first semester contribute to higher overall grades for the entire academic year. The results for the other variables also remain positive and significant, consistent with the findings for the first two semesters analyzed separately.

There are two main takeaways from these medium-term results. First, the benefits of student housing become less noticeable as the academic year goes on, because students with worse ranks eventually find accommodation, either through AF housing or other means. However, the persistent positive impact on cumulative grades suggests that access to student housing may have long-term benefits throughout university education and is not just a temporary short-lived boost.

5.3 The size of the effects

To benchmark my results, I compare them with findings from other studies that examine the impacts of various interventions on educational outcomes. Marie and Zölitz (2017) find that university students' grades increase by approximately 10% of a standard deviation after being banned from entering cannabis shops. In an experiment run by Carrell and Kurlaender (2023), they show that receiving personalized feedback from the professor increases the students' grades by 9% of a standard deviation. These effects are about one-third of the impact of having student accommodation, as shown in Table 6 of this study. Another study reports even smaller effects: 6% of a standard deviation increase in the test scores when the student receives an additional £1,000 in student financial aid (Murphy and Wyness, 2023). My results are more comparable in magnitude to those of Angrist et al. (2009) who find that receiving financial aid up to $5,000 increases university students' GPA by 17.7% of a standard deviation.

Most of the other studies to which I relate my paper focus on school students, not university students, largely because access to data on university grades is rare. Nonetheless, for the sake of comparison, it is beneficial to benchmark these results against those studies. For example, the improvement in grades observed here is nearly twice as large as the benefit of starting school one hour later, which allows high school students to be more well-rested (Carrell et al., 2011). The effect of student accommodation in the main specification is also three times larger than the impact of a standard deviation increase in teacher quality (Kane et al., 2008) and the prohibition of legal access to alcohol (Carrell et al., 2011).

Focusing specifically on studies that use Swedish data, which also mostly involve school students, it has been shown that an extra 10 days of school instruction raises the grades by 1% of a standard deviation (Carlsson et al., 2015) and a class size reduction of seven students improves the cognitive abilities of the students by 0.23 of a standard deviation (Fredriksson et al., 2013). Additionally, Sund (2009) finds that one standard deviation increase in peer GPA leads to a 0.08 standard deviation increase in high school grades and Cattan et al. (2023) demonstrate that increasing total absences by ten days reduces the student's GPA by 4.4% of a standard deviation. Therefore, the results obtained in the current study can be considered significant when compared to existing literature that studies the effects on grades. However, note that it cannot be ruled out that the main effects can be much smaller in terms of magnitude considering their standard errors. Taking into account the confidence intervals, the main effects can be as small as 6% of a standard deviation, which aligns with findings in the broader literature.

The large observed effects may also reflect that the lack of accommodation leads some students to take up part-time work, have long commutes, or

share housing in ways that affect their academic performance. I further examine these mechanisms in Section 7.

5.4 Timing of the treatment

So far, I have used the time between the lottery and the start of the academic year in late August as the treatment period. To test the robustness of my results, the next step is to assess how the effects vary if the waiting period is extended. By adjusting the timing, I can determine whether the observed effects remain consistent across different time frames and whether the positive impact of having student accommodation is specific to the period ending in August. Changing the treatment period provides students with different lengths of time to secure housing, which may affect their educational outcomes in various ways. If securing accommodation during other time periods leads to different impacts, this could have significant policy implications.

Figure 6 illustrates the results of shifting the treatment month from the beginning of September to other months. Each treatment listed can occur in the specified month or earlier. For instance, the binary variable "accommodation by October" is equal to 1 if the participant received student accommodation by the beginning of October or earlier, and 0 if they received it later or not at all.[18] The results are presented in Table 11. As shown in column 7, different instrumental variables are used for each month, and the new lottery rank thresholds are determined based on the number of student housing units provided by AF in each month (see Table 2). The small and imprecise results suggest that obtaining student accommodation after the academic year begins does not yield the same positive benefits as

[18]Note that some students may receive housing in subsequent years; however, this study only observes their first-year housing status.

securing housing before the semester starts. When the treatment is set to later periods, the positive effects of early housing diminish over time. This occurs because these treatment groups include students who have already experienced the initial disruptions of not having stable accommodation at the start of the semester, such as missing key academic and social integration opportunities and dealing with the stress and uncertainty of finding housing. These disruptions might dilute the previously observed benefits. This suggests that timing plays a critical role in the effectiveness of housing on academic outcomes.

6 Heterogeneity

Heterogeneous effects may arise based on the characteristics of the students. Some students may benefit more from access to student housing rather than relying on the private rental market. Landlords in the private market often "cherry-pick" tenants, aiming to minimize potential management issues and ensure a stable rent income. Male and minority students, in particular, face greater challenges in securing rentals in the private market compared to female and non-minority students. Research shows that landlords are more likely to discriminate against male and ethnic renters when selecting tenants (Öblom and Antfolk, 2017; Flage, 2018).

Moreover, younger adults are more often subject to discrimination in the private rental market. Studies suggest that landlords often fail to fulfill their contractual obligations when renting to younger tenants, resulting in unsatisfactory living conditions (Lister, 2006; Mackie, 2016; Maalsen et al., 2021). This combination of biases and barriers makes student housing a crucial option for these vulnerable groups. While data on race is unavailable, I start by investigating gender differences in student housing benefits

by dividing the sample into two groups: men and women. Table 12 reports the results of this heterogeneity analysis. It appears that women's grades are significantly impacted by residing in student housing, whereas for men, it is mostly the students who are at the margin of being at the top of the class distribution who are affected. This suggests that while women may benefit academically from the structured environment provided by student housing, male students, particularly those at the top of the academic performance distribution, may experience advantages that influence their relative standing in the class. However, the reasons leading to the difference in the outcome of the genders remain speculative, and more research is needed to understand the underlying factors driving these differences.

To investigate potential differences in effects across age groups, the students are divided into four categories: under 20, 20-21, 22-23, and over 23 years old. The coefficients are plotted in Figure 7, using the main 2SLS approach with lottery rank below 200 as the instrument. Detailed results are presented in Table A7. The results indicate that participants under 20 are significantly affected by receiving student housing, with an increase of nearly 50% of a standard deviation in their average standardized grades. For the group above 23, the effects are as large, but they are likely insignificant due to the smaller sample size. The effects for other age groups are smaller in magnitude and imprecisely estimated. If the absence of significant effects in other age groups is not due to a lack of statistical power, several factors could explain why younger students, particularly those under 20, are more strongly impacted. As mentioned earlier, there is some evidence of discrimination in the private housing market and among private landlords against younger adults. As such, it can be harder for them to find suitable housing on the private market. This could explain why they benefit more from receiving student accommodation. Another pos-

sible explanation is that younger students may be more dependent on a stable living environment during the critical period of starting higher education. Older students may have more experience and access to resources, which could make the timing of receiving accommodation less important for them.[19]

7 Mechanisms

In section 5, I identified a positive effect of having accommodation at the beginning of studies on the outcomes of lottery participants, particularly for students who have recently moved from another country to start their academic education. In this section, I explore additional outcomes that may be influenced by having student accommodation and their implications for education. These outcomes are derived from survey responses, which nearly 26% of participants with a detailed grade in the first semester completed.[20] Reflecting on the results from Survey I, participants identified rent and distance to faculty as the most important factors for housing. Those without student housing, who may need to work to afford their rent, or who live far from campus, might experience dissatisfaction according to their stated preferences. This could eventually affect their educational outcomes.

[19]Balancing tests for the gender and age heterogeneity samples are reported in Table A8.

[20]The relationship between having a good lottery rank and the likelihood of responding to the survey is presented in Table A2. Having a lottery rank smaller than 200 increases the probability of participating in the survey by 8.4 percentage points, a result that is statistically significant at the 5% level. Since students are not aware of the goodness of their lottery rank, this relationship may arise from other factors. For instance, students with lower lottery ranks might receive accommodation earlier, indirectly leading to more stability and time to respond to surveys. Additionally, these students may benefit from earlier integration into the academic environment, which could increase their likelihood of engaging with university communications, including survey participation. For such reasons, the results on student accommodation and survey outcomes should be interpreted with some caution.

One specific mechanism I examine is the employment of lottery participants. Although much of the literature has found negative effects of student employment on education, some studies suggest potential long-term benefits (Darolia, 2014; Neyt et al., 2019; Thies, 2023). The mixed results in the literature may be due to drawbacks such as reduced study time and lack of job relevance to the study field, as well as varying effects based on demographics and hours worked. Additionally, I investigate the location of students' residences, their living arrangements, and the frequency of their social interactions with friends. Proximity to campus can influence class attendance and, consequently, academic performance. Having a roommate, especially a fellow student, can also impact educational outcomes depending on the roommate's academic abilities (Sacerdote, 2001; Zimmerman, 2003).

I re-estimate Equation 1 incorporating these new outcomes—employment, location, having a roommate, and the number of social interactions—into my analysis. I also estimate the effects on educational outcomes for this sample to show how the results compare to those from the main sample. The results of this specification are presented in Table 13, which illustrates the effects of accommodation on the discussed outcomes across different samples of lottery participants.[21] Columns (1) and (2) show the effect on full-time and part-time employment, respectively. Overall, having a full-time job is rare among the participants with only 2% of them reporting that they are employed. The effects on full-time employment are negative and significant in most samples, ranging from 2.5 to 3 percentage points in magnitude. The coefficients for part-time employment are insignificant across all panels. As previously mentioned, renting accommodation in the private market can put greater financial pressure on students, as these rentals are

[21]Balancing tests for these samples are reported in Table A5.

generally more expensive than those provided by AF. As a result, students may need to seek employment alongside their studies to cover the higher rent costs. This can perhaps explain the negative effect of having student accommodation by September on the probability of being employed full-time.

Across all samples, being in student housing increases the likelihood of living in the city where the campus is located. This is expected since all student housing units are situated in the city of Lund. The effects are significant, with student accommodation increasing the probability of living in Lund by 13% to 17%, depending on the sample. Due to potential lack of housing in the city, students might resort to living in the neighboring cities. Moreover, the probability of having a roommate is negatively affected. Being in student housing decreases the probability of having a roommate by 31 percentage points for the sample of all respondents, equivalent to almost a 45% reduction. Since rental options on the private market are typically more expensive, students who rent privately often share apartments with roommates to help reduce the cost of rent. Student housing typically offers more affordable single-occupancy units, allowing students to avoid the need for roommates. This may provide greater personal space and stability, potentially contributing to improved educational outcomes. Columns (6) and (7) ensure that the main effects on educational outcomes are still present in the sample of survey respondents. Given the lower mean of average standardized grades among the newcomers, the effect on their grades is more pronounced. This may be due to a relatively greater increase in their probability of living in the city and closer to the university. Overall, the effects on educational outcomes for the survey sample are consistent with the effects found in Section 5. While the point estimates are larger, they are not statistically different from the main results. However, if the

true effects are indeed larger, it is possible that participation in Survey II was selective and the respondents benefited more from student housing. Since selection on unobservables cannot be directly tested, this remains a potential concern.

The results still hold after adjusting the p-values using the Benjamini-Hochberg multiple hypothesis testing method. The adjusted and raw p-values for the regressions in Panel A of Table 13 are presented in Table A6.

7.1 Housing stability index

Living situation stability was earlier discussed as a potential mechanism through which student accommodation can affect education. To establish this link, I employed the same 2SLS analysis using a housing stability index as the outcome. This index was constructed using three factors:

Duration of stay: This factor measures how long students can stay in their current housing. Students in AF apartments can remain in their units until the end of their studies, provided it does not exceed six years. In contrast, private market rentals may have shorter lease periods, sometimes as brief as three months. Such short-term leases can increase housing instability, forcing students to move during their studies and potentially harming their educational outcomes due to the stress of finding new accommodation and moving. For this variable, each survey respondent is assigned a score between 1 (less than a month) and 4 (entire study period), with 4 indicating the highest stability.

Type of rental contract: This factor assesses the type of rental contract students have. All AF units are first-hand contracts, meaning leases are directly between tenants and AF, providing legal protections such as

regulated rents. Many private market rentals may involve second-hand contracts or no legal contracts at all, both of which offer less stability compared to a first-hand contract.[22] This variable is scored between 1 (no legal contract) and 5 (owning an apartment), with 5 representing the most stable option.

Notice period: This factor considers how much notice tenants must give before moving out. A shorter notice period offers more flexibility if better accommodation becomes available. AF units have a notice period of one or two months, depending on the accommodation type. In contrast, some private market tenants face notice periods of three months or longer, according to survey responses. This variable is scored between 1 (more than three months) and 3 (one month), with 3 indicating the highest stability.

To analyze the dynamics between these variables and construct an index, I use Principal Component Analysis (PCA). The resulting housing stability index is a sum of all stability variables for each respondent, ranging from 5 to 12. Table 14 presents the effects of receiving student housing early on the housing stability index. As expected, the index increases by 0.634 points (7%) for students in student housing compared to those in private market accommodation. Greater housing stability, in turn, may contribute to improved educational outcomes for these students.

8 Conclusion

Access to proper accommodation and its timing can affect students' academic achievement. To causally identify the effects of early access to student housing on education, this paper leverages a student housing lottery

[22]Second-hand contracts, also known as sublet agreements, are rental agreements where the original tenant (primary tenant) rents out part or all of the rented premises to another person (subtenant).

that randomly ranks university students and assigns them different priorities for receiving housing.

I establish that access to affordable student housing at the beginning of the academic year has a significant positive impact on educational outcomes. Students who obtain student accommodation by September get higher standardized grades and are more likely to be among the top 5% and top 10% grades of their class in the first semester. These effects are particularly pronounced among the newly admitted international students, with access to student accommodation increasing their average standardized grades by 32% of a standard deviation. I supplement these findings by showing that these positive impacts persist into the second semester and contribute to improved cumulative first-year academic performance. Furthermore, different identification and robustness checks confirm the causal interpretation of these findings. The results underline the importance of residential affordability and stability at the start of academic studies.

This paper also explores potential mechanisms behind these effects. Unique survey data suggests that factors such as housing stability, student employment, residence location, and residential peers may partially explain the observed improvements in academic outcomes. The results add to the growing evidence on the channels through which higher education outcomes, particularly the grades, are determined.

Overall, this paper provides relevant implications for policymakers, providing evidence that lack of access to student housing and subsequent housing instability can act as a barrier to educational achievement. These findings suggest a number of interesting areas for future research, such as quantifying the impact of each mechanism and exploring strategies to mitigate the negative effects of lack of housing for various groups of students.

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Tables

Table 1: Admission and lottery statistics

	(1) N	(2) % of lottery participants	(3) Mean	(4) SD
Admitted incoming students	7,443			
Lottery participants	2,546			
With granular grades in the 1st semester	1,802	70.78		
With demographics data available	1,246	48.94		
Unique survey respondents	861	33.82		
With accommodation by September	208	8.17		
Days to get accommodation			82.71	86.95

Notes: The table above shows the number of students admitted to the university and the percentage of those who participated in the lottery. Lottery participants are then categorized into different samples based on specific criteria. See section 3 for details. Percentages in column (2) represent the share of admitted students in each category. Column (3) and (4) include the means and standard deviations, respectively.

Table 2: Available units and move-in times

	(1) # of participants receiving units	(2) # of available units for rent
August	208	213
September	470	500
October	100	109
November	44	44

Notes: The table above shows the number of units released by AF each month for lottery participants, along with the number of students whose contracts began in each respective month during 2022.

Table 3: Descriptive statistics

Sample:	(1) All		(2) Restricted		(3) Survey respondents		(4) Non- respondents	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
				Individual characteristics				
Age	21.21	3.31	20.63	1.88	20.51	1.50	20.70	2.06
Female	0.52	0.50	0.46	0.50	0.50	0.50	0.43	0.50
Immigrant			0.05	0.22	0.06	0.23	0.05	0.21
Employment status 1 year before			0.62	0.49	0.57	0.50	0.64	0.48
Skåne resident 1 year before			0.00	0.04	0.00	0.06	0.00	0.00
Study Grant 1 year before			0.79	0.41	0.75	0.43	0.80	0.40
Annual income 1 year before			975.10	940.41	1039.07	1079.67	938.07	848.57
Lottery rank (=1 if $\leq$ 200)	0.08	0.27	0.09	0.28	0.11	0.31	0.08	0.26
				Parents' characteristics				
Mother's education			4.64	0.85	4.64	0.83	4.64	0.87
Father's education			4.58	1.01	4.62	1.06	4.56	0.98
Father's income			7750.53	9144.29	7202.91	6509.22	8067.57	10362.22
Mother's income			5941.68	3983.51	5486.96	2965.70	6204.93	4450.10
Mother living in Skåne			0.01	0.08	0.00	0.06	0.01	0.10
Father living in Skåne			0.01	0.11	0.02	0.14	0.01	0.08
				Educational characteristics				
Graduate student			0.06	0.23	0.04	0.19	0.07	0.25
# of credits registered for (first semester)			18.49	9.18	18.45	9.49	18.50	9.00
Average standardized grades	0.05	0.84	0.08	0.81	0.13	0.83	0.05	0.81
Top 5	0.31	0.37	0.27	0.35	0.27	0.36	0.27	0.35
Top 10	0.36	0.39	0.34	0.39	0.34	0.40	0.33	0.38
# of observations	1,802		690		253		437	

Notes: The table presents the means and standard deviations of characteristics for lottery participants, divided into three samples. The restricted sample includes all lottery participants with available demographic data. This sample is further divided into survey respondents and non-respondents. Annual earnings are measured in 100 Swedish SEK (SEK 100 is equivalent to approximately 8.5 EUR as of July 2024). Variables average standardized grades, top 5 and top 10 are calculated as explained in section 3.2.

Table 4: Random assignment test

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Age	Female	Non-Swedish	Graduate	Study grant, $t-1$	Employment, $t-1$	Annual income, $t-1$
Dependent variable							
				Panel A: Restricted sample			
Lottery rank (=1 if $\leq$ 200)	-0.0053	-0.0208	0.0288	-0.0363	0.0419	-0.0120	-0.0000
	(0.0056)	(0.0214)	(0.0550)	(0.0380)	(0.0225)	(0.0224)	(0.0000)
Mean	20.630	0.459	0.051	0.055	0.786	0.616	975.101
# of observations	690	690	690	690	690	690	690
Joint F-statistic				0.709			
Prob>F				0.665			
				Panel B: Survey respondents			
Lottery rank (=1 if $\leq$ 200)	-0.0121	-0.0246	0.1139	-0.1107***	0.0559	-0.0220	-0.0000
	(0.0095)	(0.0390)	(0.1118)	(0.0202)	(0.0392)	(0.0398)	(0.0000)
Mean	19.514	0.502	0.055	0.036	0.755	0.569	1039.071
# of observations	253	253	253	253	253	253	253
Joint F-statistic				0.872			
Prob>F				0.516			
				Panel C: Survey non-respondents			
Lottery rank (=1 if $\leq$ 200)	-0.0027	-0.0219	-0.0293	-0.0070	0.0361	-0.0022	-0.0000
	(0.0066)	(0.0251)	(0.0484)	(0.0490)	(0.0271)	(0.0265)	(0.0000)
Mean	19.698	0.435	0.048	0.066	0.803	0.643	938.066
# of observations	437	437	437	437	437	437	437
Joint F-statistic				0.614			
Prob>F				0.744			

Notes: The table shows separate OLS estimates for lottery rank indicator on pre-determined characteristics of the participants. Panel A uses the sample of all participants with control variables available, and the sample gets divided into two groups of survey respondents and non-respondents in panel B and panel C, respectively. The joint F-statistics and p-value of panel B is calculated excluding the indicator for being a graduate student (see Randomization part under Section 4). Robust standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01

Table 5: First-stage

	Accommodation by September			
	All	Restricted	Swedish	Newcomers
	(1)	(2)	(3)	(4)
Lottery rank (=1 if $\leq$ 200)	0.6630***	0.5548***	0.5447***	0.7646***
	(0.0383)	(0.0641)	(0.0666)	(0.0456)
Mean	0.089	0.077	0.073	0.099
# of observations	1,802	690	655	1,014
F-statistic	300.16	74.94	66.98	280.73

Notes: The table presents first-stage estimates of the relationship between the likelihood of having student accommodation by September and lottery rank across the different samples. The reported F-statistics are Montiel Olea-Pflueger's effective F-statistics for testing instrument strength. Robust standard errors are shown in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table 6: Effect of student housing receipt

	Average standardized grades		Top 5		Top 10	
	RF	IV	RF	IV	RF	IV
	(1)	(2)	(3)	(4)	(5)	(6)
Lottery rank (=1 if $\leq$ 200)	0.1900***		0.0683**		0.1024***	
	(0.0725)		(0.0334)		(0.0348)	
Accommodation by September		0.2866***		0.1030**		0.1544***
		(0.1101)		(0.0506)		(0.0528)
Mean	0.05	0.05	0.31	0.31	0.36	0.36
# of observations	1,802	1,802	1,802	1,802	1,802	1,802
Controls	No	No	No	No	No	No
Field of study FE	No	No	No	No	No	No

Notes: The table illustrates estimates of different student outcomes on a dummy variable for lottery rank below 200 (Reduced Form) and on a dummy variable for having accommodation by the beginning of September, while instrumenting the treatment with lottery rank (IV). The estimates are using the sample of all lottery participants for whom there has been a detailed grade registered before 2023-01-01. The outcomes are weighted by each course's number of credits (ETCS). For column 5, 6, 7, and 8, the outcomes are the share of courses where the student's grade ended up in top 5 and top 10 percentile of all the grades in that class, respectively. Robust standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01

Table 7: Effect of student housing receipt - Samples with controls available

	Average standardized grades			Top 5			Top 10		
	RF (1)	IV (2)	IV (3)	RF (4)	IV (5)	IV (6)	RF (7)	IV (8)	IV (9)
Panel A: Restricted sample									
Lottery rank (=1 if ≤ 200)	0.1466			0.0439			0.0747		
	(0.1242)			(0.0500)			(0.0529)		
Accommodation by September		0.2643	0.2556		0.0792	0.0837		0.1347	0.1017
		(0.2231)	(0.2176)		(0.0909)	(0.0891)		(0.0970)	(0.0912)
Mean	0.08	0.08	0.08	0.27	0.27	0.27	0.34	0.34	0.34
# of observations	690	690	690	690	690	690	690	690	690
Panel B: Swedish only sample									
Lottery rank (=1 if ≤ 200)	0.1601			0.0393			0.0762		
	(0.1215)			(0.0513)			(0.0544)		
Accommodation by September		0.2938	0.3127		0.0721	0.0819		0.1399	0.1051
		(0.2203)	(0.2093)		(0.0947)	(0.0910)		(0.1016)	(0.0939)
Mean	0.07	0.07	0.07	0.27	0.27	0.27	0.34	0.34	0.34
# of observations	655	655	655	655	655	655	655	655	655
Controls	No	No	Yes	No	No	Yes	No	No	Yes
Field of study FE	No	No	Yes	No	No	Yes	No	No	Yes

Notes: The table illustrates estimates of different student outcomes on a dummy variable for lottery tank below 200 (Reduced Form) and on a dummy variable for having accommodation by September, while instrumenting the treatment with lottery rank (IV). The estimates are using the restricted sample of all lottery participants for whom there has been a detailed grade registered before 2023-01-01, and all the control variables are available. The outcomes are weighted by each course's number of credits (ETCS). For columns 4-6 and columns 7-9, the outcomes are the share of courses where the student's grade ended up in top 5 and top 10 percentile of all the grades in that class, respectively. Panel A consists of all the students with available control variables, and Panel B consists of all the students with available control variables who are Swedish. Robust standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01

Table 8: Effect of student housing receipt - Newcomers

	Average standardized grades		Top 5		Top 10	
	RF	IV	RF	IV	RF	IV
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: All newcomers						
Lottery rank (=1 if ≤ 200)	0.2491***		0.0869*		0.1314***	
	(0.0910)		(0.0466)		(0.0487)	
Accommodation by September		0.3258***		0.1136*		0.1719***
		(0.1221)		(0.0612)		(0.0635)
Mean	0.03	0.03	0.34	0.34	0.37	0.37
# of observations	1,014	1,014	1,014	1,014	1,014	1,014
Panel B: Exchange students only						
Lottery rank (=1 if ≤ 200)	0.2085		0.0723		0.1109	
	(0.1700)		(0.0876)		(0.0893)	
Accommodation by September		0.2313		0.0802		0.1230
		(0.1912)		(0.0981)		(0.1005)
Mean	-0.01	-0.01	0.36	0.36	0.39	0.39
# of observations	385	385	385	385	385	385
Panel C: Non-exchange students only						
Lottery rank (=1 if ≤ 200)	0.2597**		0.0972*		0.1434**	
	(0.1079)		(0.0551)		(0.0582)	
Accommodation by September		0.3661**		0.1371*		0.2021**
		(0.1563)		(0.0776)		(0.0807)
Mean	0.06	0.06	0.33	0.33	0.37	0.37
# of observations	629	629	629	629	629	629
Controls	No	No	No	No	No	No
Field of study FE	No	No	No	No	No	No

Notes: The table illustrates estimates of different student outcomes on a dummy variable for lottery tank below 200 (Reduced Form) and on a dummy variable for having accommodation by September while instrumenting the treatment with lottery rank (IV). The outcomes are weighted by each course's number of credits (ETCS). The table has been divided into three panels: Panel A consists of the lottery participants who just moved to Sweden and for whom there has been a detailed grade registered before 2023-01-01. Panel B and Panel C divide panel A into two samples of exchange students and non-exchange students, respectively. The outcome for columns 3-4 is the courses the student passed as a share of all the courses the student registered for. For columns 5-6 and columns 7-8, the outcomes are the share of courses where the student's grade ended up in top 5 and top 10 percentile of all the grades in that class, respectively. Robust standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01

Table 9: Effects of student housing receipt on dropping out

	Dropout		Passed at least one exam	
	RF	IV	RF	IV
	(1)	(2)	(3)	(4)
Lottery rank (=1 if $\leq$ 200)	-0.0206		0.0128	
	(0.0139)		(0.0163)	
Accommodation by September		-0.0324		0.0201
		(0.0217)		(0.0255)
Mean	0.06	0.06	0.94	0.94
# of observations	2,546	2,546	2,546	2,546
Controls	No	No	No	No
Field of study FE	No	No	No	No

Notes: The table illustrates estimates of indicators for dropping out and passing at least one exam in the first year on a dummy variable for lottery tank below 200 (Reduced Form) and on a dummy variable for having accommodation by September while instrumenting the treatment with lottery rank (IV). The sample used is the sample of all the students who participated in the lottery. Robust standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01

Table 10: Medium-term effects of student housing receipt on education

Dependent Variable	1st Semester	2nd Semester	Cumulative
Average Standardized Grades	0.3482***	0.1793	0.2359**
	(0.1337)	(0.1133)	(0.0995)
Mean	0.04	0.06	0.05
Top 5	0.1470**	0.0914*	0.1115***
	(0.0600)	(0.0505)	(0.0426)
Mean	0.31	0.29	0.30
Top 10	0.1860***	0.1121**	0.1344***
	(0.0615)	(0.0541)	(0.0446)
Mean	0.36	0.33	0.35
# of observations	1,326	1,326	1,326

Notes: This table presents the results of the 2SLS regressions of educational outcomes on the indicator of having student accommodation by September, using lottery rank as IV. The results are presented separately for semester 1, semester 2, and the first year cumulatively. The sample of students with grades available in the first and second semesters is used. Dependent variables are listed in the rows. The treatment is having accommodation at the start of the academic year by the beginning of September. Robust standard errors are in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table 11: Effects of student housing receipt at different times on educational outcomes

	(1) Average standardized grades	(2) Top 5	(3) Top 10	(4) N	(5) N (Control)	(6) Weak IV test F-stat	(7) Instrument
Accommodation by September	0.2866***	0.1030**	0.1544***	1,802	1,641	300.16	Lottery rank (=1 if $\leq$ 200)
	(0.1101)	(0.0506)	(0.0528)				
Accommodation by October	-0.0274	0.0121	0.0108	1,802	1,279	1157.01	Lottery rank (=1 if $\leq$ 700)
	(0.0652)	(0.0284)	(0.0299)				
Accommodation by November	-0.0408	-0.0080	-0.0089	1,802	1,206	1085.93	Lottery rank (=1 if $\leq$ 800)
	(0.0656)	(0.0286)	(0.0302)				
Accommodation by December	-0.0605	-0.0260	-0.0298	1,802	1,171	1074.21	Lottery rank (=1 if $\leq$ 850)
	(0.0651)	(0.0285)	(0.0301)				

The table illustrates separate 2SLS estimates of different student outcomes on a dummy variable for having accommodation in a certain month, while instrumenting the treatment with different instruments as explained in section 5.4. The estimates are calculated using the sample of all lottery participants for whom there has been a detailed grade registered before 2023-01-01. The outcomes are weighted by each course's number of credits (ETCS). The reported F-statistics are Montiel Olea-Pflueger's effective F-statistics for testing instrument strength. Robust standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01

Table 12: Effects of student housing receipt on women vs. men

	Average standardized grades	Top 5	Top 10
Panel A: Women only			
Accommodation by September	0.3748***	0.0680	0.1245*
	(0.1334)	(0.0664)	(0.0693)
Mean	0.04	0.33	0.37
# of observations	941	941	941
Panel B: Men only			
Accommodation by September	0.1874	0.1441*	0.1888**
	(0.1778)	(0.0781)	(0.0810)
Mean	0.07	0.29	0.35
# of observations	861	861	861

Notes: The table illustrates 2SLS estimates of different student outcomes on a dummy variable for having accommodation by September while instrumenting the treatment with lottery rank (=1 if ≤ 200). Panel A includes the participants who are women and panel B includes the participants who are men. The estimates are calculated using the sample of lottery participants for whom there has been a detailed grade registered before 2023-01-01. Robust standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01

Table 13: Potential mechanisms

	(1) Full-time employment	(2) Part-time employment	(3) Living in Lund	(4) Having roommate	(5) Social activities (per week)	(6) Standardized grades	(7) Top 10
Panel A: All respondents							
Accommodation by September	-0.0266*	-0.0190	0.1465***	-0.3098***	0.5785	0.3508***	0.2060***
	(0.0138)	(0.0454)	(0.0225)	(0.0692)	(0.4502)	(0.1220)	(0.0528)
Mean	0.02	0.14	0.88	0.69	3.67	0.09	0.38
# of observations	1,234	1,234	1,234	1,234	1,234	1,234	1,234
# of observations (unique)	655	655	655	655	655	655	655
Panel B: Restricted sample respondents							
Accommodation by September	-0.0262**	-0.0806	0.1136***	-0.3927***	0.2763	0.3303*	0.1369
	(0.0123)	(0.0564)	(0.0238)	(0.1076)	(0.5582)	(0.2004)	(0.0852)
Mean	0.01	0.12	0.93	0.60	3.85	0.15	0.36
# of observations	450	450	450	450	450	450	450
# of observations (unique)	253	253	253	253	253	253	253
Panel C: Swedish respondents							
Accommodation by September	-0.0291**	-0.0655	0.1299***	-0.4618***	0.2890	0.4495**	0.1274
	(0.0142)	(0.0753)	(0.0295)	(0.1311)	(0.7089)	(0.1832)	(0.0975)
Mean	0.01	0.13	0.92	0.63	3.85	0.16	0.36
# of observations	421	421	421	421	421	421	421
# of observations (unique)	239	239	239	239	239	239	239
Panel D: Newcomer respondents							
Accommodation by September	-0.0230	0.0109	0.1486***	-0.2029**	0.7742	0.3817***	0.2803***
	(0.0228)	(0.0651)	(0.0345)	(0.0881)	(0.7093)	(0.1478)	(0.0665)
Mean	0.03	0.15	0.85	0.74	3.59	0.05	0.39
# of observations	746	746	746	746	746	746	746
# of observations (unique)	382	382	382	382	382	382	382
Survey FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table illustrates estimates of different student outcomes on an indicator for having accommodation by September while instrumenting the treatment with lottery rank (2SLS). The table has been divided into four panels: Panel A consists of all of the lottery participants who responded to the survey. Panel B is the sample of the respondents with complete demographic data available. Panel C includes only Swedish respondents with complete demographic data available. Panel D involves a sample of the respondents with no demographic data available. The students in all panels have at least one detailed grade registered before 2023-01-01. Survey fixed effects are included. Robust standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01

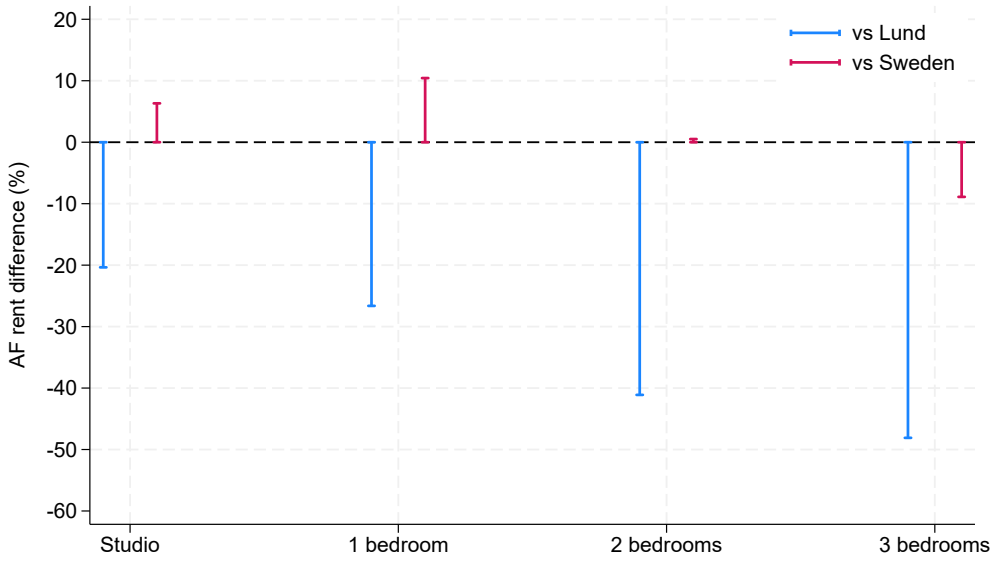
Table 14: Effects of student housing receipt on housing stability

	(1) Housing stability index	(2) Housing stability index
Accommodation by September	0.6342***	0.4876***
	(0.1057)	(0.1562)
Mean	8.97	8.97
# of observations	1,137	1,137
Survey FE	Yes	Yes
Field of study FE	No	Yes

Notes: The table illustrates estimates of the housing stability index on an indicator for having accommodation by September while instrumenting the treatment with lottery rank (2SLS). The index is created as explained in section 7.1. Robust standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01

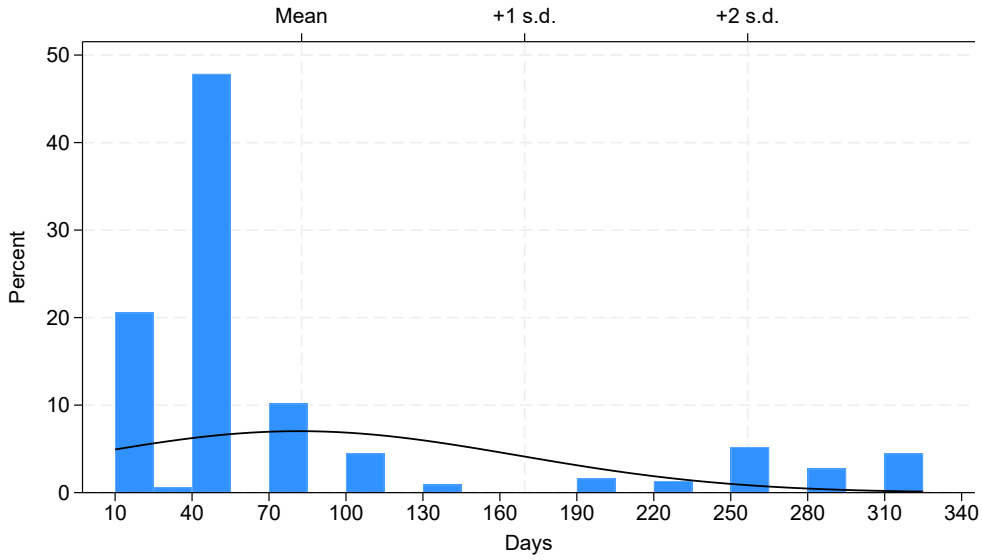
Figures

Figure 1: Rent comparison



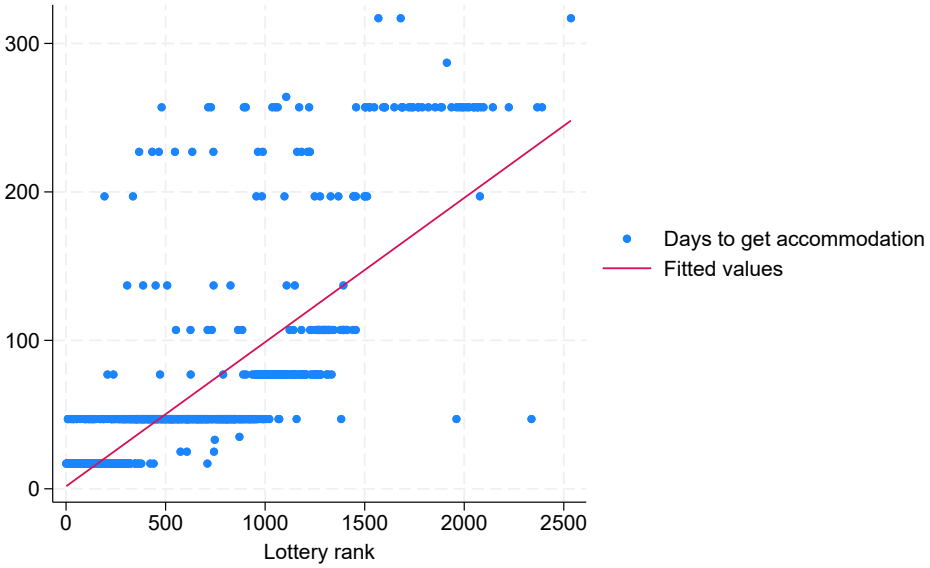
Notes: This figure shows the percentage difference in average monthly rent between AF's student housing and rental housing in Lund Municipality and across Sweden, by apartment type. The Swedish rent data is sourced from Statistics Sweden, while Lund rents are based on advertised listings from multiple rental platforms. All data belongs to the year 2023.

Figure 2: Number of days between lottery and move-in date histogram



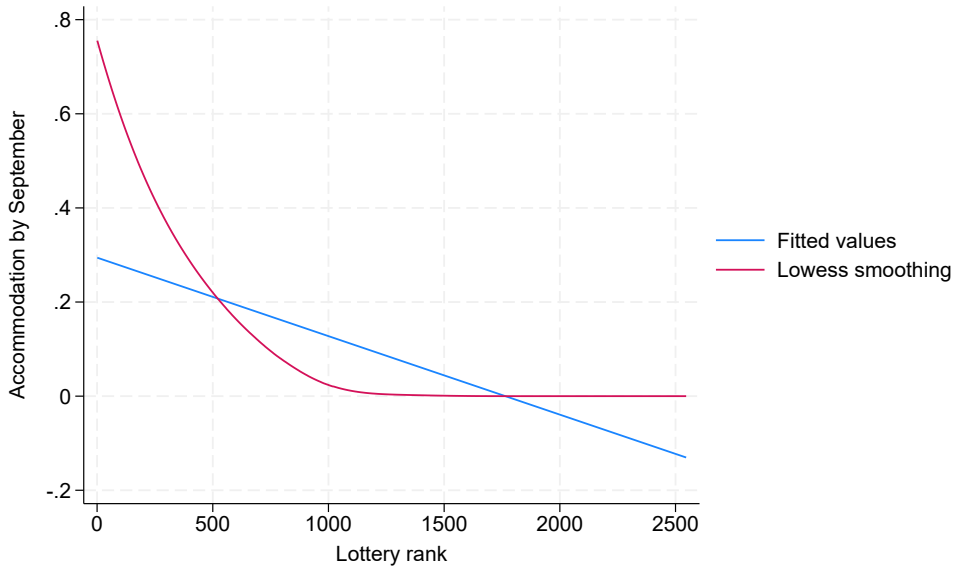
Notes: This figure shows the distribution of the number of days it took for lottery participants to secure student housing. The sample includes participants who obtained housing from AF by the end of May 2023.

Figure 3: Relationship between lottery rank and time to secure student housing



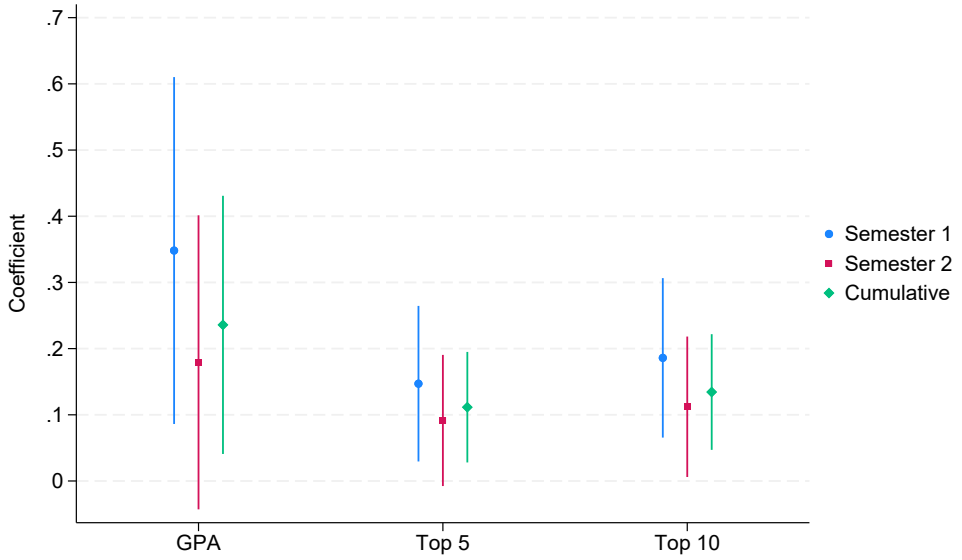
Notes: The figure above is a scatter plot depicting lottery ranks versus the number of days taken to secure accommodation for participants who obtained housing from AF by the end of May 2023. A fitted line is included to illustrate the relationship between lottery rank and the number of days it took to get student housing.

Figure 4: Local linear regression



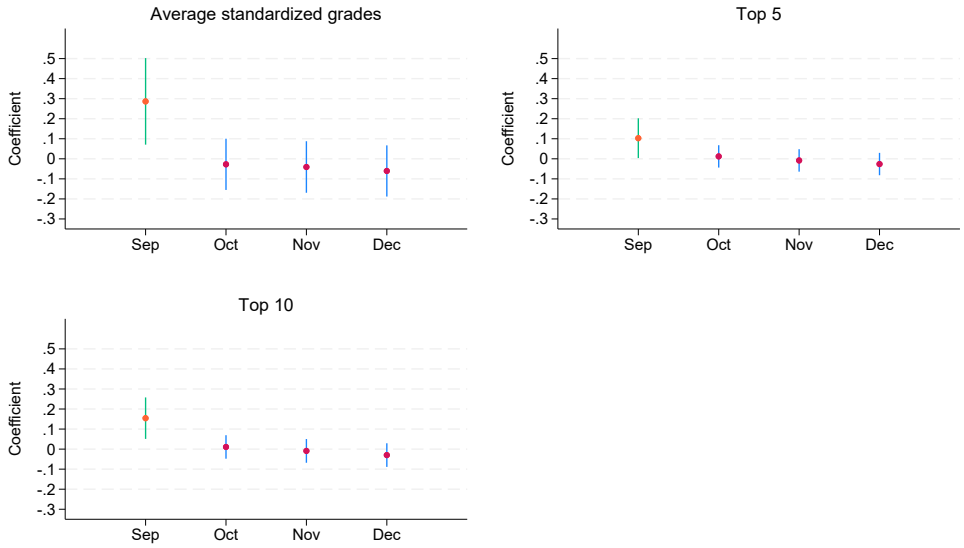
Notes: The figure above shows the Lowess (locally weighted scatter plot smoothing) regression of the likelihood of having student accommodation by September based on lottery ranks.

Figure 5: Medium-term effects on education



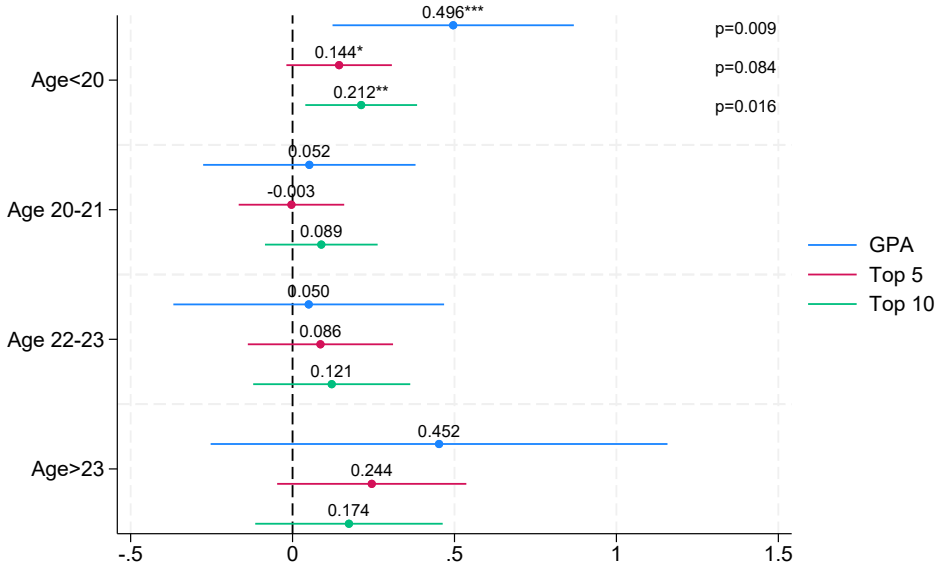
Notes: The figure above presents the coefficients and confidence intervals from the 2SLS regressions of various educational outcomes, both for individual semesters and cumulatively for the first academic year, on the indicator of being in student housing by September. The sample includes lottery participants with detailed grades recorded in both semester 1 and semester 2.

Figure 6: Effects of receiving student housing in different months



Notes: These figures present the coefficients and confidence intervals from regressions of various educational outcomes on having accommodation across different months. The estimates are calculated using the sample of lottery participants for whom there has been a detailed grade registered before 2023-01-01.

Figure 7: Effects of receiving student housing on different age groups



Notes: These figures present the coefficients and confidence intervals from regressions of various educational outcomes on having accommodation for different age groups. The estimates are calculated using the sample of lottery participants for whom there has been a detailed grade registered before 2023-01-01.

Appendices

A Tables

Table A1: Grade conversion

Grade	Percentage Range	Mean Percentage
A	85–100	92.5
B	75–84	79.5
C	65–74	69.5
D	55–64	59.5
E	50–54	52.0

Notes: The table above shows the grade conversion from the A-E grading scale to percentage ranges and the corresponding mean.

Table A2: Probability of appearing in different samples

	(1) 1st semester sample	(2) Medium-term sample	(3) Survey sample
Lottery rank (=1 if $\leq$ 200)	0.0281	0.0129	0.0847**
	(0.0327)	(0.0369)	(0.0363)
Mean	0.71	0.52	0.34
# of observations	2,546	2,546	2,546

The table presents separate regressions for three outcomes on lottery rank (=1 if $\leq$ 200): having at least one detailed grade recorded in the first semester (main sample), having a grade recorded in both the first and second semesters, and responding to the survey. The estimates are calculated using the sample of all lottery participants. Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01

Table A3: Descriptive statistics of Survey I respondents

	Survey I respondents	
	(1) Mean	(2) SD
	Individual characteristics	
Age	21.45	3.13
Female	0.59	0.49
	Accommodation preferences	
Preferred accommodation type:		
Corridor	0.26	0.44
Studio	0.48	0.50
Two bedroom	0.18	0.38
Three bedroom	0.08	0.28
Primary accommodation criterion:		
Distance	0.41	0.49
Rent	0.46	0.50
Size	0.09	0.28
State of the building	0.05	0.22
	Educational characteristics	
Exchange student	0.03	0.18
Level of studies:		
Bachelor's level courses	0.80	0.40
Master's level courses	0.19	0.39
PhD program	0.02	0.13
Field of studies:		
Architecture	0.03	0.16
Arts and humanities	0.06	0.24
Business, administration and law	0.14	0.35
Engineering	0.25	0.43
Health and welfare	0.04	0.19
Information technologies	0.02	0.13
Natural science	0.16	0.37
Social science	0.30	0.46
# of observations	182	

Notes: The table presents descriptive statistics for Survey I respondents, showing the means and standard deviations for demographic characteristics, field of study, accommodation preferences, and level of study.

Table A4: Descriptive statistics of Survey II respondents

	Survey II respondents	
	Mean	SD
	Individual characteristics	
Age	22.29	3.89
Female	0.57	0.49
Number of social activities (per week)	3.85	2.94
At least one parent with a university degree	0.77	0.42
Number of semesters of study:		
One semester	0.16	0.36
More than two semesters	0.71	0.46
Two semesters	0.13	0.34
Employment status:		
Unemployed	0.85	0.35
Full-time employment	0.02	0.13
Part-time employment	0.13	0.34
	Current housing characteristics	
Having a roommate	0.66	0.47
Location of the residence:		
City of Lund	0.87	0.34
Lund municipality (not Lund city)	0.04	0.20
Skåne (not Lund municipality)	0.07	0.26
Other area	0.01	0.08
No answer	0.01	0.08
Contract duration		
Less than a month	0.03	0.16
Up to one semester	0.09	0.28
Up to one academic year	0.00	0.08
Entire study time	0.79	0.41
No answer	0.01	0.08
Notice period		
More than three months	0.01	0.12
Three months	0.14	0.35
Between one and three months	0.25	0.44
One month	0.47	0.50
Less than a month	0.02	0.13
No notice period	0.10	0.30
No answer	0.01	0.10
Type of contract:		
Own residence	0.02	0.14
Inherent	0.08	0.27
Tenancy, firsthand contract	0.70	0.46
Tenancy, secondhand contract	0.13	0.34
Other accommodation	0.06	0.25
No answer	0.01	0.09
# of observations	855	

Notes: The table presents descriptive statistics for Survey II respondents, showing the means and standard deviations of individual characteristics and current housing characteristics. The sample only includes the survey participants for whom there was gender and age variables available.

Table A5: Balancing tests on survey samples

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Age	Female	Immigrant	Graduate	Study grant, $t-1$	Employment, $t-1$	Annual income, $t-1$
Dependent variable							
				Panel A: All respondents			
Lottery rank (=1 if $\leq$ 200)	-0.0014	-0.0061	-	-	-	-	-
	(0.0029)	(0.0238)	-	-	-	-	-
Mean	21.562	0.560	-	-	-	-	-
# of observations	655	655	-	-	-	-	-
				Panel B: Restricted sample respondents			
Lottery rank (=1 if $\leq$ 200)	-0.0125	-0.0236	0.0996	-0.1102***	0.0553	-0.0210	-0.0000
	(0.0092)	(0.0388)	(0.1055)	(0.0201)	(0.0392)	(0.0396)	(0.0000)
Mean	20.531	0.500	0.059	0.035	0.756	0.567	1038.492
# of observations	254	254	254	254	254	254	254
				Panel C: Swedish respondents			
Lottery rank (=1 if $\leq$ 200)	-0.0085	-0.0159	-	-0.1039***	0.0451	-0.0045	-0.0000
	(0.0094)	(0.0390)	-	(0.0202)	(0.0401)	(0.0399)	(0.0000)
Mean	20.565	0.498	-	0.033	0.749	0.594	1070.264
# of observations	239	239	-	239	239	239	239
				Panel D: Newcomer respondents			
Lottery rank (=1 if $\leq$ 200)	-0.0002	0.0079	-	-	-	-	-
	(0.0035)	(0.0308)	-	-	-	-	-
Mean	22.921	0.602	-	-	-	-	-
# of observations	382	382	-	-	-	-	-

Notes: The table reports OLS estimates of lottery rank indicators on pre-determined characteristics. Panel A shows results for the full sample, Panel B for the restricted sample, Panel C for the Swedish sample, and Panel D for the newcomer sample. The significant estimates for the variable "graduate" can be due to the low number of graduate students (3%) compared to undergraduates. Robust standard errors are in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table A6: Multiple hypothesis testing

Outcome	**Raw p-value**	**Adjusted p-value**
Full-time employment	0.086239	0.110878
Part-time employment	0.722342	0.722342
Living in Lund	4.72e-11	4.25e-10
Having roommate	3.59e-06	1.08e-05
Social activities	0.216113	0.243128
Standardized grades	0.004060	0.006090
Top 10	0.000109	0.000245
Top 5	0.001111	0.002000
Housing Stability Index	1.95e-09	8.80e-09

Notes: The table reports the raw and adjusted p-values using Benjamini-Hochberg multiple hypothesis testing method. The raw p-values are obtained from the 2SLS regressions of several variables on an indicator of having accommodation by September, done on the full sample of Survey II respondents, using lottery rank lower than 200 as the instrument.

Table A7: Effects of student housing receipt by age group

Age Group	**N**	**Weighted Points**	**Top 5**	**Top 10**
Treatment: Accommodation by September				
Age < 20	623	0.4960***	0.1438*	0.2119**
		(0.1901)	(0.0831)	(0.0881)
Age 20-21	590	0.0518	-0.0035	0.0887
		(0.1673)	(0.0831)	(0.0887)
Age 22-23	303	0.0499	0.0861	0.1208
		(0.2133)	(0.1144)	(0.1237)
Age > 23	286	0.4523	0.2445	0.1741
		(0.3599)	(0.1490)	(0.1477)

Notes: The table illustrates 2SLS estimates of various student outcomes on a dummy variable for having accommodation by September while instrumenting the treatment with lottery rank (=1 if $\leq$ 200). The regressions are done separately for each age group. The estimates are calculated using the sample of lottery participants for whom there has been a detailed grade registered before 2023-01-01. Robust standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01

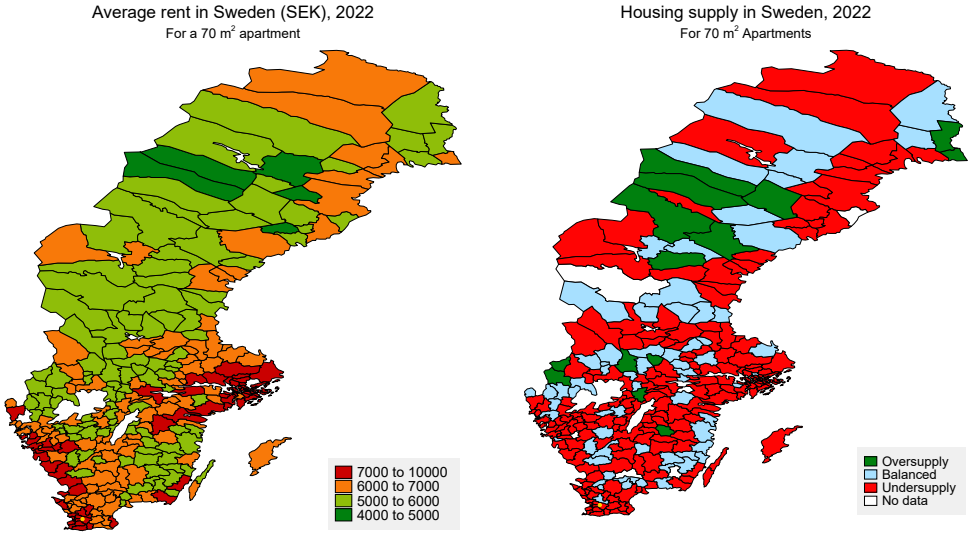
Table A8: Balancing tests on heterogeneity samples

	N	Female	Age
Age < 20	623	-0.0097	
		(0.0233)	
Age 20-21	590	-0.0230	
		(0.0206)	
Age 22-23	303	0.0271	
		(0.0288)	
Age > 23	286	-0.0083	
		(0.0353)	
Women	941		0.0023
			(0.0029)
Men	861		-0.0018
			(0.0028)

Notes: The table reports OLS estimates of lottery rank indicators on predetermined characteristics across different heterogeneity groups. Robust standard errors are in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

B Figures

Figure A1: Housing rent and supply variation across Sweden

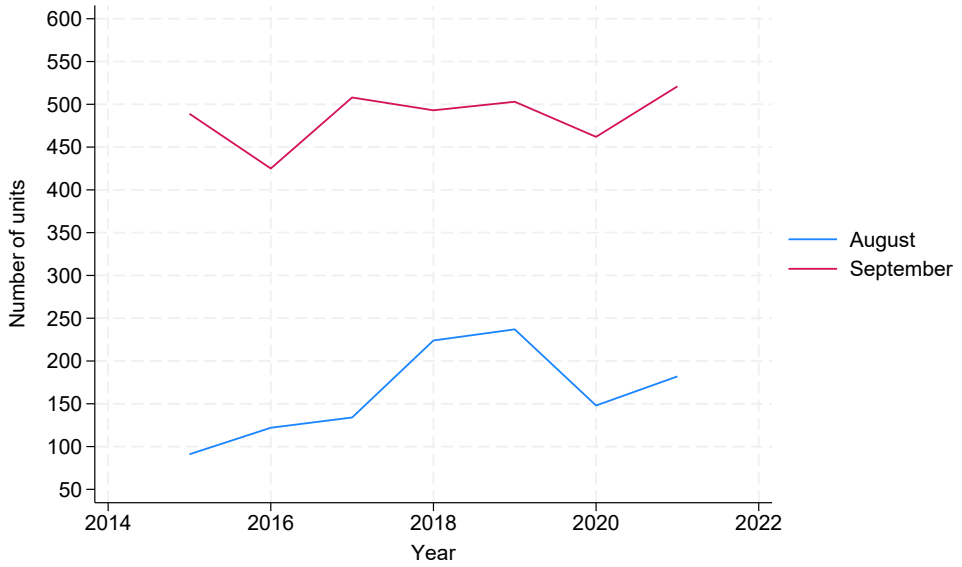


(a) Variation in rent (for 70 sqm units)

(b) Variation in supply/demand balance of housing (for 70 sqm units)

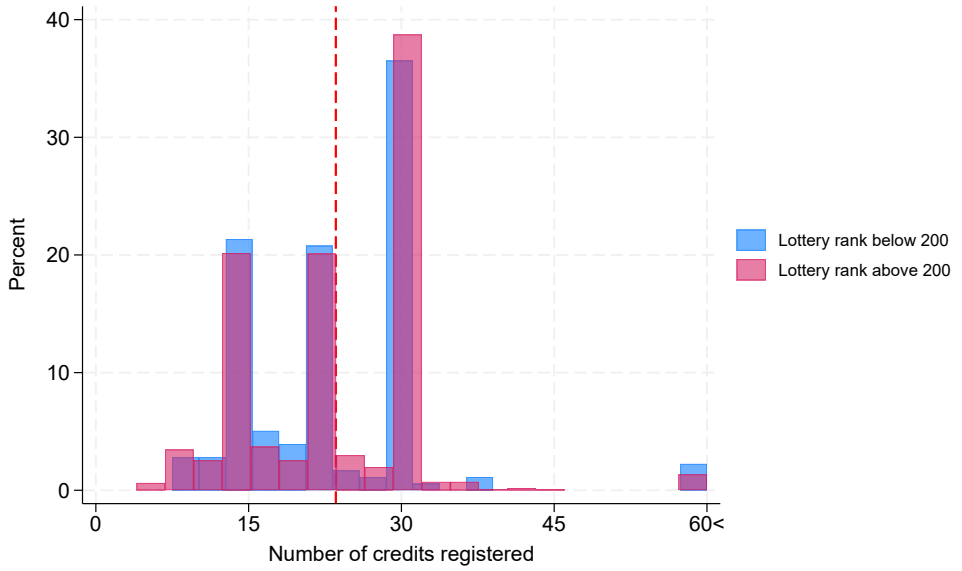
Notes: The figures above display the rent and housing supply variation across Sweden for 70 sqm units. The yellow dot marks the location of Lund Municipality. Data used to produce these figures was obtained from Bostadsmarknadsenkät 2022.

Figure A2: Variation in the number of housing units available to lottery participants
(2015-2021)



Notes: The figure above shows the variation in the number of housing units that became available to the lottery participants by AF in the months of August and September through years.

Figure A3: Number of credits registered for students by housing status



Notes: The figure above shows the distribution of credits registered by lottery participants, comparing those with a lottery rank below 200 to those with a rank above 200.

Figure A4: Survey I

Lund University study on student accommodation access and educational outcomes - **Preferences**

Note: Participation in this study is voluntary and will not affect your position in the AF Bostäder housing queue, accommodation eligibility, and accommodation allocation.

Consent: *By participation in this survey you consent to the processing of the personal data that you have provided for research purposes.*

* Indicates required question

1. First name *

2. Surname *

3. Email *

4. Identification number *

   Please fill in your personal identification number (normal format: YYMMDD-NNNN). If you do not have a Swedish personal number you have been given an identification number by Lund university (Personal Code) or the Swedish tax authority

5. Level of studies in the * upcoming semester

Mark only one oval.

- ◯ Bachelor's level courses
- ◯ Master's level courses
- ◯ PhD program

6. Exchange Student? *

Mark only one oval.

- ◯ Yes
- ◯ No

7. Field of studies *

_____

8. What aspect do you care about the most * in your accommodation?*

Mark only one oval.

- ◯ Distance to faculty
- ◯ Rent
- ◯ Size
- ◯ State of the building (newly built or renovated)

Rank your accommodation preferences from Most preferred ("1") to Least preferred ("4"):

9. Preference 1: *

Mark only one oval.

- Corridor room
- Studio / One-room apartment
- Two -room apartment
- Three-room apartment

10. Preference 2: *

Mark only one oval.

- Corridor room
- Studio / One-room apartment
- Two -room apartment
- Three-room apartment

11. Preference 3: *

Mark only one oval.

- Corridor room
- Studio / One-room apartment
- Two -room apartment
- Three-room apartment

12. Preference 4: *

Mark only one oval.

- Corridor room
- Studio / One-room apartment
- Two -room apartment
- Three-room apartment

Figure A5: Survey II

Lund University study on student accommodation access and educational outcomes - **January 2023 Round**

Note: *Participation in this study is voluntary and will not affect your position in the AF Bostäder housing queue, accommodation eligibility, and accommodation allocation.*

Consent: *By participation in this survey you consent to the processing of the personal data that you have provided for research purposes.*

.

* Indicates required question

1. Name *

2. Surname *

3. Identification number *

   Please fill in your personal identification number (normal format: YYMMDD-NNNN). If you do not have a Swedish personal number you have been given an identification number by Lund university (Personal Code) or the Swedish tax authority

4. Email *

5. 1. How long do you plan to study in Lund? *

   Mark only one oval.

   - ◯ One semester
   - ◯ Two semester
   - ◯ More than two semesters

6. 2. In addition to being enrolled in Lund University, do you work? *

   Mark only one oval.

   - ◯ Yes, full-time
   - ◯ Yes, part-time
   - ◯ No

7. 3. How many times in a week on average do you meet up with friends for socializing outside the university environment? *

   Please only insert the number

   _____

8. 4. Do you have at least one parent with a university degree? *

   Mark only one oval.

   - ◯ Yes
   - ◯ No

9. 5. Do you live at your current residence with one or more other people? *

   Mark only one oval.

   - ◯ Yes
   - ◯ No

Notes: Survey I

10. 6. Are you living in AF accommodation already? (As of the end of **January 2023**) *

Mark only one oval.

- ◯ Yes
- ◯ No

If your answer to question 6 is “No”, please answer questions 7 to 11:
If your answer is “Yes”, you can skip the rest of the questions.

Questions 7 to 11:

Please answer the following questions according to your status in **January 2023**.

11. 7. Where do you live today?

Mark only one oval.

- ◯ City of Lund
- ◯ Lund municipality, not Lund city
- ◯ Skåne, not Lund municipality
- ◯ Other area

12. 8. How do you live today?

Mark only one oval.

- ◯ Hyresrätt, förstahandskontrakt / Tenancy, firsthand contract
- ◯ Hyresrätt eller bostadsrätt, andrahandskontrakt / Tenancy or co-operative apartment, second-hand contract
- ◯ Bostadsrätt, egen bostad / Co-operative apartment, own residence
- ◯ Inneboende / Inherent
- ◯ Annan boendeform / Other accommodation
- ◯ Vill ej uppge/ Do not want to mention

13. 9. How long can you stay at your current address?

Mark only one oval.

- ◯ The entire study time
- ◯ Up to one academic year
- ◯ Up to one Semester
- ◯ Less than a month

14. 10. How long do you want to stay at your current address?

Mark only one oval.

- ◯ Throughout the study period
- ◯ Until something better appears
- ◯ I want to move as soon as possible

15. 11. How long is the notice period today at your current address?

Mark only one oval.

- ◯ No notice period
- ◯ Less than a month
- ◯ One month
- ◯ Between one and three months
- ◯ Three months
- ◯ More than three months

Notes: Survey II