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# The Labor Market Effects of Housing Subsidies: Evidence from Switzerland

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# The Labor Market Effects of Housing Subsidies: Evidence from Switzerland

Luca Moretti\*, Marco Schmid<sup>†‡</sup>

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## Abstract

There is an active debate about whether housing assistance policies distort labor market incentives. We investigate the so far neglected interaction between housing subsidy recipients' residential mobility and their job mobility. The setting for this is a large-scale, object-targeting housing assistance program in Switzerland launched in 1975. The WEG program offered substantial rent subsidies to low-income households for a limited duration. Leveraging variation in the timing of subsidy expiration in an event study, we show that WEG tenants have reduced residential mobility as long as subsidies are paid out but increase mobility once subsidies expire. Recipients' labor market response to subsidy expiration, however, is limited or even negative. Furthermore, we find that WEG out-movers, on average, experience an improvement in dwelling and neighborhood quality, but there is large variation in outcomes.

**JEL classification:** J2, J3, J6, R23, R38, R58

**Keywords:** Housing subsidies, residential relocation, neighborhood characteristics, labor market performance, job mobility

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# 1 Introduction

The issue of affordable housing has been at the forefront of the policy debate in many countries for the last decades and fueled by growing inequality is likely to remain one of the key challenges of modern societies. Most developed countries have implemented some form of housing assistance policy to ease the burden of housing costs for the most vulnerable members of society. In Austria, Denmark, England, France, the Netherlands and Sweden, for instance, at least 17% of the housing stock is social housing (Scanlon and Whitehead, 2007). The US federal government spends \$50 billion on housing assistance every year, corresponding to 1% of total spending. Housing assistance is often linked to specific dwellings which can be rented at a below-market rate. Such subsidy instruments are referred to as *object targeting*. In 2020, 2.1 million US households lived in object-targeted assisted housing, accounting for 1.8% of the population (Peterson Foundation, 2022).<sup>1</sup> In Switzerland, an ongoing national program for policy action aims at improving the education opportunities of disadvantaged individuals with affordable housing being one of the focus topics.<sup>2</sup> The program emphasizes that the lack of affordable housing is one of the key issues for poverty affected households and notes that nevertheless, the knowledge regarding the suitability and effectiveness of countermeasures is very limited. We hope that this paper can contribute to a more informed debate of housing policy interventions.

We analyze a large-scale, object-targeting housing assistance program in Switzerland. The WEG program offered substantial rent subsidies to low-income households, conditional on living in a program building. These subsidies were granted for a limited duration starting from the program entry date of the building. Our paper helps to better understand the unintended consequences of such housing assistance focusing on residential mobility and labor market outcomes. How do object-targeted housing subsidies affect recipients' residential mobility? Do housing subsidies provide access to better dwellings in better neighborhoods? Do they provide a springboard to move to a better dwelling in a better neighborhood in the future? Or does subsidy expiration put tenants in such financial distress that they are forced to move to worse dwellings in worse neighborhoods? How does it affect their job mobility, their earnings and consequently their entire career trajectories?

It is well known that residential mobility is substantially lower among tenants of subsidized dwellings compared to tenants renting on the free market, especially when the subsidy is object-targeted. This effect can be due to several factors, an important one being that since there is an excess demand for affordable housing, tenants are reluctant to give up their below-market-cost housing, even if it does not (or no longer) perfectly satisfy their needs in terms of location and dwelling characteristics. We refer to this as the *lock-in effect* of subsidized dwellings.

There are at least three mechanisms through which housing subsidies affect job mobility. The lock-in effect reduces the job search radius. Such a geographic constraint can result in worse matches

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<sup>1</sup>[www.pgpf.org/blog/2020/07/how-does-the-federal-government-support-housing-for-low-income-households](http://www.pgpf.org/blog/2020/07/how-does-the-federal-government-support-housing-for-low-income-households)

<sup>2</sup>Nationales Programm zur Prävention und Bekämpfung von Armut [www.bsv.admin.ch/bsv/de/home/sozialpolitische-themen/soziale-absicherung/lutte-contre-la-pauvrete.html](http://www.bsv.admin.ch/bsv/de/home/sozialpolitische-themen/soziale-absicherung/lutte-contre-la-pauvrete.html)



and longer unemployment duration. But there is also a *neighborhood access effect*. Subsidized housing allows tenants to live in a neighborhood they could otherwise not afford, offering attractive job opportunities. Finally, there is a *moral hazard effect* as every welfare program with an income based eligibility cutoff disincentivizes recipients to increase their earnings due to the high marginal tax rate beyond the cutoff. This income expansion disincentive increases the probability to stay in the current job.

The focus on career trajectories is motivated by the established empirical finding that job changes are important for career progression (Topel and Ward, 1992). The literature has shown that job mobility is key for career development and accounts for a large part of wage growth (Gregory et al., 2020). We analyze recipients' labor market histories in terms of earnings, labor force participation, job changes and unemployment spells. We argue that the consequences of dwelling-dependent subsidy programs are worse than a general job mobility reduction. The WEG program is likely to induce a one-sided decrease of beneficial job changes. While the probability of an involuntary job loss remains unchanged, proactive job changes are discouraged due to recipients' limited search radius. Hence, the question arises whether such subsidies depress career trajectories by preventing recipients from taking promising job opportunities or whether to the contrary, they provides access to upward mobility opportunities by enabling access to attractive resident locations. It is also interesting to study how WEG tenants cope with subsidy expiration. Recipients are confronted with a substantial rent increase once subsidies expire. We analyze how subsidy expiration affects residential mobility, household income, labor force participation, job mobility and in a next step also take-up of other welfare programs. Understanding and quantifying these effects provides the basis to design better housing assistance policies for the future.

Our project links administrative data from a battery of sources. We use data on WEG buildings and payed-out subsidies, which we link to the Swiss population register to get information on demographics and residential mobility records for the universe of Swiss residents from 2010 to 2020. Moreover, we link this to labor market histories, education attainment records, unemployment spells and social assistance records. Social security data allows to observe monthly employment spells, earnings and changes of employer since 1981. The social assistance records provide transfer payments based on other social aid programs than the WEG, which is important to check for welfare substitution effects.

We show that WEG dwellings are geographically well dispersed and cover the entire range of Swiss neighborhoods. Many WEG dwellings are located in high-quality neighborhoods with attractive employment opportunities. In terms of dwellings characteristics, WEG dwellings are slightly smaller but have a similar number of rooms as other rental apartments. For a typical 4-room WEG dwelling with average fit-out standard and location, the subsidy amounts to a rent reduction of about 35% below market rent. The majority of WEG dwellings received subsidies for either 19 or 21 years. Observables confirm that compared to free-market renters, tenants in subsidized WEG buildings are poorer and more likely to be vulnerable households such as single parent families, households with

many children or divorced households.

There are several sources of variation we can exploit for identification. The simplest is to use the fact that subsidy duration is tied to the program entry date of the building rather than the move-in date of the tenant. This generates interesting variation in the timing of expiration and in the number of subsidized years a tenant experiences. We can leverage this variation in an event study of recipients' behavior around the time of subsidy expiration to observe how they cope with the cease of subsidies, as well as to assess how recipients' moving probability behaves depending on housing tenure and remaining subsidy years. The second strategy is to exploit the discontinuity in subsidy eligibility based on the household income cutoff in a regression discontinuity design to compare subsidized to non-subsidized households within WEG buildings. The challenge here is that we do not directly observe subsidy reception but have to predict it using income data from social security records. The third and cleanest strategy is to use the various reforms extending benefit duration. We can exploit the fact that there is a cutoff in subsidy duration extension eligibility based on the entry date of the dwelling. To reduce the administrative burden only buildings with a sufficiently long remaining subsidy duration were eligible for the extension. This cohort study allows to estimate the effect of a longer subsidy period on recipients' behavior.

We find that the object-targeting subsidies for low-income households have a negative effect on recipients' residential mobility. The mobility rate of tenants of subsidized WEG buildings is 3.25pp (23.9%) lower than for renters on the free market. For inter-municipal moves, the mobility rate is even 38.1% lower, suggesting that conditional on moving, WEG tenants have a smaller geographic moving radius than free-market renters. We show that once the subsidy duration is exhausted, the mobility rate of WEG tenants increases substantially. In the first year after subsidy expiration, the probability of moving out of the WEG building is 1pp (7.9%) higher than during the subsidy period and stabilizes at this higher level. Hence, WEG tenants have a reduced residential mobility as long as subsidies are paid out but increase mobility once subsidies expire. These findings suggest that the lock-in effect is an important channel to explain the low residential mobility of tenants of subsidized housing. However, we do not find evidence for tenants of subsidized WEG dwellings to have significantly lower job mobility than free-market renters.

We find that WEG in-movers on average experience a slight deterioration of neighborhood quality, but there is large variation. In terms of neighborhood income, for 27.9% of WEG in-movers the relocation implies an increase, for 30.3% it means a reduction and 41.8% already live in the same neighborhood. Hence, for the majority of tenants the WEG program is not providing access to better neighborhoods, but it does for some. WEG out-movers, on the other hand, on average experience an improvement of dwelling and neighborhood quality, but again there is large variation. We find that tenants that move out of WEG buildings before subsidy expiration are positively selected compared to those staying till the expiration year. The WEG program does provide a springboard to a better future neighborhood for many tenants, especially for those moving before subsidies are exhausted, but that is not the case for all tenants. However, even if neighborhood quality fails to improve,

many tenants experience an increase in dwelling size as they move out of WEG dwellings, which can also be considered an improvement. Interestingly, we find a high attachment of WEG tenants to subsidized housing at move-in but not at move-out. 46.3% of tenants that move into a subsidized WEG dwelling had previously already lived in a non-profit dwelling, which suggest there could be some sort of insider advantage. At move-out, on the other hand, only 6.7% move on to another non-profit dwelling.

We do not find any effect of subsidy expiration on labor income and job mobility conditional on being employed. At the same time, we find that labor force participation decreases after subsidy expiration, especially for young men. Two years after subsidy expiration, labor force participation is 4pp lower than during the subsidy period. Hence, while most tenants stay in their current job, earning the same salary, some tenants drop out of the labor force after subsidy expiration. This is striking as it goes against the mechanisms that we suspected to be at play and needs to be investigated further. The results on the effect of housing subsidies on household income, labor force participation and job mobility are preliminary and will serve as a basis for further analysis.

The remainder of this paper is organized as follows. Section 2 provides a review of the housing assistance, labor market and neighborhood access literature. Section 3 describes the setting of the WEG housing subsidy program. Section 4 introduces the linked data sets. Section 5 explains three possible identification strategies. Section 6 presents preliminary results on the effect of housing subsidies on residential mobility, household income, labor force participation and job mobility. Section 7 provides a road map for further analysis. Section 8 concludes.

## 2 Literature

Our paper relates to at least five strands of literature. The first one is *how housing assistance affects residential mobility*. Common policy instruments to tackle the issue of affordable housing include rent controls and object-targeted housing subsidies. They allow low-income households to enjoy a decent housing standard and to live in locations they could otherwise not afford. However, empirical evidence shows that both policies tend to reduce residential mobility. Diamond et al. (2019) study the effects of rent control in San Francisco and find that it reduces renters' residential mobility by 20% in the short run with more ambiguous long run effects. Braakmann and McDonald (2020) find that in England housing subsidy recipients were more likely to move house after subsidy cuts. An effect that we also find when WEG subsidies expire. Kattenberg and Hassink (2017) look at housing tenure decisions in social housing in the Netherlands. They find that on average rent control, resulting in 40% below market prices, reduces transitions within the social housing sector but not transitions out of the social housing sector. Evidence from rent controls in New York in the 1990s indicates that rent-controlled households exhibit lower overall mobility rates (Gyourko and Linneman, 1989; Ault et al., 1994; Simmons-Mosley and Malpezzi, 2006). These findings are all in line with our finding of reduced residential mobility among WEG tenants. Also Munch and Svarer

(2002) and de Graaff et al. (2009) find that rent control reduces residential mobility of tenants in Denmark. Svarer et al. (2005) show that, as a result, the probability to find local jobs increases with rent control benefits, whereas the probability to find jobs outside the local market decreases. Evidence from New Jersey suggests that rent control increases commuting times due to a lack of household mobility (Krol and Svorny, 2005).

This relates to the second important strand of literature: *how housing assistance affects labor market decisions*. Borbely (2020) evaluates the impact of housing subsidy cuts on the labor market outcomes of claimants in England. The subsidy cuts were aimed at encouraging labor market participation and increasing work effort among claimants. He finds no evidence of a change in employment or hours worked for those affected by subsidy cuts. In our WEG context, we even find a reduction in labor force participation at subsidy expiration. Van Dijk (2019) studies the labor market effects of a public housing subsidy lottery in the Netherlands. She shows that the average move into public housing implies a deterioration of neighborhood quality and negatively affects earnings and labor supply, and increases public assistance receipt. However, she finds substantial heterogeneity in effects depending on the characteristics of the neighborhood in which housing is offered. She finds large positive labor market effects for those who receive housing in high-income neighborhoods but large negative effects for those who receive housing in low-income neighborhoods. She concludes that providing public housing in high-income neighborhoods can increase economic self-sufficiency. We can also distinguish between WEG tenants in high versus low quality neighborhoods and find large variation in tenants' neighborhood outcomes. Painter (2001) finds a negative effect of low-income housing assistance on labor force participation. He predicts that eliminating housing assistance would increase labor force participation in the US. Jacob and Ludwig (2012) find that randomized housing vouchers in Chicago reduced earnings and labor force participation but increased claiming of social assistance. They find no evidence that the housing-specific mechanisms hypothesized to promote work, such as neighborhood quality or residential stability, are important empirically. Alzúa et al. (2016) find that a social housing program in Argentina decreased employment by 7pp. The effect is especially strong for women and beneficiaries older than 50 years. They provide evidence of an income effect causing this result. All these papers only address the labor supply response in terms of labor force participation, earnings and hours worked but do not address labor mobility and resulting career trajectories. This is mainly due to data limitations, as these papers rely on tax data where employment spells are not observed. Thanks to linkage with social security data, we can observe employment spells, job mobility and income profiles. To the best of our knowledge there is no study that addresses job-to-job mobility and the resulting career trajectory effect of housing assistance. Except for Svarer et al. (2005) investigating the effects of rent control on unemployment duration in Denmark, we are not aware of any study that addresses the impact of housing assistance on labor market dynamics. The scope of our analysis is much wider as we analyze the entire career trajectory of recipients. Svarer et al. (2005) argue that since rent control increases the cost of moving, unemployed workers enjoying rent control benefits are less likely to search and accept jobs

outside their local labor market. They model the labor market as two regions: a local market and a national market excluding the current location. The model predicts that unemployed workers have a higher reservation wage for jobs in the national market than for jobs in the local market due to having to be compensated for giving up the housing subsidy. Empirically, they find that individuals occupying housing units with higher rent control benefits experience longer unemployment spells, when considering the transition to a job in the national labor market. In contrast, the unemployment duration to jobs in the local labor market are shorter for beneficiaries due to their lower reservation wage for local jobs. They find the net effect of rent control on unemployment duration to be indistinguishable from zero. Hence the cost of rent control mainly comes in the form of inefficient matches due to the local bias rather than increasing unemployment duration.

Such considerations are at the center of the third strand of literature: *Labor misallocation due to spatial frictions*. Heise and Przio (2022) study labor misallocation across firms and regions in Germany. In a quantitative labor market model, they distinguish between three types of frictions for the mobility of labor across space: moving cost, job searching cost and location taste. Their results highlight the potential labor market cost of long stays at a specific residence location as encouraged by the WEG subsidies. Bergman et al. (2019) provide experimental evidence on the barriers to neighborhood choice. They argue that most low-income families do not have a strong preference to stay in low-opportunity areas; instead, barriers in the housing search process are a central driver of residential segregation by income. We argue that the WEG program contributes to reducing residential segregation and increases equality of opportunity in Switzerland by providing affordable housing also in high-price neighborhoods.

Evidence from studies with home owners also shed light on the labor market costs of residential immobility. Blanchflower and Oswald (2013) show that in the US an increase in home ownership reduces labor mobility and in the long-run increases the local unemployment rate. Their argument is not that owners themselves are disproportionately unemployed but instead, that home ownership can produce negative externalities upon the labor market. Relatedly, Laamanen (2017) find that in Finland home ownership increases unemployment due to externalities. He argues that externalities arising from consumption reductions due to mortgage servicing and increased job competition due to lower reservation wages of home owners are the likely cause for higher unemployment among non-owners. Asquith (2018) shows that US homeowners who lose their job or suffer a housing wealth shock become less likely to move but instead more likely to retire. However, in the case of homeowners there is no work disincentive due to means-tested eligibility but only the spatial retention component.

The fourth strand of literature highlights the *importance of job changes for career development*. Gregory et al. (2020) using data from Denmark show how important job-to-job transitions are for earnings increases. Engbom (2022) documents that wages grow more over the life-cycle in countries where job-to-job mobility is more common. He argues that a more fluid labor market allows workers to faster relocate to jobs where they can better use their skills, incentivizing the accumulation of skills. Topel and Ward (1992) study the processes of job mobility and wage growth among young

men in the US. They show that job changes account for large part of early-career wage growth. Hence, job mobility is key for career development. Clemens and Strain (2022) show that minimum wage increases have limited importance for increasing the wages of minimum wage workers in the US. Much more important is labor market tightness and job mobility. They document that wage gains are commonly associated with industry and/or occupation switches. This highlights the importance of career progression for earnings growth of low-skilled workers.

The fifth strand of literature investigates how *neighborhood quality affects personal development*. Bilal and Rossi-Hansberg (2021) show that the location of individuals determines their job and schooling opportunities, amenities, and housing costs. They argue that location can be seen as an asset with current cost equal to the location’s rent, and a future payoff through better job and schooling opportunities. Investors in the location asset transfer resources into the future by going to expensive locations with high future returns. Borrowers, on the other hand, transfer resources to the present by going to cheap locations that offer few other advantages. Housing subsidies can relax this trade off by providing affordable housing at attractive locations. Focusing on the effects of neighborhood quality on children’s development, Chyn and Daruich (2022) develop a heterogeneous-agent overlapping-generations model with endogenous location choice and skill development. They argue that government policies that create exposure to high-quality neighborhoods for disadvantaged children increase welfare as they make up for the absence of intergenerational borrowing from their parents. The mechanism being that parents do not invest in a high quality environment for their children since they are borrowing constraint. They find that both housing vouchers and place-based subsidies result in welfare gains by reducing inequality and generating improvements in average skills and productivity. They find that a voucher program generates larger long-run welfare gains relative to place-based policies. But due to broader short-run gains, there may be more political support for place-based policies. A large literature leveraging the Moving to Opportunity Experiment evaluates the effect of neighborhood quality on children’s development (Novosad, 2022; Chyn, 2018; Chetty et al., 2016)). Davis et al. (2021) evaluate the effect of geographically restricted housing vouchers on adult wages of children. They suggest that a policy that restricts housing vouchers to the top 20% of neighborhoods maximizes expected aggregate adult earnings of children of households offered these vouchers. This suggest, that we should observe better outcomes for WEG tenants in higher quality neighborhoods. For this paper we focus on the labor market outcomes of subsidy recipients, but in the future we hope to use our setting to also study the educational outcomes of children.

### 3 The WEG program

We study a large Swiss housing subsidy program, featuring limited payout duration. The federal housing subsidy program based on the Housing Construction and Ownership Promotion Bill (WEG)<sup>3</sup>

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<sup>3</sup>The acronym that will be used throughout the paper is derived from Wohnbau- und Eigentumsförderungsgesetz, the German name of the law.

was launched in 1975 under the administration of the Federal Office for Housing (BWO).<sup>4</sup> The goal of the program was to promote the supply of affordable housing. There were two types of instruments implemented for the rental sector.<sup>5</sup> On the one hand, the *GV*, an unconditional object-targeting instrument, was intended to cushion the higher rents of newly built compared to older dwellings.<sup>6</sup> This instrument worked via repayable loans made available to developers agreeing to build affordable housing according to the WEG program's requirements. These loans had to be repaid by the time the dwellings exited the program – 25 years after entry. On the other hand, the *ZV*, a conditional subject-targeting instrument, was intended to further reduce the burden of rental expenditures for the weakest households.<sup>7</sup> This instrument worked via transfers granted for a limited duration since the program entry date of the dwelling.<sup>8</sup> Within the conditional subject-targeting instrument there are two types. The first type targets low-income households, while the second is for disabled and elderly households. As we are interested in the labor market effects of housing subsidies, our focus is on the first type. The three crucial features of the transfer instrument are that eligibility is conditional on living in a WEG program dwelling, tenants income has to be below an eligibility cutoff and that the subsidy is only available for a limited duration since the program entry date of the dwelling. This duration ranges from 10 to 21 years, depending on the date when the dwelling entered the program as there were several extension reforms. The first creates spatial frictions for tenants since their subsidies are tied to staying in a specific dwelling. The second incentivizes tenants to keep their income low, resulting in a moral hazard. The third generates the issue that beneficiaries can end up in a difficult situation when the subsidy duration of their building expires.

There were no restrictions on who can move into a WEG dwelling and the renting decision was at full discretion of the respective landlords. Besides rent reducing transfer payments for low-income households, also other WEG tenants benefited from a below market rent for 25 years since program entry. Rental rates for all tenants of a WEG building had to be set such that they are just cost-covering but do not generate excess profits for landlords. Hence, WEG dwellings provide attractive housing for a broad group of society rather than just the lowest earners. Figure 16 in the appendix provides an example for WEG housing. The WEG housing estate *Am Wasser* was constructed at an attractive location in the city of Zurich in 1999. It features seven rental apartment buildings with a total of 62 dwellings. The developer relied on WEG funding for the realization of the project and several tenants in the estate are receiving *ZV* subsidies.

From 1975 to 2008, about 71k rental units in entire Switzerland entered the WEG program. The majority of which were new units (73%) as the goal of the program was to increase the supply of affordable housing. Nevertheless, it was also possible to enter the program on the occasion of a substantial renovation. In almost all cases, all dwellings in a building were subject to the WEG. The

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<sup>4</sup>BWO stands for Bundesamt für Wohnungswesen.

<sup>5</sup>The law also entailed ownership promotion measures, which are not considered in this paper.

<sup>6</sup>GV stands for Grundverbilligung. The rents of newly build dwellings is higher due to being in brand new condition and often having a higher standard compared to older dwellings.

<sup>7</sup>ZV stands for Zusatzverbilligung

<sup>8</sup>In Swiss administrative language such transfers are referred to as *à fonds perdu* payments.

median WEG dwelling has a living surface of 86m<sup>2</sup> (mean 86.1m<sup>2</sup>) and consists 4 rooms (mean 3.44). Figure 1 depicts the distribution of dwellings entering the WEG program over time. The bulk of dwellings entered between 1990 and 1997. Hence, in a period when the Swiss economy and housing market were in distress. In 1991, a housing price bubble, fueled by lax mortgage lending, burst and the economy faced several years of stagflation (FuW, 2015).<sup>9</sup> The red line in Figure 1 shows the evolution of the housing vacancy rate. The housing vacancy rate reached 1.85% in 1998.<sup>10</sup> During that time period, joining the WEG program was attractive for investors as the lower rents helped to attract demand and keep vacancy rates low (Hanser et al., 1995). There is clearly a positive correlation between vacancy rate and the number of WEG entries. The WEG program was officially discontinued in 2001 (black dashed line in Figure 1), which halted the approval of new subsidies. However, all already granted subsidies were continued to be paid out for the designated duration. A few more housing units entered up until 2008 due to delays in the planning and construction process of already approved projects.

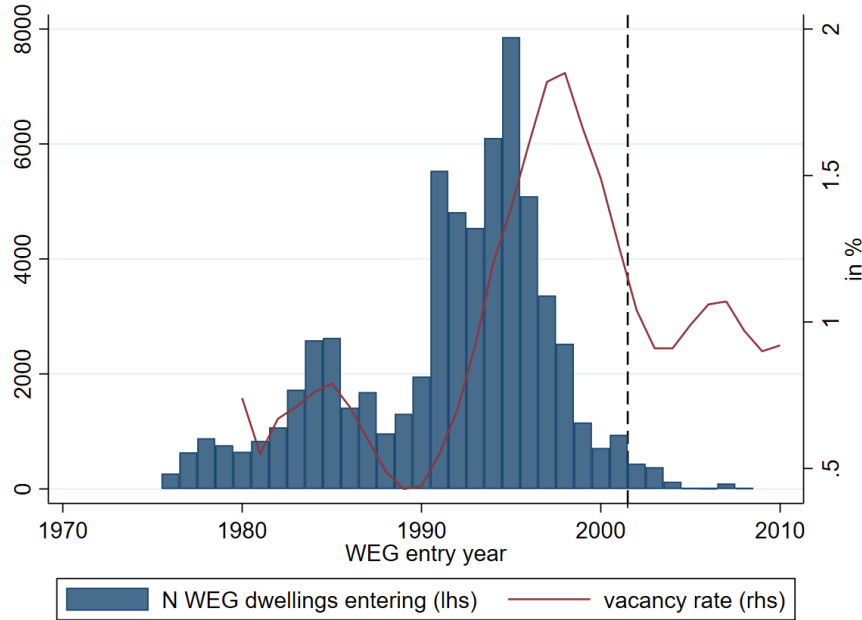


Figure 1: Dwellings entering the WEG program

As shown in Figure 2 the location of WEG dwellings is well dispersed over the entire populated area of Switzerland.<sup>11</sup> While there is some concentration of WEG dwellings in cities, the distribution is broadly proportionally to the local housing stock. At the example of Zurich, Figure 3 illustrates that WEG dwellings are also well distributed within cities. The number of WEG dwellings in the city of Zurich amounts to 2,975, which corresponds to 1.51% of the dwelling park in 2000. Having established geographic dispersion, we next describe the characteristics of WEG

<sup>9</sup>[www.fuw.ch/article/die-schweizer-immobilienblase-der-neunzigerjahre](http://www.fuw.ch/article/die-schweizer-immobilienblase-der-neunzigerjahre)

<sup>10</sup>BFS Leerwohnungsstatistik

<sup>11</sup>Due to the Alpine arch, a wide band from south-western to south-eastern Switzerland is very scarcely populated.



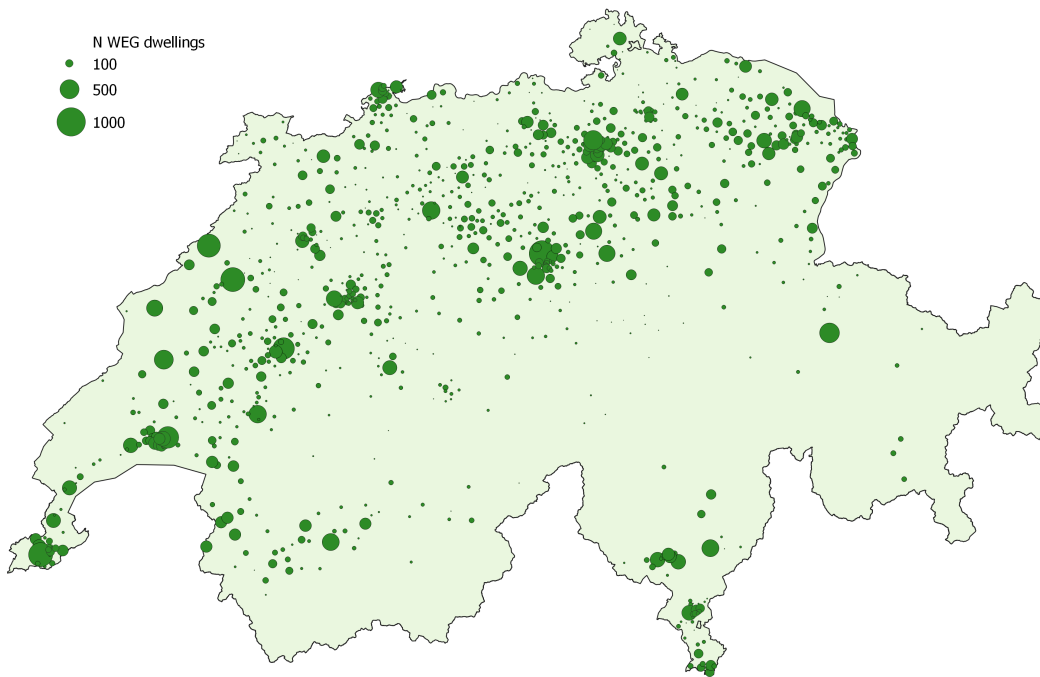


Figure 2: Location of WEG dwellings in Switzerland

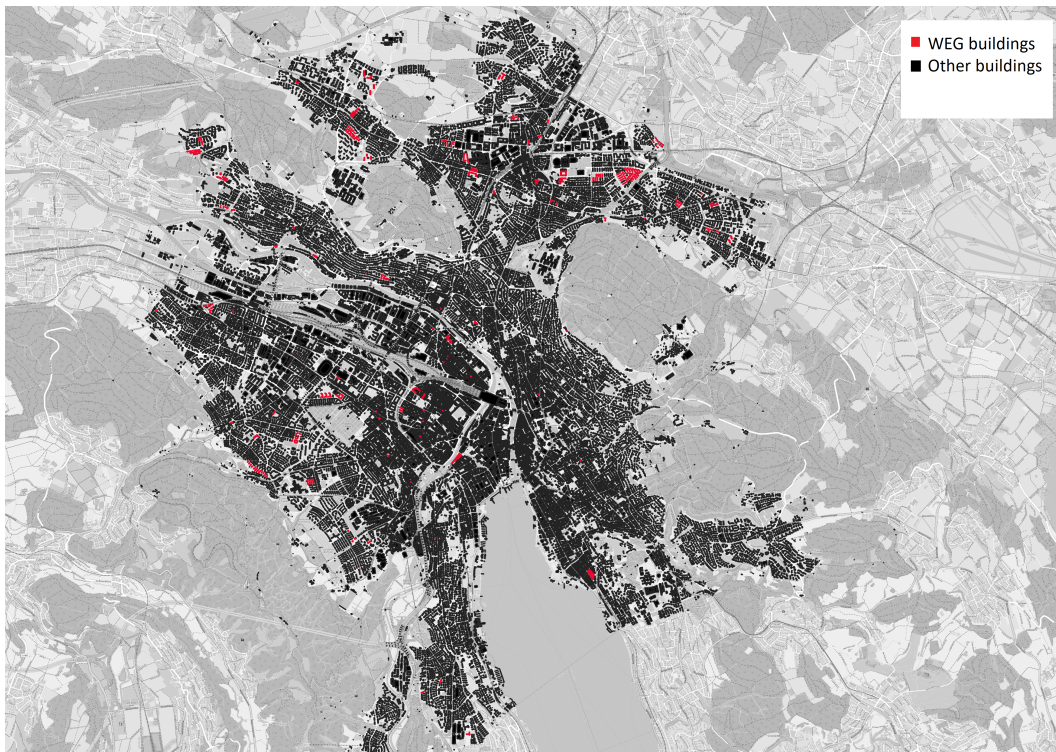


Figure 3: Location of WEG dwellings in the city of Zurich

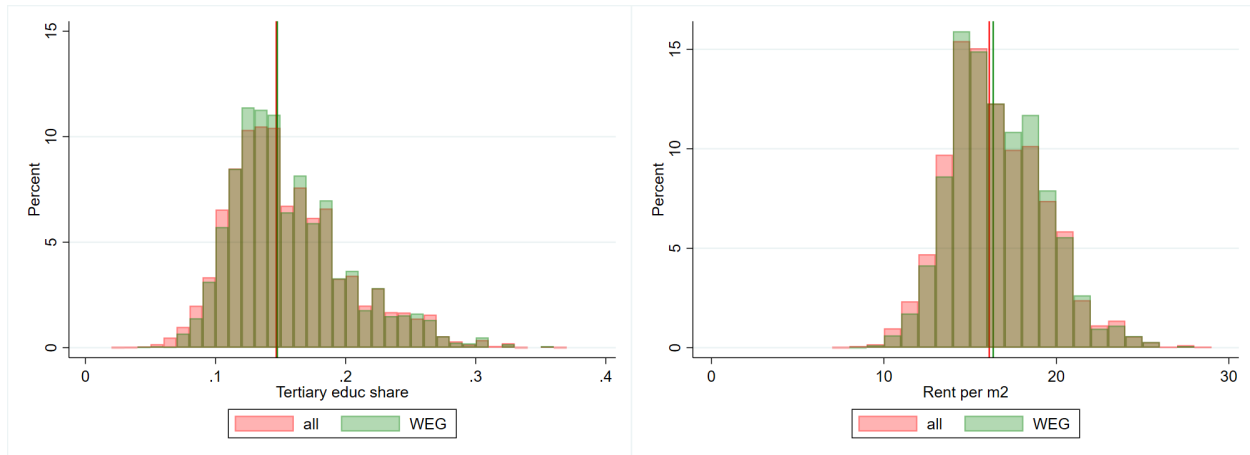


Figure 4: Distribution of neighborhood characteristics for WEG neighborhoods versus all Swiss neighborhoods

neighborhoods. Based on structural survey data from 2010-2019, Figure 4 shows the distribution of tertiary education share and the monthly net rent per m2 for neighborhoods with WEG buildings in comparison to all Swiss neighborhoods. For both indicators distribution and median are nearly identical.<sup>12</sup> This shows that WEG neighborhoods cover the entire range of Swiss neighborhoods. Hence, WEG dwellings are not concentrated in disadvantaged, poor neighborhoods but also common in high quality neighborhoods. Hence, the program can provide low-income households access to neighborhoods and housing conditions they could otherwise not afford. Table 7 in the appendix reports the distribution of further WEG neighborhood characteristics. Table 8 in the appendix provides a comparison of further characteristics of WEG versus non-WEG neighborhoods.

### 3.1 Subsidy generosity

We focus on the conditional subject-targeting subsidy for low-income households as we are interested in the labor market effects of housing subsidies. There are two stages of subsidies for low-income households. The first stage – called *ZV1* – is a yearly reduction of the rental rate by 0.6% of the investment value of the dwelling. The *ZV1* subsidy was payed out for a duration of 10-21 years depending on the program entry date of the building. Dwellings that entered the WEG program since January 1994 were eligible for a *ZV1* duration of 21 years. Dwellings that entered between July 1986 and December 1993 were eligible for a *ZV1* duration of 19 years. The majority of WEG dwellings received *ZV1* subsidies for either 19 or 21 years.<sup>13</sup> The second stage – the *ZV3* – is a yearly rent reduction of an additional 0.6% of the investment value for a fixed duration of 11 years *if and only if* the canton and/or municipality where the building is located contribute at least an

<sup>12</sup>The median tertiary education share in WEG neighborhoods is 14.7% and the net rent is 16.6 CHF/m2.

<sup>13</sup>See the Section 5.3 for more details on the subsidy duration reforms.

equal amount.<sup>14</sup>

The amount of the subsidy is determined by the investment value of the dwelling, which is the building's total land and construction cost broken down by dwelling. The WEG specifies construction cost limits depending on the number of rooms, the standard and the location of the dwelling and the provision of parking.<sup>15</sup> To this a surcharge of 15% can be added for the land value and another 10% for premium locations.<sup>16</sup> According to these regulations, the typical investment value for a 4-room WEG dwelling with average standard at average location amounted to CHF 285,000 in 2000.<sup>17</sup>

For a typical 4-room WEG dwelling with average standard and location the subsidy amounts to a rent reduction of 356 CHF per month.<sup>18</sup> This corresponds to about a 31% reduction in rent compared to non-ZV receiving WEG tenants. As the ZV is additional to an already below market rent, due to the cost-covering nature of WEG dwellings, this results in a 35.5% reduction below market rent for a typical ZV receiving household.<sup>19</sup> The defined target of the WEG program was to reduce initial rent 30% below cost rent for low-income households.<sup>20</sup> This was achieved by a combination of unconditional object-targeting (GV) and the conditional subject-targeting (ZV) instrument. Depending on the local market conditions the reduction can be somewhat higher or lower. The investment cost does allow for some adjustment to the local context. However, due to the larger wedge between cost and market rent at prime locations the reduction is likely to be larger there. Over the course of the WEG program, about 43,000 (60%) of rental units received ZV subsidies, with 34% going to low-income households and 26% going to disabled and elderly households. Between 1991 and 2020, CHF 1.28 billion of ZV subsidies for low-income households (ZV1+ZV3) were payed out.

Cantons and municipalities chose many different variants how to provide their support in order to reach eligibility for the federal top-up (ZV3). There were two main approaches. A few cantons simply payed out a subsidy of 0.6% of the investment value to eligible households during the first 11 years after the building's program entry. We refer to this approach as the *top-up* approach. For example, the canton of Schwyz chose this approach. Other cantons instead did not pay out the required subsidies during the first 11 years (or at least not fully) but rather accumulated them in a blocked account in order to start payout once the federal ZV3 subsidies expired, resulting in an extension of the subsidy period. We refer to this approach as the *extension approach*. The canton of Bern is an example for this approach, achieving an extension of the ZV3 by 4 years to a total of 15 years. Many cantons chose a mix between those two approaches. They both topped-up the federal

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<sup>14</sup>The ZV2 for disabled and elderly households granted a subsidy of 1.2% for 25 years, with an additional ZV4 of 0.6% for 25 years if there were equal local contributions.

<sup>15</sup>Verordnung über die Erstellungskosten bei Wohnbauvorhaben 843.143.1 Art. 2

<sup>16</sup>Verordnung über die Erstellungskosten bei Wohnbauvorhaben 843.143.1 Art. 3

<sup>17</sup>This estimate resulted after consultation with experts at the BWO confirmed that the legal cost limits were nearly binding.

<sup>18</sup>This is calculated with a total subsidy rate of 1.5% as the 0.6% of the canton where often not payed out fully but rather deferred to a later stage as explained below.

<sup>19</sup>In 2000, the average market rent for a 4-room apartment amounted to 1,198 CHF per month and the average cost rent to 1,129 CHF per month (BFS - Volkszählung 2000).

<sup>20</sup>WEG Art 35 Abs. 2b

subsidy and extend subsidy duration beyond the federal limit. The canton of Fribourg falls in this category, by paying a cantonal subsidy of 1.2% of the investment value for a duration of 25 years. There are also cantons that did not provide any WEG contributions such as Aargau. Finally, some cantons such as Geneva ran their own programs independently of the WEG.

### 3.2 Subsidy eligibility

There are clear eligibility rules for receiving ZV1 subsidies. Recipients must satisfy conditions on income, wealth and minimum occupancy. A household's total federally taxable yearly income must be below a specified income threshold to be eligible for ZV1.<sup>21</sup> Since the latest reform in July 1998, this income threshold is at CHF 50,000 with a bonus of CHF 2,500 for every minor child or first degree student living in the household. Similarly, there is a wealth threshold is at CHF 144,000 federally taxable household wealth with a bonus of CHF 16,900 per minor child or student. The income threshold roughly corresponds to the 25th percentile of the Swiss income distribution and the wealth cutoff to the 65th percentile of the Swiss wealth distribution.<sup>22</sup> In April 2004, a 10% tolerance band for incumbent recipients was introduced. This means that incumbent tenants of WEG dwellings only loose eligibility once their income or wealth surpasses the respective thresholds by more than 10%. The sharp eligibility threshold at the income cutoff implies a very high marginal tax rate at that point. This provides incentives to keep income below the cutoff, a moral hazard effect. Subsidy eligibility also requires a minimum occupancy of the dwelling. Since January 2001, the minimum occupancy for a dwelling with more than 3 rooms is that the number of inhabitants can be at most 2 lower than the number of rooms.<sup>23</sup> Hence, a 5-room apartment for example must at least be occupied by 3 tenants.

The procedure to obtain ZV subsidies is the following. At move-in, the landlord is required to check eligibility with every tenant. Cantonal tax offices provide the household's most recent income and wealth data. If the requirements are fulfilled the subsidy is payed out to the landlord, who is required to reduce the tenant's rental rate by that amount. Pass-through of the subsidy from the landlord to the tenant is well enforced as the relevant rent tables have to be made available to tenants and there is free legal counseling to handle disputes. Eligibility is tested every 2 years using the latest available tax data, which is the one of the previous year.

## 4 Data

Our project links administrative data from a wide variety of sources. Figure 5 illustrates the data linking structure. From the Federal Office for Housing (BWO) we have data on WEG buildings and

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<sup>21</sup>Federally taxable household income is the sum of household members income minus the usual deductions for insurance premia, saving interests, children in education and commuting cost. See Section 5.2 for more details.

<sup>22</sup>BFS Statistics on Income and Living Conditions (SILC).

<sup>23</sup>For dwellings with less than 3 rooms there is no requirement. In this consideration, the living room counts as one room whereas kitchen and half rooms are not counted.

payed out subsidies from 1976-2021. This data is at the WEG dossier level. A WEG dossier can contain several buildings, often forming a housing estate, and is active for 25 years after program entry. Key variables of this data set are the precise address, the program entry date, the yearly amounts of subsidies payed out by type (available since 1991) and the number of subsidized dwellings. Using the federal register of buildings and dwelling (GWS), we mapped the exact address information to the official Swiss building identifiers (EGID<sup>24</sup>). We were able to match 87.3% of WEG buildings (95.7% of WEG dwellings). In several cases the exact address was missing. Many of them could be completed by contacting the responsible cantonal offices or through manual search. We end up with matched data on 7,178 buildings in 3,369 WEG dossiers with a total of 63,070 dwellings. Based on the federal building identifiers, the Swiss Population and Households Statistics (STATPOP) allows us to identify the tenants living in WEG buildings from 2010 to 2020. STATPOP provides a unique person identifier that can then be linked to other register data. In addition it contains basic information on demographics and allows us to track residential mobility from 2011 to 2020 for the universe of Swiss residents.

The unique person identifier, provides the link from STATPOP to our other data sets regarding labor market histories, education, unemployment and social assistance. Social security data allows to observe monthly employment and unemployment spells, earnings, disability insurance payments and changes of employer since 1981. Social security in Switzerland, the so-called first pillar, is organized by a variety of compensation offices which assign employer identifiers. There are two main issues that arise from this. First, under certain circumstances employers can change the compensation office, in which case they will be assigned a new employer identifier. Second, in some cases compensation offices decided to assign new employer identifiers to all firms. In these cases, the link between years would be broken. To tackle this problem, we applied the worker-flow approach developed by Brenøe, Favre, Steinhauer and Zweimüller as described in Favre (2021). This algorithm matches employer identifiers across years based on the set of workers they employ. The basic logic is that if almost all workers reported under a specific employer identifier are reported under a different identifier in the next year, this must be the same employer.

The unemployment insurance data adds detailed information on unemployment spells and unemployment benefits. The social assistance data provides transfer payments based on other social aid programs than the WEG, which is important to check for welfare substitution effects. We also have access to data from the last full Census in 2000. The BFS provides a probabilistic matching to link individuals in the Census 2000 to STATPOP. We also have access to structural survey data from 2010-2020 which supplements STAPOPOP with detailed survey information on a representative subsample of the population. Especially the information on housing ownership type is important for our analysis. Finally, the educational attainment data (LABB) provides enrollment spells and obtained degrees across all schooling levels since 2012 and is used to study the educational paths of the children of WEG subsidy recipients.

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<sup>24</sup>EGID stands for Eidgenössischer Gebäude-Identifikator

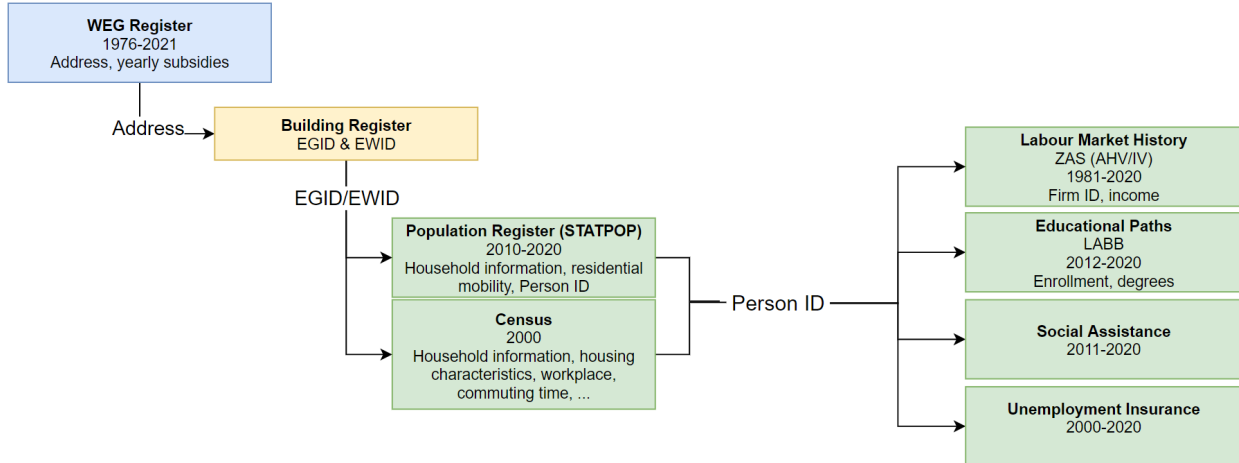


Figure 5: Linking of data sources

## 5 Identification strategies

There are several sources of variation we can potentially exploit to identify the effect of housing subsidies on residential mobility and labor market outcomes of recipients. The simplest is to use the fact that subsidy duration is tied to the program entry date of the building, generating variation in the timing of expiration and in the number of subsidized years tenants experience depending on their move-in timing. Subsection 5.1 lies out how we can leverage this variation in an event study design. Results of this design are presented in Section 6. A second strategy, could be to exploit the discontinuity in subsidy eligibility based on the household income cutoff. Subsection 5.2 sketches how this could be used in a regression discontinuity design to compare subsidized to non-subsidized households within WEG buildings. Alternatively, we could implement a difference. The third and cleanest strategy would be to use the various reforms extending benefit duration. Subsection 5.2 sketches how such a cohort study allows to estimate the effect of a longer subsidy period on recipients' behavior.

### 5.1 Event study at ZV1 expiration

We can exploit the fact that the duration of the ZV1 subsidy payments is tied to the program entry date of the building rather than the move-in date of the individual tenant. Therefore, two identical tenants moving into different WEG buildings in the same year can have different remaining subsidy duration. This generates interesting variation in the timing of expiration and in the number of subsidized years a tenant experiences. We can leverage this variation in an event study of recipient's behavior around the time of subsidy expiration to observe how they cope with the cease of subsidies. Moreover, we can use it to assess how recipients moving probability behaves with respect to housing tenure and remaining subsidy years. However, a causal interpretation hinges on the assumption that tenants' and landlords' rental choices are uncorrelated with the remaining ZV1 duration. We pursue

Variable	(1) (A) 0-1 Years	(2) (B) 2-3 Year	(3) (C) 4-5 Years	(4) (D) 6-9 Years	(5) (B)-(A)	(6) (C)-(B)	(7) (D)-(C)	(8) (C)-(A)	(9) (D)-(A)
Age	39.71 (7.26)	39.55 (7.31)	39.29 (7.26)	38.91 (7.03)	-0.16 (0.23)	-0.26 (0.17)	-0.38 (0.24)	-0.42* (0.22)	-0.80*** (0.28)
Share Male	51.85 (49.98)	51.70 (49.98)	51.53 (49.98)	49.82 (50.02)	-0.13 (1.60)	-0.19 (1.19)	-1.71 (1.67)	-0.31 (1.51)	-2.02 (1.98)
Share Married	50.82 (50.01)	53.36 (49.90)	52.57 (49.94)	53.91 (49.87)	2.52 (1.60)	-0.77 (1.19)	1.34 (1.67)	1.75 (1.51)	3.09 (1.98)
Share Divorced	0.75 (8.64)	0.71 (8.39)	0.88 (9.32)	0.62 (7.86)	-0.04 (0.27)	0.17 (0.21)	-0.25 (0.30)	0.12 (0.28)	-0.13 (0.33)
Share Swiss Citizen	46.92 (49.92)	49.98 (50.01)	54.85 (49.77)	56.04 (49.66)	3.08* (1.60)	4.85*** (1.19)	1.19 (1.66)	7.93*** (1.51)	9.12*** (1.97)
Household Size	3.04 (1.58)	2.98 (1.57)	2.85 (1.50)	2.83 (1.46)	-0.05 (0.05)	-0.13*** (0.04)	-0.02 (0.05)	-0.19*** (0.05)	-0.21*** (0.06)
Children below 14 years	0.82 (1.03)	0.83 (1.00)	0.80 (1.02)	0.81 (1.05)	0.01 (0.03)	-0.03 (0.02)	0.01 (0.03)	-0.02 (0.03)	-0.02 (0.04)
Children 14-18 or in education	0.15 (0.42)	0.16 (0.42)	0.13 (0.39)	0.13 (0.38)	0.01 (0.01)	-0.03*** (0.01)	0.00 (0.01)	-0.02 (0.01)	-0.02 (0.02)
Observations	1,462	2,965	4,341	1,126	4,427	7,306	5,467	5,803	2,588

Notes: Robust standard errors in parantheses.

\*\*\*, \*\*, \* denote statistical significance on the 1%, 5%, and 10% level, respectively.

Table 1: Characteristics of WEG in-movers by remaining ZV1 duration

two different approaches to verify the plausibility of this assumption. First, there is evidence from a survey among 804 WEG households conducted in 1993 (see Hanser et al., 1995). The survey finds that only 1.5% of WEG tenants actively searched for WEG housing and that only 54% are aware that they are living in a subsidized dwelling. This suggests that most WEG tenants are poorly informed about the program. Hence, it is unlikely that there is strong selection on remaining ZV1 duration. Second, we can compare the characteristics of new WEG tenants based on the building’s remaining ZV1 duration at the time of their move-in. We look at all tenants that moved into a WEG building between 2011 and 2020 and group them by remaining subsidy duration of their WEG building. Table 1 compares demographic characteristics of tenants moving into buildings with different remaining ZV1 duration. Columns 1-4 report the group means and columns 5-9 report the differences between them. Overall, the four groups seem to be remarkably balanced. The only noticeable differences are that new tenants with longer remaining ZV1 duration tend to be slightly younger (-0.8 years for the largest difference in remaining ZV1 years), have a slightly smaller household size (-0.21 members) and are substantially more likely to be Swiss citizens (+9.12pp). Moving forward, we will keep this in mind.

In Table 2, we report tenants’ income from various sources in the year before their move into a WEG dwelling. Note that WEG subsidies are not considered income as for households they come in form of a rent reduction rather than a transfer payment. Interestingly, total income tends to increase with remaining subsidy duration. This increase is entirely driven by wage income and coincides with an increase in labor force participation. Households moving into WEG dwellings with 6-9 years of ZV1 subsidy remaining have a CHF 4,000 (8.5%) higher total income than households moving into

Variable	(1) (A) 0-1 Years	(2) (B) 2-3 Year	(3) (C) 4-5 Years	(4) (D) 6-9 Years	(5) (B)-(A)	(6) (C)-(B)	(7) (D)-(C)	(8) (C)-(A)	(9) (D)-(A)
Share working	72.51 (44.66)	74.90 (43.37)	77.51 (41.76)	79.86 (40.12)	2.38* (1.41)	2.61** (1.01)	2.35* (1.39)	5.00*** (1.29)	7.34*** (1.70)
Total income	47163.27 (35443.66)	48126.98 (33861.23)	53296.39 (35551.14)	51163.63 (31820.17)	963.71 (1212.83)	5169.41*** (902.24)	-2132.76* (1246.52)	6133.12*** (1187.78)	4000.36*** (1459.07)
Wage income	43504.13 (36767.19)	44450.66 (35250.20)	49897.59 (37177.40)	47979.80 (33785.27)	946.53 (1261.06)	5446.93*** (941.89)	-1917.79 (1307.09)	6393.46*** (1239.71)	4475.67*** (1527.99)
UI payments	1547.04 (5491.02)	1603.07 (5884.69)	1384.83 (5987.92)	1445.83 (6038.87)	56.02 (203.29)	-218.23 (153.83)	60.99 (214.89)	-162.21 (196.31)	-101.22 (247.78)
Income from self-employment	1263.82 (8939.74)	1317.31 (9660.64)	1304.62 (9692.54)	1123.72 (6367.05)	53.49 (332.93)	-12.69 (250.41)	-180.90 (325.71)	40.80 (318.15)	-140.10 (339.44)
DI payments	271.96 (3163.08)	198.64 (2692.23)	200.88 (2874.31)	167.27 (2552.27)	-73.32 (100.60)	2.24 (72.49)	-33.62 (100.64)	-71.08 (98.53)	-104.69 (125.07)
Observations	1,448	2,952	4,304	1,122	4,400	7,256	5,426	5,752	2,570

Notes: Robust standard errors in parantheses.

\*\*\*, \*\*, \* denote statistical significance on the 1%, 5%, and 10% level, respectively.

Table 2: Income at t-1 of WEG in-movers by remaining ZV1 duration

WEG dwellings with only 0-1 years of ZV1 remaining. The results look the same if only households that fulfill the ZV1 eligibility criteria are considered.

If the quality of the buildings is independent of the remaining duration, then the combination of these facts suggest that it is the better situated individuals that are moving into dwellings with longer subsidy duration, which ceteris paribus are better dwellings. This selection could be due to being better informed about the program and being better connected, which is helpful both on the housing and on the labor market. If that is the case, it would imply that within the population of eligible households, subsidies do not necessarily go to the weakest households. The fact that poorer households are moving into the short subsidy duration dwellings could be due to them experiencing more distress, inducing them to accept less attractive dwellings, while richer households can afford to be more selective.

## 5.2 RDD exploiting ZV1 eligibility income cutoff

The income threshold for subsidy eligibility provides an alternative source of variation. We can exploit the discontinuity in subsidy eligibility based on household income in a regression discontinuity design (RDD), comparing WEG tenants that are just eligible versus just non-eligible for the ZV1 subsidy. Since eligibility is tested every 2 years, mobility in and out of eligibility is possible. The challenge here is that we do not directly observe subsidy reception but instead have to predict it using income data from social security records. To infer eligibility, we ideally would also have data on taxable household wealth, but this data is currently not available to researchers. However, it is sensible to assume that the wealth cutoff is not binding. In 1997, 65% of Swiss households had less than CHF 150,000 of wealth, the WEG eligibility wealth cutoff. Moreover, the sample of WEG tenants is certainly skewed towards low-income, low-wealth households. Hence, in the vast majority of cases labor income is decisive for ZV1 eligibility. Furthermore, compliance with take-up should



be fairly high since landlords are required to check eligibility.<sup>25</sup> Given a sufficient number of observations, a comparison within the same WEG estate is desirable as this would compare tenants facing the same local labor markets and children attending the same school.

In order to calculate the federal taxable household income, which as argued is the relevant measure for ZV eligibility, we sum up the household members income reported in the social security data and subtract the typical applicable tax deductions. The typical tax deductions from net income are a deduction for insurance premiums and interest on savings, a deduction for job related mobility expenses and a deduction for contributions to the third pillar<sup>26</sup> We account for differing deductions depending on marital status and additional deductions based on the number of minor children or students in their initial education.<sup>27</sup>

The conditions needed for this RDD to work are briefly discussed in the following. First, WEG dwellings must also be attractive for households with income above the eligibility threshold. This is needed in order to have observations on the right side of the discontinuity. This is satisfied as about 40% of tenants do not receive any ZV subsidies. Second, we need that our outcomes, such as residential mobility, are locally independent of income around the cutoff. We can support this by testing the local independence of baseline characteristics. A concern might be that eligible households have a larger incentive to search for WEG housing. Furthermore, they might be better connected and therefore more likely to succeed. However, the aforementioned survey found that only 1.5% of WEG tenants actively searched for WEG housing. Third, we also need that income is not perfectly controllable around the cutoff. The arguments that can be leveraged for this are that there is widespread inflexibility in work contracts. It is often not trivial to cut hours to reduce income by an exact amount.<sup>28</sup> Moreover, eligibility is based on taxable income of the previous year, so tenants need to be forward-looking to manipulate their eligibility. Furthermore, we can check for bunching below the threshold and for income reductions before moving into WEG housing. Another related identification strategy would be to match households in and out of WEG housing based on pre-WEG income profiles and compare them via a Difference-in-Difference approach.

### 5.3 Cohort study exploiting ZV1 duration reforms

The third and cleanest strategy is to use the various reforms extending benefit duration. We can exploit the fact that there is a cutoff in ZV1 duration extension eligibility based on the entry date of dwelling. Initially the ZV1 was granted for a duration of only 10 years and then got prolonged several times to 21 years finally. The latest extension, which is the one for which we have the best data, took place in 2014. Effective from January 1st 2014, ZV1 duration was extended from 19 to 21 years for

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<sup>25</sup>Even if compliance were imperfect this would not be much of an issue. Then the estimate is just a lower bound of the true effect since take up is bounded between 0 and 1.

<sup>26</sup>We make the assumption that individuals contribute 1/4 of the maximum allowed amount to the pillar 3a, as low-income households have a relatively low savings rate.

<sup>27</sup>We assume that household spend a median amount on external childcare.

<sup>28</sup>The flexibility induced by third pillar contributions, which are tax deductible, poses a threat to this but does require that households have a positive saving rate.

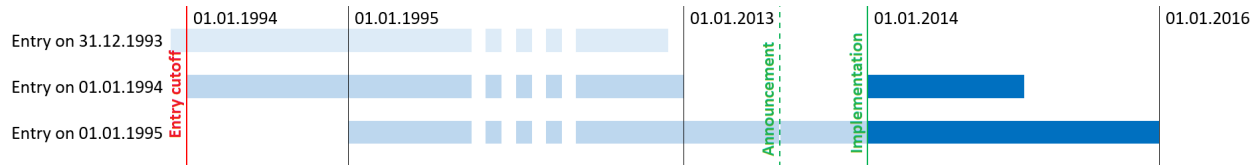


Figure 6: 2014 ZV1 subsidy duration reform

dwelling that had entered the program since January 1994.<sup>29</sup> To reduce the administrative burden, the extension was only granted to dwellings for which the new remaining ZV1 duration exceeded 12 months and subsidies were never paid retroactively. Hence, dwellings that entered before 1994 were not eligible for this extension.<sup>30</sup> This creates an exogenous source of variation based on a dwelling's program entry date. Figure 6 illustrates the consequences of the reform. The ZV1 subsidy eligibility for a dwelling that entered before 1994 expires after 19 years. A dwelling that entered on 01.01.1994 is ZV1 eligible for 19 years, has a gap of 1 year and then is ZV1 eligible for another year in 2014. A dwelling that entered on 01.01.1995 is ZV1 eligible for 21 years without interruption. Figure 7 shows the resulting variation in the subsidy amount per dwelling payed out for three differently affected entry cohorts. The sample is restricted to ZV1 eligible dwellings. First, note that the expiration of the ZV3 eligibility after 11 years is nicely visible. The paid out subsidies are very similar for all cohorts the first 19 years since the building's program entry. In year 19, the payments of the 1993 entry cohort drop to zero as subsidies expire. The payments of the 1994 entry cohort also drop after 19 years but bump up again for an additional year thanks to the extension. Finally, for the 1995 entry cohort the subsidies payed out remain constant for the full 2 extra years thanks to the extension. An additional year of ZV1 subsidy on average amounts to an extra CHF 1,400 paid out per dwelling. This amount to a monthly ZV1 subsidy of CHF 117 per dwelling, which is lower than the amount derived in Section 3.1 since ZV3 duration has been exhausted by then in any case. The extension roughly corresponds to a 10% rent discount below market value or a 3% higher household income. Even though the treatment intensity is not huge, this can have sizable effects on labor market behavior. The subsidy extension provides incentives to stay in the current dwelling and hence also in the current job for longer than without the extension. This variation can be used in a cohort study, where we compare the outcomes of tenants that live in WEG dwellings that entered the program after 1995, and hence received the ZV1 subsidy for an extra 1 to 2 years, to tenants that live in WEG dwellings that entered before 1994. In terms of sample size we there are about 4,500 dwellings that entered in 1993, 6,000 in 1994 and 7,900 in 1995. In order to have a well identified setting, in which we can claim that observed differences in labor market behavior are due to exogenous variation in the subsidy duration, we need to verify that there are no systematic

<sup>29</sup>The reform was announced in August 2013. The motivation for the reform was to extend the generosity for low-income households. It was developed in the context of the accompanying measures to accommodate the labor and housing market effects of the Agreement on the Free Movement of Persons between Switzerland and the European Union.

<sup>30</sup>The duration of the ZV3 remained unchanged at 11 years throughout the entire program history.

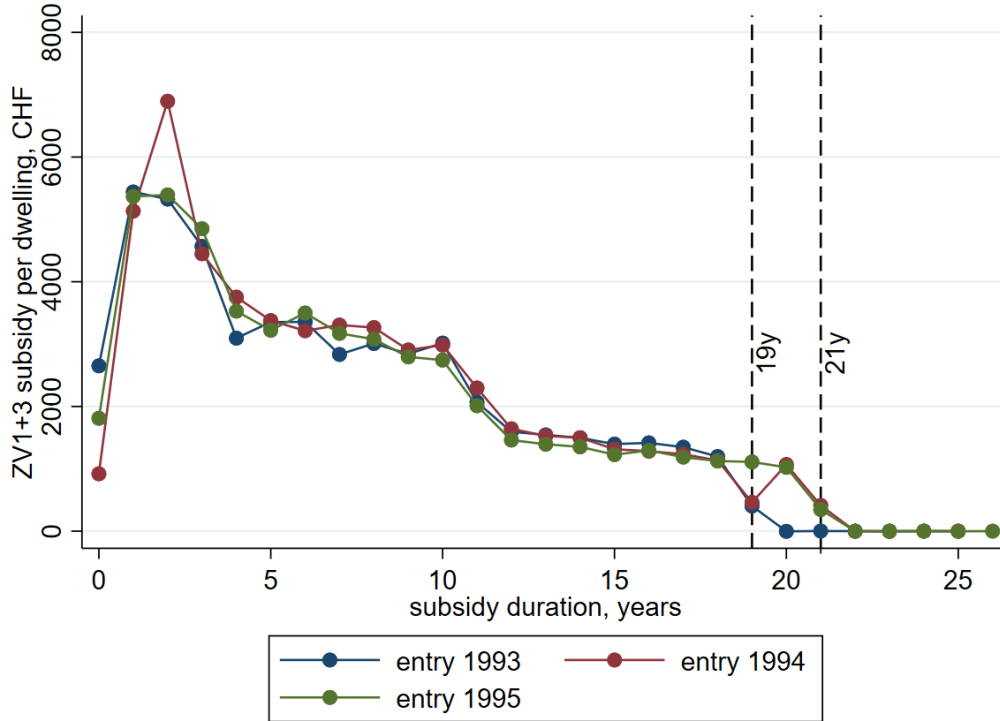


Figure 7: Average subsidy amount payed-out for 3 entry cohorts

differences between dwellings and tenants across the entry threshold. Table 9 in the appendix shows that building and neighborhood characteristics are well balanced across entry cohorts. Hence, the described cohort study allows to estimate the effect of a longer subsidy period on recipients' behavior.

## 6 Results

We study the effect of housing subsidies on three main outcomes: residential mobility, household income and job mobility. These outcomes are naturally interconnected. The housing location determines the set of employment opportunities and other neighborhood qualities. Household income affects housing choice and job mobility often requires residential mobility. Finally, job mobility is important for household income development.

### 6.1 Effect of housing subsidies on residential mobility

It is well known that residential mobility is substantially lower among tenants of subsidized dwellings compared to tenants renting on the free market, especially for object-targeting subsidies. This effect can be due to several factors, an important one being that since there is an excess demand for affordable housing, tenants are reluctant to give up their below-market-cost housing, even if it does not (or no longer) perfectly satisfy their needs in terms of location and dwelling characteristics.

We refer to this as the *lock-in effect* of subsidized dwellings. Another factor could be that tenants of below-market-cost housing form especially tight communities as it is often observed in housing cooperatives, which typically actively encourage community building.

Using data from the Swiss population registry STATPOP, the structural survey SE, social security records and the building register GWS for the period 2010 to 2020, Table 3 compares the characteristics of individuals living in three different types of housing. *WEG active* are tenants living in WEG dwellings with ongoing eligibility for ZV1 subsidies. *Non-profit* are tenants renting non-profit dwellings such as state owned dwellings.<sup>31</sup> This does not include housing cooperative members as the housing cooperative model is a mix between renting and ownership, inducing even lower mobility rates. Finally, *Free Market* are tenants renting their dwelling on the competitive market. We restrict the sample to individuals aged 30 to 55 and living in a household with at most 9 members. We calculate the average yearly probability of moving to a different building, a different neighborhood and a different municipality. The moving probability is defined as the share of tenants who in year  $t + 1$  no longer resides in the same location as in year  $t$ . The probability of moving to a different building for tenants in WEG buildings with active ZV1 subsidies is 10.34%, compared to 9.19% in non-profit buildings and 13.58% in free market buildings.<sup>32</sup> Hence, in terms of their moving behavior tenants in WEG buildings with active ZV1 subsidies behave similarly to tenants in other non-profit buildings but are substantially less mobile (-3.25pp or 23.9%) than tenants renting on the free market. This also holds for mobility to a different neighborhood and to a different municipality as reported in the top panel of Table 3. For inter-municipal moves the mobility of tenants in WEG buildings with active ZV1 subsidies is even 38.1% lower than for free-market renters. This suggests that conditional on moving, WEG tenants have a smaller geographic moving radius than free-market renters. Hence, these findings confirm the prior that tenants of subsidized buildings have a reduced residential mobility rate.

The middle panel of Table 3 reports job and demographic characteristics. Compared to free-market renters, WEG tenants have a CHF 24,700 (20.9%) lower household income. We measure job mobility by the job-to-job transition rate, which is the share of tenants that is employed at a different firm in year  $t$  compared to year  $t - 1$ . The job-to-job transition rate of WEG active tenants is 18.24%. Compared to tenants in other non-profit dwellings, job mobility of WEG active tenants is slightly higher (+0.77pp). However, it is not significantly different from the job mobility of free-market renters. Hence, it seems that job mobility does not systematically differ between the three groups. Compared to free-market renters, WEG tenants are 8.64pp (16.4%) more likely to be married, 0.32pp (51.6%) more likely to be divorced, 1.86pp (3.1%) more likely to have Swiss citizenship, 4.42pp (8.8%) more likely to be female and are 1.13 years older. Moreover, they have

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<sup>31</sup>Differentiating between profit and non-profit buildings is only possible since 2016. Hence, we assume that all 2016 non-profit buildings that already existed in the years 2010-2015 were already non-profit buildings back then.

<sup>32</sup>Statistics from the city of Zurich provide a comparison for these values. They report a fluctuation rate of 7.3 % for non-profit dwellings and 14.1% for free-market renters. The reason for the substantially lower mobility rate for non-profit dwellings is that we do not include housing cooperative members in our non-profit sample. They have a moving probability of 6.9% in our data.

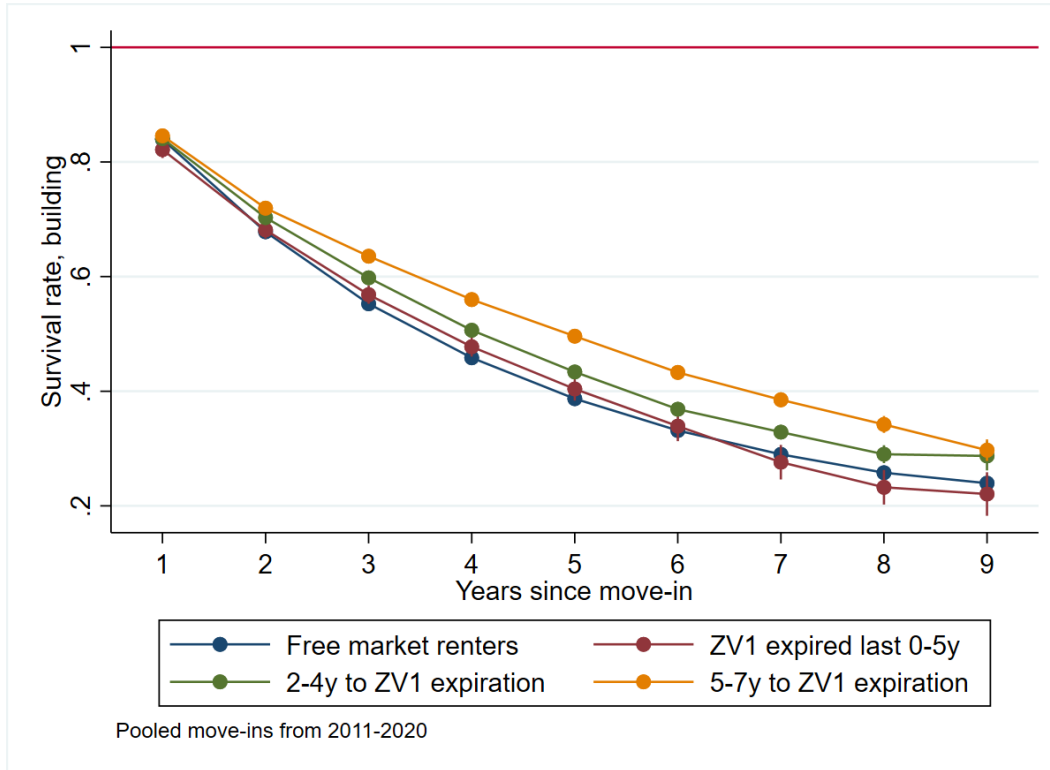


Figure 8: Survival rate by tenancy for WEG tenants and free-market renters

lived in the municipality for 3.15 years longer and are living in a 0.64 members (24.7%) larger household. They are also more likely to have children than free market tenants. These findings suggest that tenants in WEG buildings with active ZV1 subsidies are poorer and more likely to be vulnerable households such as single parent families, households with many children or divorced households.

The bottom panel of Table 3 reports the dwelling characteristics. Compared to dwellings of free-market renters, dwellings of WEG tenants are 4.04m<sup>2</sup> (4.4%) smaller but have a similar number of rooms.

Figure 8 compares the building-level survival rate for WEG tenants with different remaining ZV1 subsidy duration at move-in and free-market renters. Move-ins from 2011 to 2020 are pooled and aligned at the move-in year. In the first year since move-in about 85% of tenants remain in the same building. After 5 years, this has declined to 38.7% for free market rental buildings but only to 51.9% for WEG buildings which still offer ZV1 (the 5-7 years group). On the other hand, tenants in WEG dwellings where ZV1 duration has already expired have a similar, or in the medium run even lower, survival rate than free-market renters.

These findings suggest that WEG tenants have a reduced residential mobility as long as subsidies are paid out but that this is no longer the case once subsidies have expired. Interesting is therefore to observe how tenants behave when subsidies expire. We again focus on the expiration of the ZV1 subsidy, which targets low-income households. Figure 9 plots the yearly number of dwellings whose

	WEG active [T]	Non-profit [C1]	Free Market [C2]	C1-T	N1	C2-T	N2
<b>Residential mobility</b>							
Change egid t+1, %	10.34 (30.45)	9.19 (28.88)	13.58 (34.26)	-1.15 (0.24)***	96,017	3.25 (0.12)***	616,163
Change nhood t+1, %	7.22 (25.89)	6.41 (24.49)	10.24 (30.32)	-0.81 (0.20)***	96,017	3.02 (0.10)***	616,163
Change municip t+1, %	5.19 (22.18)	3.82 (19.17)	8.39 (27.72)	-1.37 (0.16)***	96,017	3.20 (0.09)***	616,163
<b>Demographics</b>							
HH income, CHF p.a.	93,622 (64,047)	94,476 (58,364)	118,315 (104,537)	853 (504)*	92,492	24,693 (279)***	546,580
Job-to-job transition, %	18.24 (38.61)	17.47 (37.97)	18.25 (38.63)	-0.77 (0.36)**	71869	0.02 (0.17)	459009
Married, %	61.27 (48.71)	61.49 (48.66)	52.63 (49.93)	0.23 (0.39)	96,017	-8.64 (0.19)***	616,163
Divorced, %	0.94 (9.66)	0.93 (9.59)	0.62 (7.86)	-0.01 (0.08)	96,017	-0.32 (0.04)***	616,163
Swiss, %	62.10 (48.51)	60.23 (48.94)	60.24 (48.94)	-1.87 (0.39)***	96,017	-1.86 (0.19)***	616,163
Male, %	45.61 (49.81)	47.68 (49.95)	50.02 (50.00)	2.07 (0.40)***	96,017	4.42 (0.19)***	616,163
Age, %	42.56 (7.31)	42.45 (7.48)	41.43 (7.51)	-0.12 (0.06)*	96,017	-1.13 (0.03)***	616,163
Y in municip	13.36 (10.93)	14.17 (11.59)	10.21 (10.77)	0.81 (0.09)***	96,009	-3.15 (0.04)***	616,145
HH size	3.23 (1.51)	2.98 (1.39)	2.59 (1.31)	-0.25 (0.01)***	96,017	-0.64 (0.01)***	616,163
N young children	0.85 (1.03)	0.78 (0.99)	0.62 (0.90)	-0.07 (0.01)***	96,017	-0.23 (0.00)***	616,163
N old children	0.26 (0.53)	0.21 (0.47)	0.12 (0.37)	-0.05 (0.00)***	96,017	-0.14 (0.00)***	616,163
<b>Dwelling</b>							
Dwelling surface, m2	87.22 (25.34)	84.31 (24.19)	91.25 (37.47)	-2.91 (0.20)***	95,876	4.04 (0.10)***	614,022
N rooms	3.51 (0.97)	3.49 (0.94)	3.49 (1.23)	-0.03 (0.01)***	95,876	-0.02 (0.00)***	614,022

Notes: Robust standard errors in parantheses.

\*\*\*, \*\*, \* denote statistical significance on the 1%, 5%, and 10% level, respectively.

Table 3: Characteristics of tenants in WEG, non-profit and free market buildings

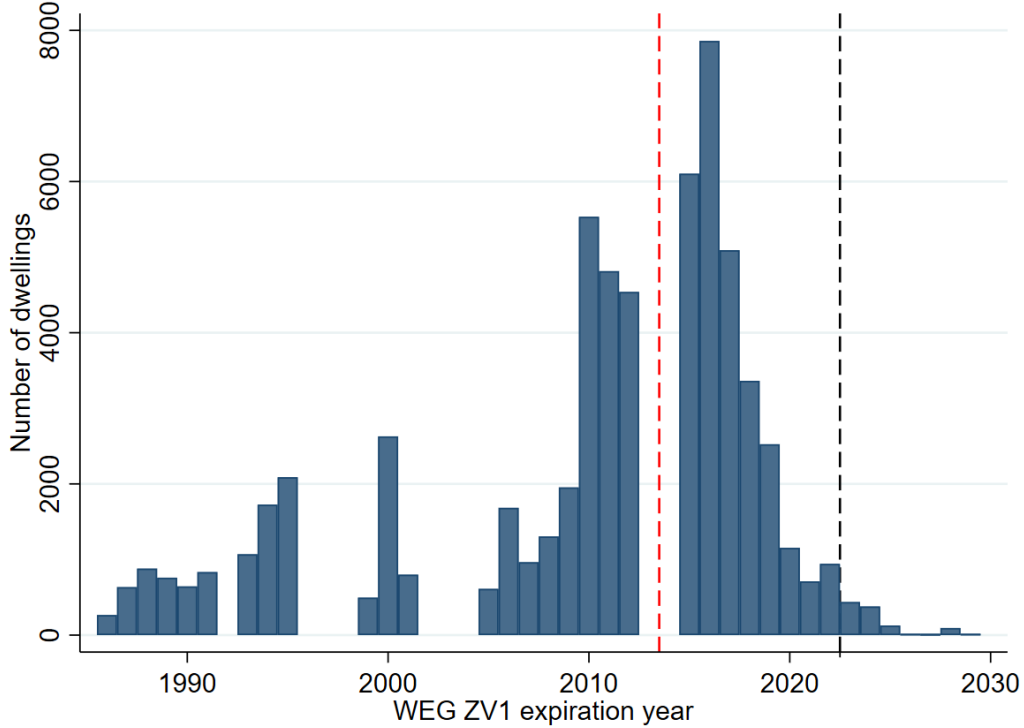


Figure 9: Yearly number of WEG dwellings experiencing ZV1 expiration

ZV1 duration expire. The bulk of expiration occurs between 2010 and 2019 with a gap in 2013/2014 due to the 2014 duration extension reform (cf. Figure 6).

As shown in Section 3.1, the expiration of the ZV1 subsidy on average implies a rent increase of 1,400 CHF per year which corresponds to a reduction in household income of about 3%. We use two different approaches – one on the individual-level and one on the dwelling-level – to estimate the effect of subsidy expiration on residential mobility. First, we look at the moving probability on individual level. For this we perform a panel event study on the probability of relocating to a new location in the following year  $t + 1$  conditional on living in a WEG dwelling in the current year  $t$ . In other words, what is the probability of moving out of a WEG building over the subsidy cycle. We are interested in estimating the impact of an event – ZV1 expiration – which occurs at different times in different WEG buildings and hence for the individuals living in that building. We follow the approach described in Clarke and Schythe (2021) and align the moving history of all tenants of WEG buildings  $s$  around the time of ZV1 expiration Event  $_s$  of their building. Denoting a tenant’s  $s$  moving probability at time  $t$  as  $y_{st}$ , the estimating equation is

$$y_{st} = \alpha + \sum_{j=2}^J \beta_j (\text{Lag } j)_{st} + \sum_{k=1}^K \gamma_k (\text{Lead } k)_{st} + \mu_s + \lambda_t + X'_{st} \Gamma + \varepsilon_{st}, \quad (1)$$

where  $\mu_s$  and  $\lambda_t$  are individual and year fixed effects, respectively.  $X_{st}$  are time-varying controls

such as age and marital status, and  $\varepsilon_{st}$  is the unobserved error term. A desirable control would also be dwelling tenure. However, as residential location is only since 2010, these data limitations do not allow for a meaningful control of tenure. Lags and leads to the ZV1 expiration year are defined as follows:

$$\begin{aligned} (\text{Lag } J)_{st} &= \mathbf{1}[t \leq \text{Event}_s - J], \\ (\text{Lag } j)_{st} &= \mathbf{1}[t = \text{Event}_s - j] \text{ for } j \in \{1, \dots, J - 1\}, \\ (\text{Lead } k)_{st} &= \mathbf{1}[t = \text{Event}_s + k] \text{ for } k \in \{1, \dots, K - 1\}, \\ (\text{Lead } K)_{st} &= \mathbf{1}[t \geq \text{Event}_s + K], \end{aligned}$$

where  $\text{Event}_s$  is the year of ZV1 subsidy expiration for the building of individual  $s$ . We pick the year before subsidy expiration  $t - 1$  as the baseline year. Figure 10 plots these relocation probabilities for the yearly time periods relative to the magnitude in year  $t - 1$ . The regression results are shown in Table 4. We see a sharp rise in the probability of relocation starting from  $t0$  – the year the ZV1 subsidy expired. The relocation rate in  $t0$  is 0.75pp higher than in  $t - 1$ , which corresponds to an increase of 5.9%.<sup>33</sup> In the following period, the relocation rate keeps increasing and stabilizes on a level of around 1pp (7.9%) above the baseline level. There is no anticipatory effect visible in the years right before expiration, but before  $t - 3$ , the relocation probability is significantly lower. This is not surprising as the incentives to move out of a WEG dwelling are lower the more years of subsidy duration are remaining as shown in Figure 8. However, strictly speaking this violates the no pre-trend requirement for a well identified event study. Nevertheless, there is evidence that the expiration of subsidy significantly increases the probability of moving out of a WEG building. The fact that the effect size increases and that there is no anticipation effect in the 3 years before the ZV1subsidy eligibility expires suggest some inertia. Many tenants seem to only start looking for new dwelling once the ZV1 subsidy has expired and it takes them some time to find a new dwelling. In Section 6.2, we show that tenants that move out of WEG buildings before ZV1 expiration are positively selected, while those staying till expiration are negatively selected.

Figure 17 in the appendix shows the relocation probability if we do not condition on tenants living in a WEG building at the time of the move but rather look at the moving history of all tenants who ever lived in a WEG dwelling. This is closer to a lifetime relocation probability profile of an individual, whereas the estimation in Figure 10 is based on a changing set of tenants. The corresponding estimates are reported in Table 10 in the appendix. The effect is slightly cleaner. Once, the ZV1 subsidy expires the mobility rate increases by 1.2pp and then stabilizes at that level.

If we turn this panel event study into a Difference-in-Difference estimation to compare the evolution of residential mobility of WEG tenants to renters in the free market, we get the estimates plotted in Figure 18 in the appendix. We see that in the years during which the ZV1 subsidy is paid out the mobility rate of WEG tenants is significantly lower than for renters on the free market but then exceeds it in the post subsidy period. A simple pre versus post-period Difference-in-Difference

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<sup>33</sup>The relocation probability in  $t - 1$  is 12.67%.



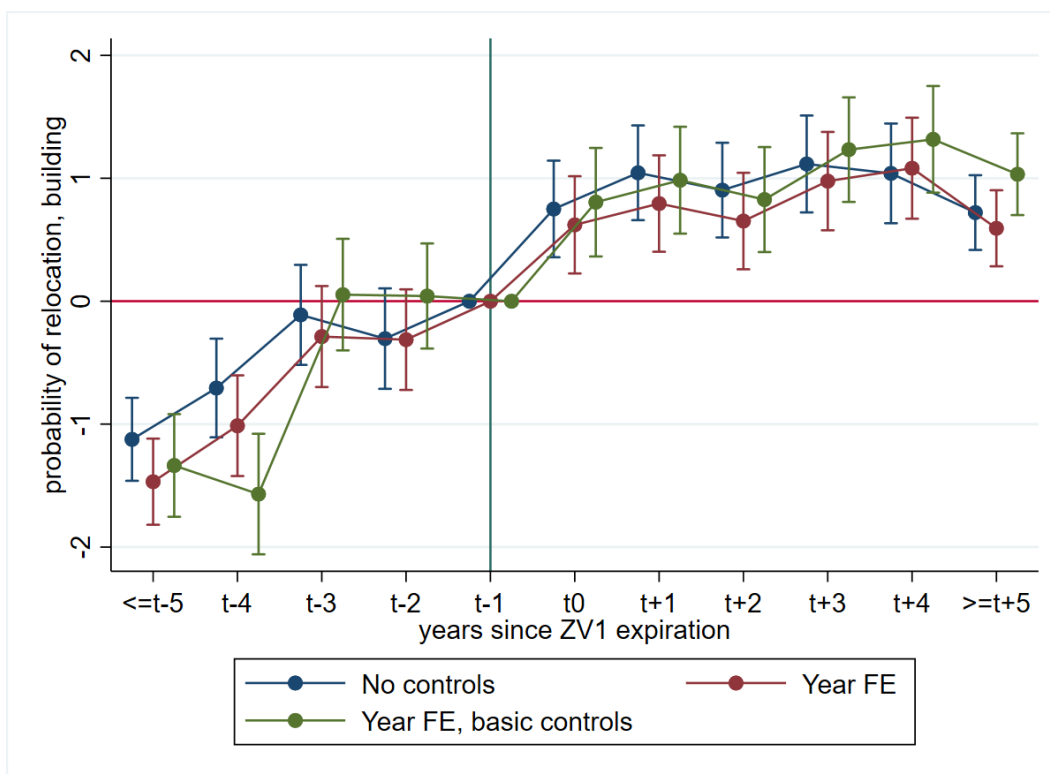


Figure 10: Moving out probability of tenants living in WEG building relative to year before ZV1 expiration  $t - 1$

	(1)	(2)	(3)
$t \leq -5$	-1.124*** (0.172)	-1.468*** (0.179)	-1.336*** (0.213)
$t - 4$	-0.706*** (0.205)	-1.013*** (0.209)	-1.569*** (0.250)
$t - 3$	-0.111 (0.208)	-0.287 (0.210)	0.053 (0.231)
$t - 2$	-0.304 (0.209)	-0.313 (0.209)	0.042 (0.218)
$t0$	0.750*** (0.200)	0.621*** (0.202)	0.806*** (0.225)
$t + 1$	1.045*** (0.197)	0.795*** (0.200)	0.984*** (0.222)
$t + 2$	0.904*** (0.197)	0.652*** (0.200)	0.827*** (0.218)
$t + 3$	1.117*** (0.201)	0.977*** (0.204)	1.233*** (0.217)
$t + 4$	1.040*** (0.207)	1.082*** (0.210)	1.317*** (0.221)
$\geq t + 5$	0.721*** (0.155)	0.593*** (0.158)	1.033*** (0.170)
male			0.524*** (0.080)
CH citizen			-0.805*** (0.087)
married			-1.438*** (0.108)
divorced			3.610*** (0.204)
age			-0.079*** (0.008)
age <sup>2</sup>			-0.001*** (0.000)
HH size			0.388*** (0.044)
N old children			-4.332*** (0.085)
constant	12.672*** (0.144)	13.201*** (0.160)	19.183*** (0.285)
year FE's?	No	Yes	Yes
# observations	1000823	1000823	793,502
# regressors	10	17	26
Adjusted R <sup>2</sup>	0.000	0.001	0.011
Mean	13.060	13.060	12.957
Standard deviation	33.696	33.696	33.583

Notes: Robust standard errors in parantheses

\*\*\*, \*\*, \* denote statistical significance on the 1%, 5%, and 10% level, respectively.

Table 4: Moving out probability of tenants living in WEG building relative to year before ZV1 expiration  $t - 1$

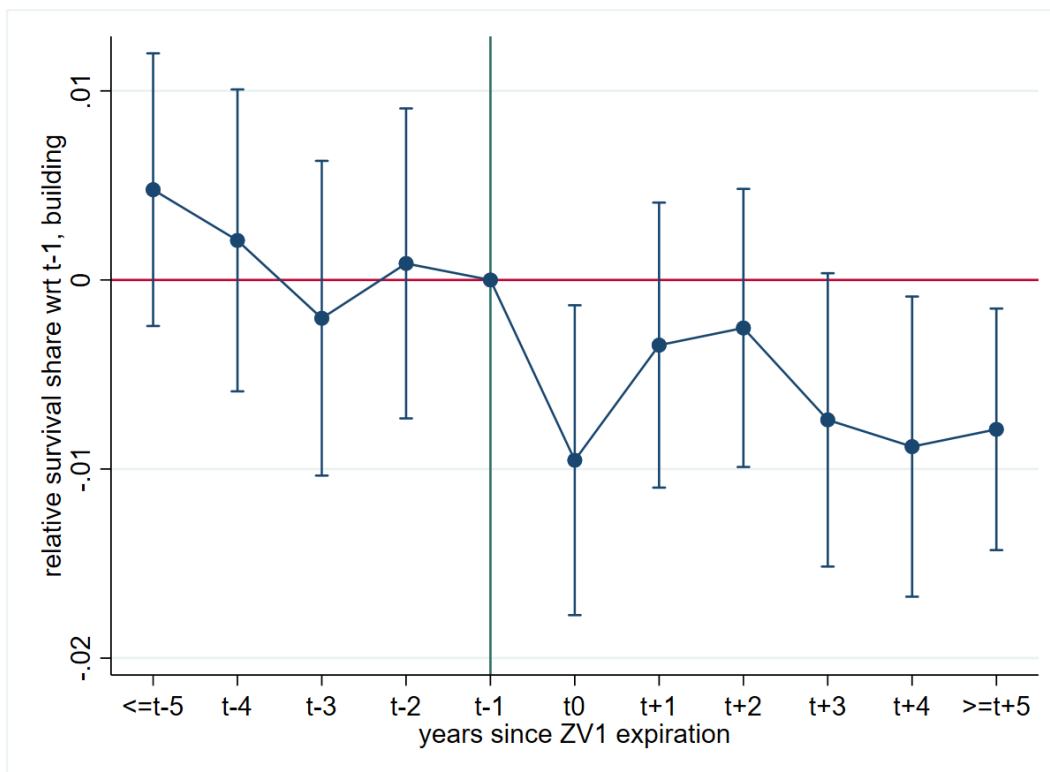


Figure 11: Previous-year tenant survival rate of WEG buildings relative to year before ZV1 expiration  $t - 1$

estimation yields that in the pre-period the mobility in WEG is 0.8pp (5.9%) lower and in the post period 0.41pp (3.0%) higher than for renters on the free market.

The second approach is to look at out-moves on the WEG building level. For this we compare the share of tenants still living in the WEG building compared to the set of tenants of that building in the previous year. In other words, the period survival rate – the flip side of the hazard rate. Again using a panel event study we align buildings’ moving histories around the ZV1 subsidy expiration year. The estimation equation is the same as stated in Equation 1, except that  $s$  is now a building rather than an individual. The estimates of these previous-year surviving probabilities relative to the magnitude in year  $t - 1$  are plotted in Figure 11. We see that in  $t0$  – on impact of the subsidy expiration – the survival rate drops by 1pp and remains negative in the following years. Hence, the largest additional turnover is induced by the expiration of the subsidy but also in the following period turnover (the survival share) remains higher (lower) than during the subsidy period. The cumulative value of the post coefficients quantifying the reduction in survival probability is -3.97%. The F statistic of 4.68 (p-value 0.0305) confirms the significance of the effect. Also note that on average only 34% of households in a dwelling receive ZV1 subsidies. Hence, the treatment of subsidy expiration applies only to a subset of households in the building. The effect on treated households is therefore up to three times higher than the estimated coefficients.

Alternatively, we can compare the share of tenants still living in the WEG building compared

to the set of tenants in the year before the expiration of the ZV1 subsidy,  $t - 1$ . Figure 19 in the appendix depicts the estimates of this cumulative survival rate. In the year of subsidy expiration  $t_0$  only 86.5% of the  $t - 1$  tenants remain. 4 years after expiration this has decreased to 55.8%. Comparing the survival rates pre expiration to those post expiration, we see that while there is also turnover in the pre-period, the survival share at any time horizon is lower in the post period. At the 1 year horizon the post survival share is 1.51pp lower, at 2 years 1.92pp and at 3 years 2.11pp. This is the inverse of an accumulated mobility rate difference.

Rather than just looking at how residential mobility responds to subsidy expiration over all building cohorts, we can specifically look at the cohorts affected by the 2014 subsidy extension reform introduced in Section 5.3. Figure 12 plots the probability of relocating to a different building in the following year for tenants of buildings that entered the WEG program in 1993, 1994 and 1995. For tenants in the 1993 building entry cohort, ZV1 subsidies expired after 19 years. We see that their mobility is already high in year 18 and 19, consistent with moves related to subsidy expiration.<sup>34</sup> Tenants in the 1994 cohort also expected their ZV1 subsidy to expire after 19 years. As they learn that they are awarded an extra year of subsidy in year 21, their move-out rate plunges in year 20, consistent with not wanting to miss the additional year of subsidy. In year 21 and 22, their mobility rate picks up again. Also tenants in the 1995 cohort expected their ZV1 subsidy to expire after 19 years. As they learn that they are awarded 2 extra years of ZV1 subsidy, their move-out rate also plunges in year 20, consistent with not wanting to miss the additional 2 years of subsidy. In the years 21 and 22, their mobility rate picks up again in line with expiration induced mobility. The mobility rate reaches its peak at 25 years when the dwellings are exiting the WEG program and are subject to general Swiss tenancy law. This transition typically implied another rent increase away from cost rent towards a customary market rent. To quantify the effects of an additional year of ZV1 subsidy we can apply the strategy described in 5.3.

We conclude that while tenants in WEG subsidized dwellings have low residential mobility, subsidy expiration increases mobility substantially. This suggest the lock-in effect to be an important channel to explain the low residential mobility of tenants of subsidized housing. Awareness of the difficulty of finding another affordable dwelling induces households to remain in the same dwelling for an extended period of time. The rent increase due to subsidy expiration reduces the attractiveness of WEG dwellings and triggers move-outs. However, it could also be that the rent increase at expiration puts tenants in serious financial distress and they have to relocate in order to reduce their housing expenditure. The next section sheds light on this issue by analyzing where WEG tenants whose move-out timing coincides with subsidy expiration move to.

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<sup>34</sup>There is another mayor move out wave around year 25. That is when the ZV2 subsidy expires and the building exits the WEG program.

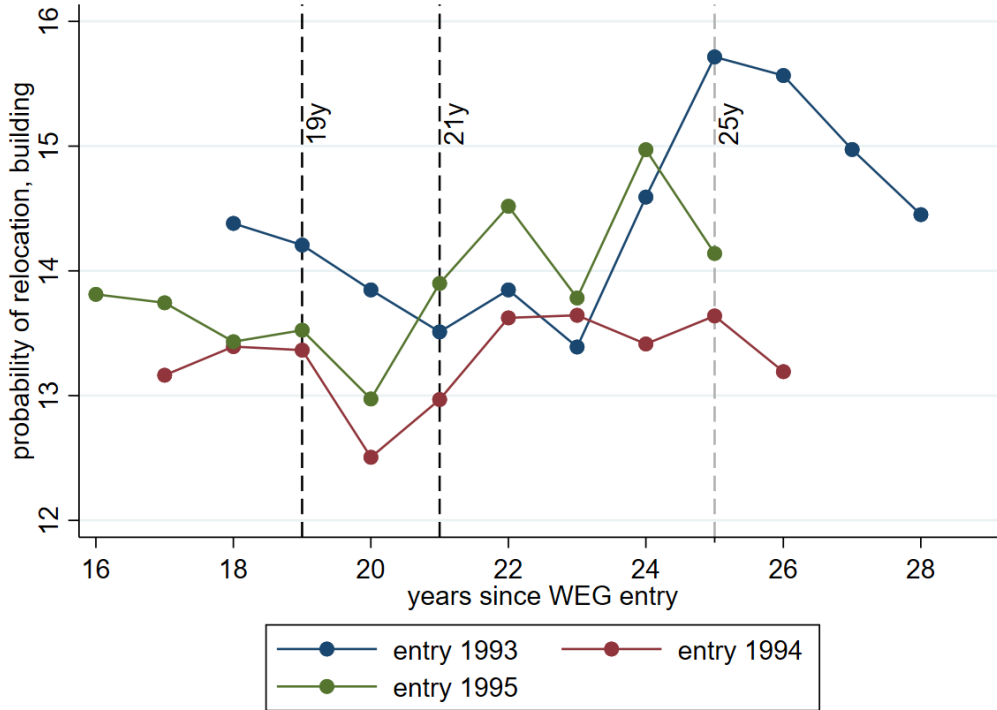


Figure 12: Tenant relocation probability for different building entry cohorts

## 6.2 Dwelling and neighborhood changes at WEG in- and out-moves

A key argument for the provision of housing subsidies is that it allows recipients to live in a quality of housing and at locations they could otherwise not afford. To shed light on the opportunities that WEG dwellings provide, it is informative to look at the change in dwelling and neighborhood characteristics associated with the moves into and out of WEG buildings. Does the WEG program provide access to better dwellings in better neighborhoods than the tenants are coming from? Does WEG housing provide a springboard to move to a better dwelling in a better neighborhood in the future? Or does the expiration of ZV1 subsidies put tenants in such financial distress that they are forced to move to worse dwellings in worse neighborhoods?

Table 5 reports the change in dwelling and neighborhood characteristics experienced by tenants moving *into* WEG buildings. We distinguish between tenants moving into a WEG building that is still ZV1-eligible for at least 3 years,  $s \leq t - 3$ , labeled *ZV1 active*, and tenants moving into buildings where ZV1 had already expired before they moved in,  $s > t_0$ , labeled *ZV1 expired*. As a comparison group, column (1) provides the dwelling and neighborhood characteristic changes for renters on the free market. We restrict the sample to individuals aged 30 to 55 and living in a household with at most 9 members. We assess dwelling and neighborhood quality using indicators based on GWS and SE data from 2010-2019, as introduced in Section 3. In terms of dwelling characteristics, we observe the dwelling's surface, the number of rooms and whether the dwelling has a non-profit purpose. In

terms of neighborhood characteristics, we observe the share of the population with tertiary education, the high socioeconomic status share, the Swiss citizens share, the mean age of the population, the unemployment and employment rate, the share of home owners and the mean monthly net rent per m<sup>2</sup>. Most importantly, we have calculated neighborhoods’ median yearly household income based on social security data.

The size of the standard errors indicates that there is a lot of variation in dwelling and neighborhood characteristics. Moving into a WEG building can imply an improvement but also a deterioration of dwelling and neighborhood quality. In terms of tertiary education share, for example, the 10th percentile experiences a decline of -4.71pp, whereas the 90th percentile experiences an increase of 3.72pp from a base level of 14.95%.<sup>35</sup> On average, WEG in-movers – columns (2) and (3) – experience a slight deterioration of neighborhood quality with the indicators on tertiary education share, high socioeconomic share, employment rate and rental price being negative. Dwelling quality remains essentially unchanged. Remarkable is that 46.3% of tenants that move into a ZV1-active WEG dwelling had previously already lived in a non-profit dwelling.<sup>36</sup> This high attachment to subsidized housing suggest there could be some sort of insider advantage and should be investigated further. For tenants moving into ZV1-active WEG buildings, neighborhood median household income declines by CHF 773 (-1.07%), whereas for tenants moving into ZV1-expired WEG buildings it increases by CHF 457 (+0.63%). For both groups this is significantly worse than the average neighborhood income increase of CHF 794 (+1.07%) a free market renter experiences when relocating.

For 27.9% of ZV1-active WEG in-movers the relocation implied an increase in neighborhood income, for 30.3% a reduction and 41.8% already lived in the same neighborhood. Hence, for the majority of tenants WEG is not providing access to better neighborhoods, but it does for some. This reflects the fact that WEG buildings are well spread over all neighborhoods in Switzerland.

Table 6 reports the change in dwelling and neighborhood characteristics experienced by tenants moving *out of* WEG buildings. We distinguish between tenants moving out of WEG dwellings whose ZV1 duration expiration coincides with the timing of their move,  $s \in [t - 1, t + 2]$ , labeled *ZV1 expiring*, and tenants moving out of WEG dwellings whose ZV1 duration would still be active for at least 3 years,  $s \leq t - 3$ , labeled *ZV1 active*. Again there is substantial variation. Moving out of a WEG building can imply an improvement but also a deterioration of dwelling and neighborhood quality. In terms of tertiary education share, for example, the 10th percentile experiences a decline of 4.04pp whereas the 90th percentile experiences an increase of 4.36pp from a base level of 14.63%.<sup>37</sup> On average, WEG out-movers (columns 2 and 3) experience an improvement of dwelling and neighborhood quality with the indicators on dwelling surface, N rooms, tertiary education share, high socioeconomic share, Swiss citizen share, employment rate, home owner share and most importantly neighborhood income being positive. Hence, we do not find evidence that WEG expiration

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<sup>35</sup>See Table 11 in the appendix for the distribution of other indicators.

<sup>36</sup>Note that during the WEG stay the non-profit share is 100% as the WEG program imposes cost-rent and potentially pays subsidies on top. For tenants moving into a ZV1-expired WEG dwelling the pre non-profit share before share is 39.6%. The average country-wide non-profit dwelling share in the period 2010-2020 was 3.91%.

<sup>37</sup>See Table 12 in the appendix for the distribution of the change in the other indicators.

	(1)	(2)	(3)	(4)	(5)	(6)
	(R) Renter free market	(A) ZV1 active	(B) ZV1 expired	(A)-(B)	(A)-(R)	(B)-(R)
<b>Dwelling</b>						
Living surface, m2	0.35 (53.92)	0.21 (43.15)	-0.33 (43.93)	1.54* (0.80)	-0.14 (0.94)	-0.68 (0.40)
N rooms	-0.02 (1.75)	0.05 (1.54)	-0.02 (1.55)	0.07** (0.03)	0.07** (0.03)	0.00 (0.01)
Non-profit share, %	0.00 (0.00)	53.49 (49.88)	60.39 (48.91)	-6.90*** (0.73)	53.49*** (0.20)	60.39*** (0.19)
<b>Neighborhood</b>						
Median HH income	794.48 (15,537.04)	-773.33 (13,195.06)	456.58 (12,553.78)	-1,229.91*** (194.03)	-1,567.81*** (223.28)	-337.90*** (109.78)
Tertiary educ share, %	0.02 (4.64)	-0.30 (4.29)	-0.26 (3.91)	-0.04 (0.06)	-0.32*** (0.07)	-0.28*** (0.03)
High socioecon share, %	0.08 (4.13)	-0.35 (3.60)	-0.21 (3.37)	-0.14*** (0.05)	-0.43*** (0.06)	-0.29*** (0.03)
CH citizen share, %	0.36 (9.48)	0.27 (8.71)	0.17 (9.06)	0.11 (0.14)	-0.09 (0.14)	-0.19*** (0.07)
Mean age	0.01 (2.47)	0.06 (2.36)	-0.15 (2.20)	0.21*** (0.03)	0.05 (0.04)	-0.16*** (0.02)
Population, k	-0.01 (8.44)	0.22 (7.35)	0.38 (8.11)	-0.16 (0.12)	0.23* (0.12)	0.39*** (0.06)
Unemployment rate, %	-0.08 (2.00)	0.05 (1.83)	0.01 (1.86)	0.04 (0.03)	0.13*** (0.03)	0.09*** (0.01)
Employment rate, %	0.02 (4.50)	-0.32 (4.14)	0.05 (4.13)	-0.36*** (0.06)	-0.34*** (0.06)	0.03 (0.03)
Home owner share, %	0.82 (17.39)	0.11 (14.71)	-0.05 (15.07)	0.16 (0.23)	-0.70*** (0.25)	-0.87*** (0.12)
Mean rent per m2	-0.04 (2.14)	-0.20 (1.85)	-0.16 (1.77)	-0.04 (0.03)	-0.16*** (0.03)	-0.12*** (0.02)
Observations	65,458	5,422	26,054	31,476	70,880	91,512

Notes: Robust standard errors in parantheses.

\*\*\*, \*\*, \* denote statistical significance on the 1%, 5%, and 10% level, respectively.

Table 5: Changes in dwelling and neighborhood characteristics at moving into WEG

on average puts tenants in such financial distress that they have to move to a smaller dwelling or a cheaper neighborhood. In fact, ZV1 expiring WEG out-movers on average move to a dwelling that is 14.3 m<sup>2</sup> larger and has 0.33 rooms more. For tenants moving out of ZV1-expiring WEG buildings, neighborhood income increases by CHF 792 (+1.09%), whereas for tenants moving out before ZV1 expires it increases by CHF 2,098 (+2.95%). The increase for ZV1-active movers is even higher than the CHF 1,670 (+2.25%) for free-market renters. This indicates some catch up, but in terms of levels, ZV1-active movers next neighborhood income remains CHF 2,712 (3.56) below the one of free-market renters. We find that early movers are more likely to move to a better neighborhood than movers around expiration. The neighborhood income increase for early movers is CHF 1,307 higher and the share moving to a richer neighborhood is 4.8pp higher than for around expiration movers. Hence, early movers are positively selected. Moreover, early movers are also 4.2pp (62.7%) more likely to move into another non-profit dwelling, while for expiration movers the share is only 6.7%.<sup>38</sup> This low number for expiration movers is remarkable when we recall that at move-in as many as 46.3% came from another non-profit dwelling. Taken on its own this could raise concerns that WEG expiration movers fare much worse after subsidy expiration. However, for 30.2% of ZV1-expiring WEG out-movers the relocation implied an increase in neighborhood income, for 27.1% a reduction and 42.7% remain in the same neighborhood. For ZV1-active WEG out-movers the respective shares are 35.0%, 26.9% and 38.1%.<sup>39</sup> Even though for the majority of tenants the WEG is not providing a springboard to a better future neighborhood, for some tenants it does, especially among the early movers. And even if neighborhood quality fails to improve, many tenants experience an increase in dwelling size as they move out of WEG which can also be considered an improvement. This further alleviates the concern that due to the low non-profit share at out-moves tenants are faring much worse after expiration.

### 6.3 Effect of subsidies expiration on labor market outcomes

It is to be expected that the lock-in effect in combination with an income effect affects labor supply decisions of subsidized households. In this section, we analyze the effect of subsidy expiration on household income, labor force participation and job-mobility decisions. The results in this section are preliminary and will serve as a basis for further analysis.

We first compare WEG residents to the rest of the population in an event study design framework. In Section 5.1, we have shown that residents are somewhat aware of the remaining subsidy duration. This creates two complications for the analysis. First, the value of staying in the WEG dwelling decreases with remaining subsidy duration. This implies that people may decide to leave in the years leading up to the expiration. Second, as we have shown in Section 5.1 these people are replaced by

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<sup>38</sup>For free-market renters the share moving into non-profit is 2.75%. Restricting to households with an income below the median income of WEG tenants increases this share to 3.62% but remains clearly below the shares for WEG tenants.

<sup>39</sup>Conditional on leaving neighborhood this implies a 52.7% probability of moving to a richer one for ZV1 expiring movers and 56.5% for ZV1 active movers. The distribution of changes in neighborhood median household income is depicted in Figure 20 in the Appendix.



	(1)	(2)	(3)	(4)	(5)	(6)
	(R) Renter free market	(A) ZV1 expiring	(B) ZV1 active	(A)-(B)	(A)-(R)	(B)-(R)
<b>Dwelling</b>						
Living surface, m2	16.09 (51.55)	14.27 (45.50)	13.21 (45.50)	1.06 (0.78)	-1.82*** (0.59)	-2.88*** (0.70)
N rooms	0.44 (1.61)	0.33 (1.50)	0.31 (1.55)	0.03 (0.03)	-0.11*** (0.02)	-0.14*** (0.02)
Non-profit share, %	2.75 (16.37)	-93.30 (25.00)	-89.11 (31.16)	-4.20*** (0.47)	-96.06*** (0.21)	-91.86*** (0.25)
<b>Neighborhood</b>						
Median HH income	1,670.20 (15,480.71)	791.55 (13,192.45)	2,098.78 (14,363.71)	-1,307.23*** (233.71)	-878.66*** (177.10)	428.58** (212.69)
Tertiary educ share, %	-0.24 (4.51)	0.19 (3.58)	0.10 (4.34)	0.09 (0.07)	0.43*** (0.05)	0.34*** (0.06)
High socioecon share, %	0.13 (4.05)	0.31 (3.34)	0.46 (3.66)	-0.14** (0.06)	0.18*** (0.05)	0.33*** (0.06)
CH citizen share, %	1.38 (9.23)	0.72 (8.79)	1.21 (8.93)	-0.49*** (0.15)	-0.65*** (0.11)	-0.17 (0.13)
Mean age	0.00 (2.40)	0.12 (2.14)	0.06 (2.45)	0.06 (0.04)	0.12*** (0.03)	0.06* (0.03)
Population, k	-0.63 (8.40)	-0.51 (8.48)	-0.90 (7.84)	0.38*** (0.14)	0.12 (0.10)	-0.27** (0.12)
Unemployment rate, %	-0.23 (2.00)	-0.17 (1.86)	-0.30 (2.00)	0.13*** (0.03)	0.05** (0.02)	-0.07*** (0.03)
Employment rate, %	0.05 (4.44)	0.10 (3.99)	0.27 (4.36)	-0.16** (0.07)	0.05 (0.05)	0.21*** (0.06)
Home owner share, %	3.51 (17.06)	1.75 (15.68)	3.46 (16.43)	-1.71*** (0.27)	-1.76*** (0.20)	-0.04 (0.23)
Mean rent per m2	-0.22 (2.04)	0.03 (1.65)	-0.04 (1.92)	0.06** (0.03)	0.25*** (0.02)	0.18*** (0.03)
Observations	58,980	8,684	6,061	14,745	67,664	65,041

Notes: Robust standard errors in parantheses.

\*\*\*, \*\*, \* denote statistical significance on the 1%, 5%, and 10% level, respectively.

Table 6: Changes in dwelling and neighborhood characteristics at moving out of WEG

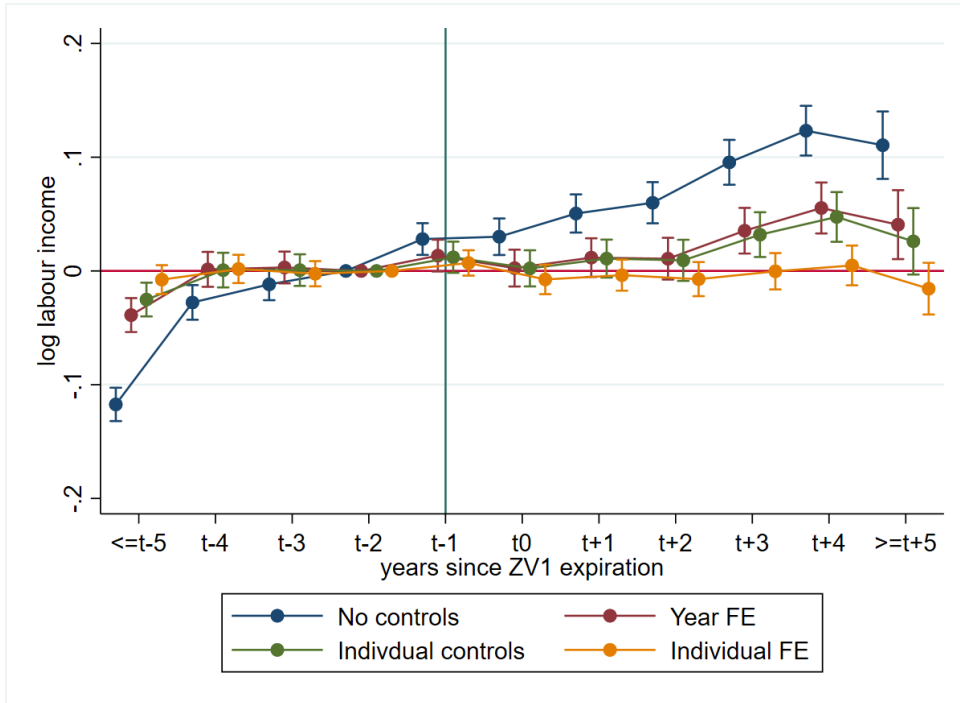


Figure 13: Labor income compared to  $t - 2$

a different type of resident. As the focus of this study is not on tenants that enter shortly before subsidies expire, we will focus on tenants living in WEG dwellings 2 years prior to benefit expiration. However, our results also hold for tenants living in WEG buildings 3 or 4 years prior to subsidy expiration. In that way we capture the effect of anticipating subsidy expiration. However, we argue that, while anticipated, the expiration timing is largely orthogonal to individual characteristics when conditioning on individuals that moved in sufficiently early.

Figure 13 plots WEG tenants' labor income growth relative to  $t - 2$  around the time of ZV1 subsidy expiration. We observe that there is no pre-trend, once we condition on basic controls, supporting our orthogonality claim. Our preferred specification – including individual fixed effects, year fixed effects and dummies for age – does not show any effect on the logarithm of yearly income. The distribution of yearly income is heavily skewed which justifies the use of logarithm. However, the logarithm of 0 is not defined which implies that we are looking at income *conditional* on working. Income conditional on working can either change because people who are already working earn more/less (intensive margin) or because people start/stop working (extensive margin). We will now investigate the latter.

In Figure 14, we observe that labor force participation decreases after subsidy expiration. Again there is no pre-trend, reinforcing our argument that expiration is orthogonal to individual characteristics conditional on basic observables. Two years after ZV1 subsidy expiration labor force participation is 4pp lower than during the subsidy period. The decline in labor force participation is striking as it goes against the mechanisms that we suspected to be at play. At this point in the

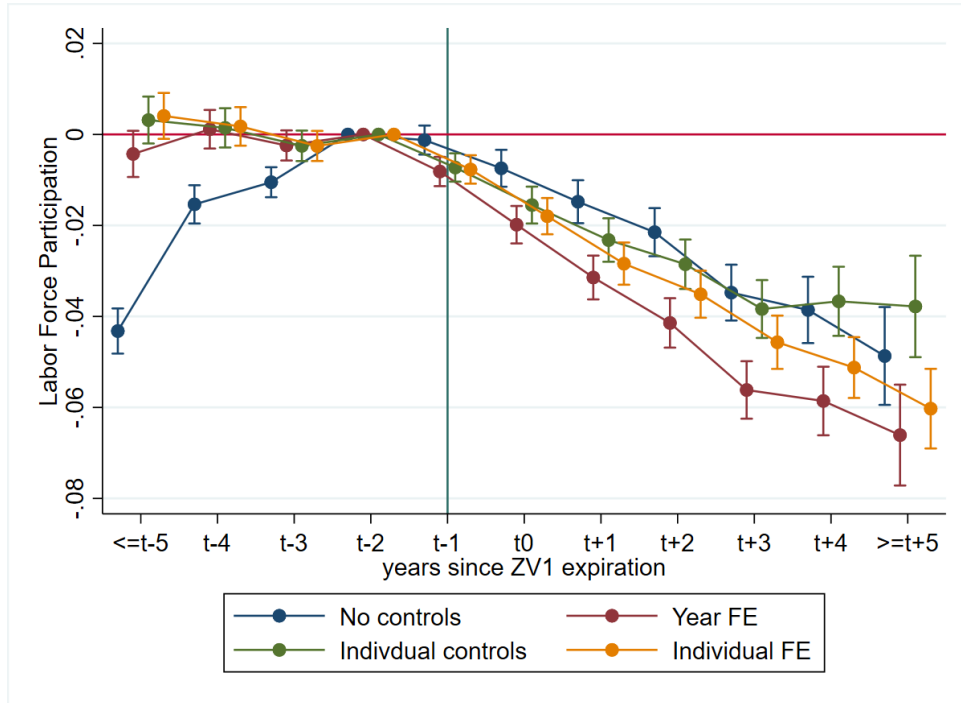


Figure 14: Labor force participation relative to  $t - 2$

analysis, we can only conjecture possible reasons. One could imagine that some residents are forced out of local labor markets with good job opportunities or that substitution with other welfare programs overcompensates the subsidy loss. The finding is robust to splitting the sample between age groups and gender (see Figure 21 in the appendix). However, men seem to be more affected than women, especially young men. Including zero incomes as arbitrarily small numbers such that the logarithm is defined or applying the IHS transformation as suggested by Aihounton and Henningsen (2021) does not change the results either (see Figures 22 and 23 in the appendix)<sup>40</sup>. However, it is important to mention that with both transformations the magnitude of the effect is highly sensitive to the exact specification chosen.

Similarly, Figure 15 plots the job-to-job transition probability. That is the probability that someone who was employed in the previous year is employed at a different employer in the current year. Being employed is defined as having reported annual earnings of more than CHF 5,000 at one employer. Also this analysis shows a zero effect. Hence, WEG tenants are not more likely to switch employer once ZV1 subsidies expire.

Combining the findings on labor income, labor force participation and job mobility suggests that, while most tenants stay in their current job, earning the same salary, some tenants drop out of the labor force after ZV1 subsidy expiration. The drop in labor force participation is puzzling and has to be investigated further.

<sup>40</sup>The inverse hyperbolic sine (IHS) transformation amounts to taking the arcsin of the desired variable. However, the result depends on the scale of the original variable

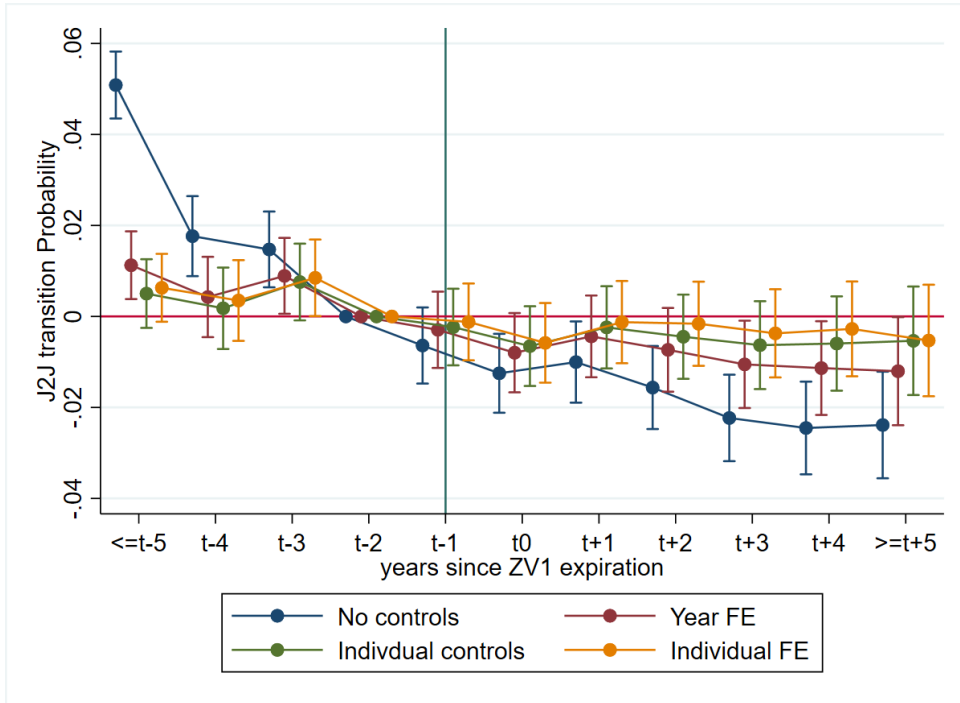


Figure 15: Job-to-job transitions relative to  $t - 2$

## 6.4 Further Analysis

The current version of this paper only contains a first set of explorative results. The data linkage across population register, social security, unemployment insurance, social aid and educational enrollment provides the opportunity for a wealth of further analysis. In this section, we briefly outline our road map for future work.

First, we aim to dig deeper into understanding the experience of tenants at the time of subsidy expiration. We have documented that at subsidy expiration tenants' moving out probability significantly increases and neighborhood quality slightly increases but found no effect on their household income growth. As the expiration of the ZV1 subsidy on average implies a rent increase of about 10%, the question is how households cope with this shock. There are different possible margins of adjustment. Affected households can either increase household income by increasing the number of hours worked or switching to a better paying job. This does not seem to be happening. We find a zero effect for labor income and labor force participation is even decreasing. They can reduce rent expenditure by moving to a cheaper dwelling. As shown in Section 6.2, this channel is used by around a third of tenants. Alternatively, they could save on other household expenses in order to be able to afford the higher rent. As we do not have household expenditure data, we can unfortunately not observe this channel. Finally, they can substitute the loss of ZV1 subsidies by taking up other forms of social assistance. Our data allows to investigate the relevance of this channel as we observe the individual payouts of social assistance.

Second, we aim to exploit the 2014 ZV1 subsidy duration reform to get at a clean causal effect of

an additional year of housing subsidies on residential mobility, job mobility and household income. Even though, the treatment strength is only moderate, we are optimistic to be able to identify effects thanks to the high number of observations left and right of the building entry year threshold (see Figure 1).

Finally, a complementary outcome of interest we can study with our data is the educational attainment and labor market outcomes of *children* of subsidy recipients. Relating to the literature on neighborhood effects, which shows that exposure to a high quality neighborhood can be beneficial for job opportunities and education (see for example Chetty et al., 2016), we aim to leverage variation in residential relocation timing to look at children’s outcomes. The idea is to use the subsidy duration reforms as instruments for households’ relocation timing. We have shown in Section 6.1 that subsidy expiration abruptly increase moving probability. There is variation in the timing of subsidy expiration both across time and across the age of children. The reforms provide an extension of subsidy duration which should induce some households to postpone their move. In other words the reforms provide exogenous variation in subsidy expiration timing and hence in relocation timing and neighborhood exposure duration. We have shown in Section 6.2 that some ZV1 expiring WEG out-movers relocate to a worse neighborhood, which allows them to reduce their rental spending. Given that in Switzerland residential location is decisive for school assignment in primary and secondary school and school quality is dependent on peer composition, relocation implies a change in school quality. Hence, the reforms provide exogenous variation in schooling quality exposure time. A nice feature of our data is that thanks to class room identifiers, we can observe the direct peers a student is exposed to. Leveraging the population registry, we can identify their parents and based on the income in the social security data identify their socioeconomic status. We aim at estimating the effect of school peer quality and other neighborhood characteristics on the highest degree achieved and future earnings of children of WEG recipients. Moreover, it will be interesting to look for potential *disruption effects*, as the timing of relocation itself may matter for a child’s scholastic achievements. If residential relocation coincides with a natural schooling transition, for example, when the child would have transitioned from elementary to secondary school anyway, the disruption is likely to be less costly than when relocation occurs in the middle of a schooling level. The success probability of this analysis depends on two factors. First, subsidy expiration needs to have a sufficiently strong effect on relocation probability in order for our instrument to be relevant. Second, relocation neighborhoods must be sufficiently different in order for the treatment to be strong enough to make a statement about the presence or absence of peer effects.

## 7 Conclusion

We analyzed the effects of a large-scale, object-targeting housing assistance program in Switzerland. The WEG program offered rent subsidies to low-income households for a limited duration. Our paper helps to better understand the unintended consequences of such housing assistance, focusing

on residential mobility and labor market outcomes. We show that WEG dwellings are geographically well dispersed and cover the entire range of Swiss neighborhoods, providing access to high-quality neighborhoods with attractive employment opportunities. We find that the subsidies for low-income households have a negative effect on recipients' residential mobility. Using the fact that subsidy duration is tied to the program entry date of the building, we perform event studies of recipients' behavior around the time of subsidy expiration to observe how they cope with the cease of subsidies. At subsidy expiration, recipients are confronted with a substantial rent increase. We show that once the subsidy duration is exhausted, the mobility rate of WEG tenants increases substantially. These findings suggest the lock-in effect due to excess demand for affordable housing to be an important channel to explain the low residential mobility of tenants of subsidized housing. Furthermore, we find that WEG out-movers on average experience an improvement of dwelling and neighborhood quality, but there is large variation in outcomes. For many tenants the WEG program does provide a springboard to a better future neighborhood, especially for those moving before subsidies are exhausted, but that is not the case for all tenants. Interestingly, we find a high attachment of WEG tenants to subsidized housing at move-in but not at move-out. Finally, we do not find any effect of subsidy expiration on labor income and job mobility but a negative effect on labor force participation. Hence, while most WEG tenants stay in their current job, earning the same salary, some tenants drop out of the labor force. This is striking as it goes against the mechanisms that we suspected to be at play and needs to be investigated further. The results on household income, labor force participation and job mobility are preliminary and will serve as a basis for further analysis. We hope that our study can contribute to a more informed debate of housing policy interventions.

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# Appendix



Source: Wohnbaugenossenschaften Zürich (Karte der gemeinnützigen Wohnbauträger)



Source: Google Street View

Figure 16: WEG housing estate *Am Wasser* in Zurich

	Obs	p25	Median	p75	Mean	SD
<b>Demographics</b>						
Population, k	982	4.54	8.43	15.95	11.49	9.19
Pop density, k per km2	972	0.45	1.03	2.92	2.45	3.58
Tertiary educ share	982	12.02	13.87	17.08	14.86	4.20
High socioecon share	982	17.39	19.48	21.94	19.80	3.58
Unemployment rate	982	3.82	5.01	7.67	5.76	2.68
Employment rate	982	58.78	62.12	64.55	61.75	4.77
Female employment rate	982	27.33	28.73	30.05	28.71	2.29
Retiree share	982	18.50	20.81	23.50	21.03	3.80
Schooling-age children share	982	24.34	26.74	29.93	26.86	4.87
Total residential mobility rate	982	5.24	6.13	7.00	6.19	1.40
CH citizen share	982	60.46	67.72	74.84	67.54	10.06
Age	982	39.28	40.77	42.45	40.85	2.31
<b>Housing</b>						
N WEG dwellings	982	55.00	127.00	256.00	194.14	191.13
Single family home share	982	11.10	23.51	36.01	24.54	16.25
Home owner share	982	20.76	37.65	50.36	36.03	17.95
Built post 2010 share	982	3.13	4.91	7.17	5.43	3.11
Rent per m2	982	14.33	15.81	17.81	16.14	2.55
Overoccupation share	982	6.71	9.39	12.71	10.30	4.90
Surface per person	982	41.11	45.07	48.11	44.50	5.41

Notes: Statistics are weighted by the number of WEG dwellings per neighborhood.

Table 7: Characteristics of WEG neighborhoods

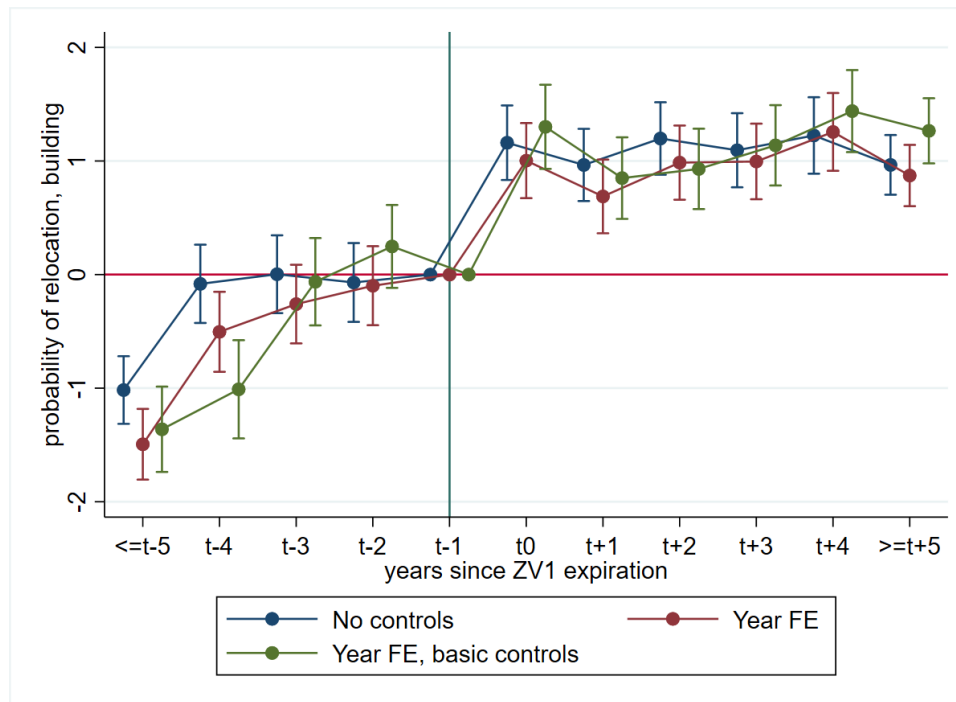


Figure 17: Moving probability of tenants ever lived in WEG building

	WEG	nonWEG	WEG-nonWEG	N
Population, k	11.56 (8.83)	4.11 (4.55)	7.45 (0.65)***	2891
Pop density, k per km2	2.39 (3.81)	1.39 (3.04)	1.00 (0.30)***	2411
Tertiary educ share	15.66 (4.49)	15.13 (5.13)	0.53 (0.30)*	2891
High socioecon share	20.63 (3.70)	22.28 (4.42)	-1.65 (0.24)***	2570
Unemployment rate	5.23 (2.49)	4.28 (2.69)	0.95 (0.17)***	2887
Employment rate	62.21 (4.43)	61.95 (6.23)	0.26 (0.30)	2891
Female employment rate	28.91 (2.20)	28.52 (3.48)	0.39 (0.15)**	2891
Retiree share	21.02 (3.65)	20.45 (4.75)	0.57 (0.21)**	2891
Schooling-age children share	26.38 (4.66)	28.25 (5.87)	-1.87 (0.26)***	2891
Total residential mobility rate	6.30 (1.34)	6.45 (2.48)	-0.15 (0.08)*	2889
CH citizen share	68.71 (10.07)	73.66 (10.50)	-4.94 (0.65)***	2891
Age	41.13 (2.20)	41.30 (2.97)	-0.17 (0.12)	2890
N WEG dwellings	121.33 (148.98)	0.00 (0.00)	121.33 (9.43)***	2900
Single family home share	25.84 (16.07)	39.66 (18.26)	-13.82 (1.06)***	2886
Home owner share	37.94 (17.75)	52.61 (17.39)	-14.67 (1.18)***	2891
Built post 2010 share	5.41 (3.09)	5.26 (4.05)	0.15 (0.19)	2886
Rent per m2	16.62 (2.70)	16.04 (3.23)	0.58 (0.18)***	2719
Overoccupation share	9.56 (4.53)	7.50 (4.20)	2.06 (0.29)***	2891
Surface per person	45.41 (5.31)	48.66 (6.04)	-3.25 (0.36)***	2767

Notes: Statistics are weighted by population per neighborhood.

Table 8: Characteristics of WEG and non-WEG neighborhoods

	Pre	Post1	Post2	Pre-Post1	N1	Pre-Post2	N2
<b>Building</b>							
N dwellings	18.32 (22.58)	14.89 (10.11)	19.81 (18.90)	-3.43 (3.06)	1517	1.49 (3.48)	1489
Building surface, m2	363.27 (311.29)	371.58 (208.26)	497.79 (489.86)	8.31 (39.29)	1442	134.52 (58.28)**	1425
N floors	4.96 (2.22)	4.84 (2.14)	5.28 (2.62)	-0.12 (0.26)	1519	0.32 (0.29)	1497
Construction year	1968.83 (26.15)	1979.62 (24.80)	1984.06 (19.40)	10.79 (1.56)***	1518	15.22 (1.41)***	1495
Single family home share	5.67 (23.13)	1.71 (12.97)	0.60 (7.75)	-3.96 (0.50)***	1508	-5.06 (0.48)***	1485
Purely residential building share	78.42 (41.16)	87.58 (33.00)	87.18 (33.45)	9.16 (3.42)**	1520	8.76 (3.66)**	1500
<b>Neighborhood</b>							
Pop density, k per km2	2.20 (2.70)	1.86 (2.76)	2.38 (3.05)	-0.34 (0.19)*	1519	0.18 (0.21)	1490
Employment rate	61.50 (5.41)	61.78 (4.50)	61.19 (4.86)	0.28 (0.44)	1520	-0.32 (0.46)	1500
Unemployment rate	5.68 (2.41)	5.62 (2.62)	6.14 (2.99)	-0.06 (0.23)	1520	0.46 (0.25)*	1500
Tertiary educ share	14.65 (4.22)	14.17 (4.30)	14.77 (3.92)	-0.48 (0.30)	1520	0.12 (0.30)	1500
High socioecon share	19.74 (3.16)	19.62 (3.77)	19.73 (4.04)	-0.12 (0.25)	1520	-0.01 (0.28)	1500
CH citizen share	68.40 (9.53)	67.23 (9.45)	67.10 (9.80)	-1.17 (0.71)	1520	-1.30 (0.77)*	1500
Home owner share	35.09 (18.01)	37.54 (17.29)	36.97 (17.55)	2.45 (1.28)*	1520	1.88 (1.32)	1500
Surface per person	44.53 (5.44)	44.33 (5.54)	44.71 (6.07)	-0.19 (0.41)	1520	0.19 (0.43)	1500
Rent per m2, CHF	15.91 (2.59)	16.18 (2.53)	16.16 (2.45)	0.27 (0.20)	1519	0.25 (0.20)	1499

Notes: Pre refers to the entry cohort 1993, Post1 and Post2 to the entry cohorts 1994 and 1995, respectively.

Table 9: Building and neighborhood characteristics of pre and post reform WEG entry cohorts

	(1)	(2)	(3)
$t \leq -5$	-1.017*** (0.152)	-1.494*** (0.159)	-1.362*** (0.192)
$t - 4$	-0.082 (0.176)	-0.504*** (0.180)	-1.010*** (0.221)
$t - 3$	0.003 (0.175)	-0.260 (0.177)	-0.063 (0.196)
$t - 2$	-0.070 (0.177)	-0.098 (0.178)	0.248 (0.186)
$t0$	1.161*** (0.167)	1.003*** (0.169)	1.301*** (0.189)
$t + 1$	0.965*** (0.162)	0.688*** (0.166)	0.849*** (0.183)
$t + 2$	1.198*** (0.163)	0.986*** (0.167)	0.930*** (0.180)
$t + 3$	1.095*** (0.166)	0.995*** (0.170)	1.138*** (0.180)
$t + 4$	1.225*** (0.172)	1.256*** (0.175)	1.439*** (0.184)
$\geq t + 5$	0.966*** (0.134)	0.872*** (0.138)	1.265*** (0.146)
CH citizen			-2.251*** (0.079)
married			-2.815*** (0.092)
divorced			3.796*** (0.195)
age			-0.013** (0.007)
age <sup>2</sup>			-0.002*** (0.000)
HH size			0.744*** (0.034)
male			0.167** (0.072)
N old children			-6.016*** (0.077)
constant	18.517*** (0.123)	19.238*** (0.137)	26.522*** (0.238)
year FE's?	No	Yes	Yes
# observations	1885712	1885712	1503889
# regressors	10	17	26
Adjusted R <sup>2</sup>	0.000	0.000	0.017
Mean	19.139	19.139	18.772
Standard deviation	39.340	39.340	39.049

Notes: Robust standard errors in parantheses

\*\*\*, \*\*, \* denote statistical significance on the 1%, 5%, and 10% level, respectively.

Table 10: Moving probability of tenants ever lived in WEG building

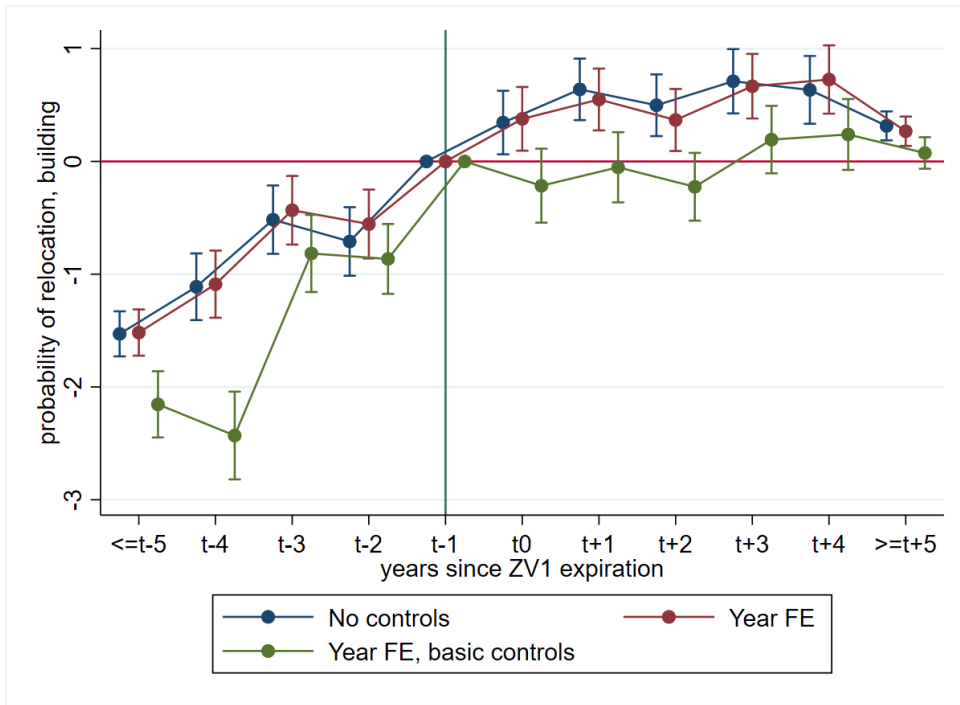


Figure 18: Moving probability of WEG tenants compared to free-market renters

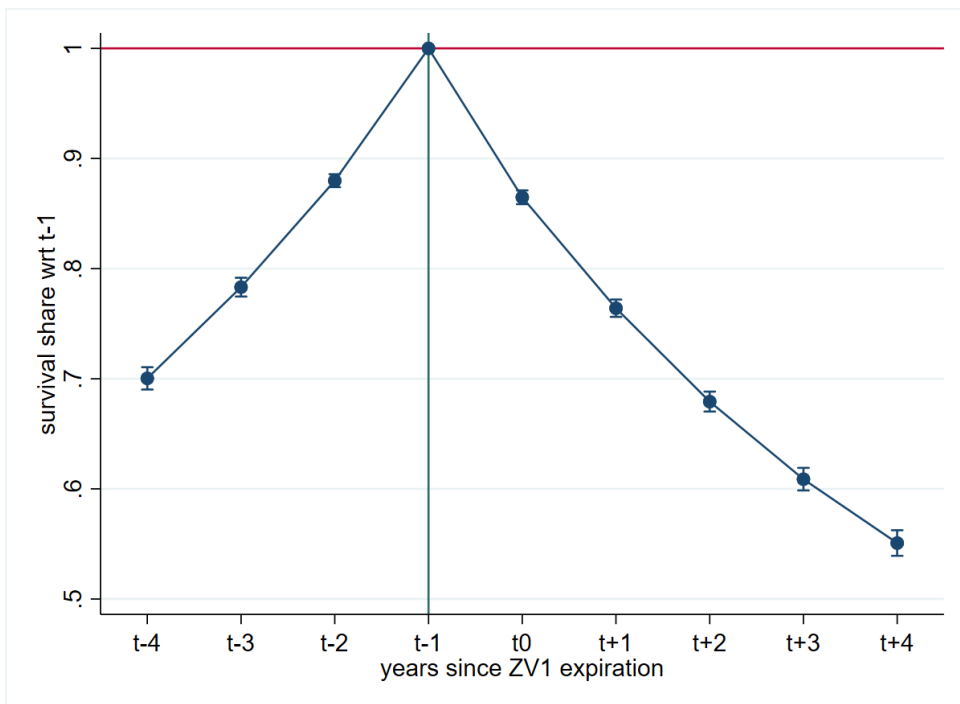


Figure 19: Cumulative tenant survival rate compared to  $t - 1$  for WEG buildings

	N	Mean	SD	p10	p25	p75	p90
Dwelling surface, m2	29,477	-1.11	43.87	-54.00	-21.00	26.00	44.00
N rooms of dwelling	29,477	-0.01	1.55	-2.00	-1.00	1.00	2.00
Non-profit dwelling	15,816	0.62	0.49	0.00	0.00	1.00	1.00
Median HH income	33,421	260	12,715	-14016	-1,700	2,858	15,064
Tertiary educ share, %	33,469	-0.27	3.96	-4.71	-1.00	0.33	3.72
High socioecon share, %	33,318	-0.22	3.41	-4.23	-0.91	0.30	3.54
CH citizen share, %	33,469	0.21	8.96	-10.14	-1.48	1.87	10.81
Mean age	33,469	-0.10	2.24	-2.69	-0.58	0.17	2.29
Population, k	33,469	0.34	7.94	-6.92	-0.50	1.26	8.21
Unemployment rate, %	33,469	0.01	1.85	-1.93	-0.29	0.35	2.02
Employment rate, %	33,469	-0.01	4.13	-4.62	-0.75	0.75	4.61
Home owner share, %	33,469	0.01	14.97	-17.62	-1.91	2.41	17.28
Mean rent per m2	33,362	-0.16	1.78	-2.12	-0.52	0.04	1.54

Table 11: Distribution of neighborhood characteristics change at moving into WEG

	N	Mean	SD	p10	p25	p75	p90
Dwelling surface, m2	32,718	12.97	44.83	-37.00	-15.00	35.00	65.00
N rooms of dwelling	32,718	0.31	1.51	-1.00	-1.00	1.00	2.00
Non-profit dwelling	33,102	-0.92	0.27	-1.00	-1.00	-1.00	-1.00
Median HH income	32,788	1,078	13,259	-13747	-1,381	4,444	16,921
Tertiary educ share, %	32,742	0.12	3.93	-4.04	-0.63	0.91	4.36
High socioecon share, %	32,669	0.38	3.49	-3.38	-0.26	1.28	4.53
CH citizen share, %	32,742	1.05	8.98	-8.85	-0.19	3.87	12.50
Mean age	32,742	0.16	2.21	-2.25	-0.21	0.74	2.76
Population, k	32,742	-0.67	8.13	-9.24	-2.01	0.20	6.50
Unemployment rate, %	32,742	-0.21	1.87	-2.41	-0.70	0.08	1.69
Employment rate, %	32,742	0.10	4.13	-4.51	-0.76	1.12	4.75
Home owner share, %	32,742	2.46	15.79	-14.51	0.00	6.91	23.80
Mean rent per m2	32,680	-0.00	1.75	-1.85	-0.35	0.28	1.83

Table 12: Distribution of neighborhood characteristics change at moving out of WEG



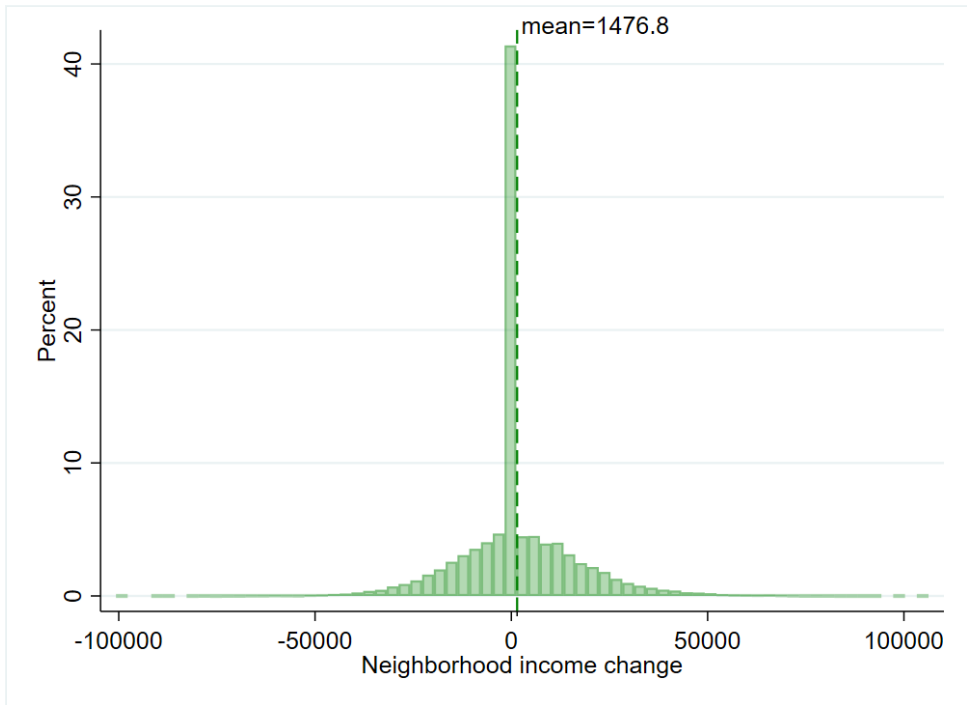


Figure 20: Neighborhood income change at move out of WEG dwelling

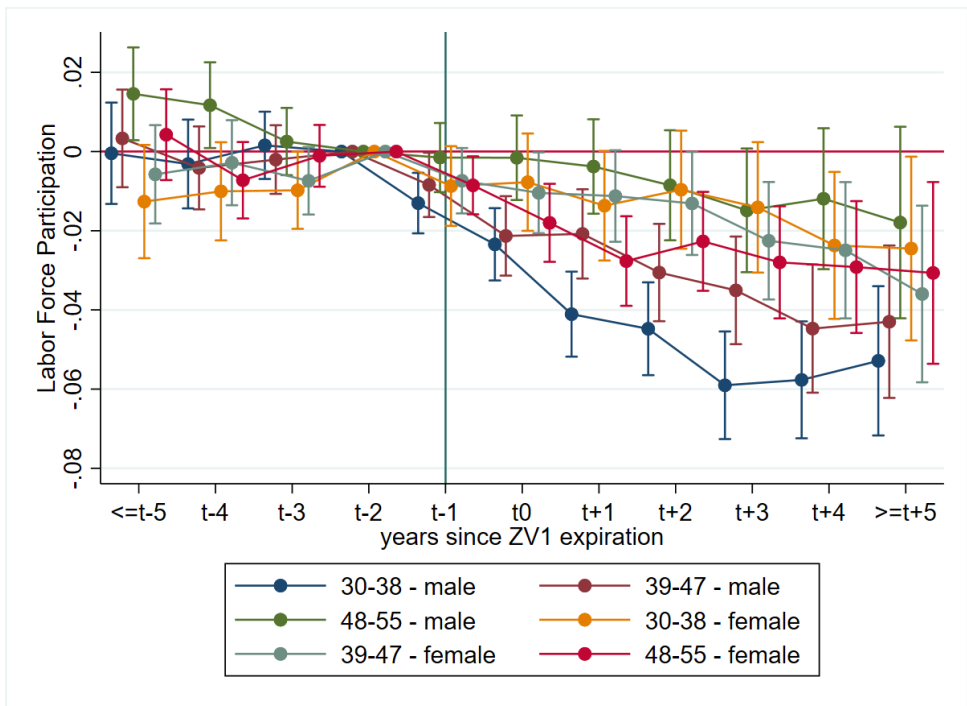


Figure 21: Labor force participation relative to  $t - 2$  by age group and gender

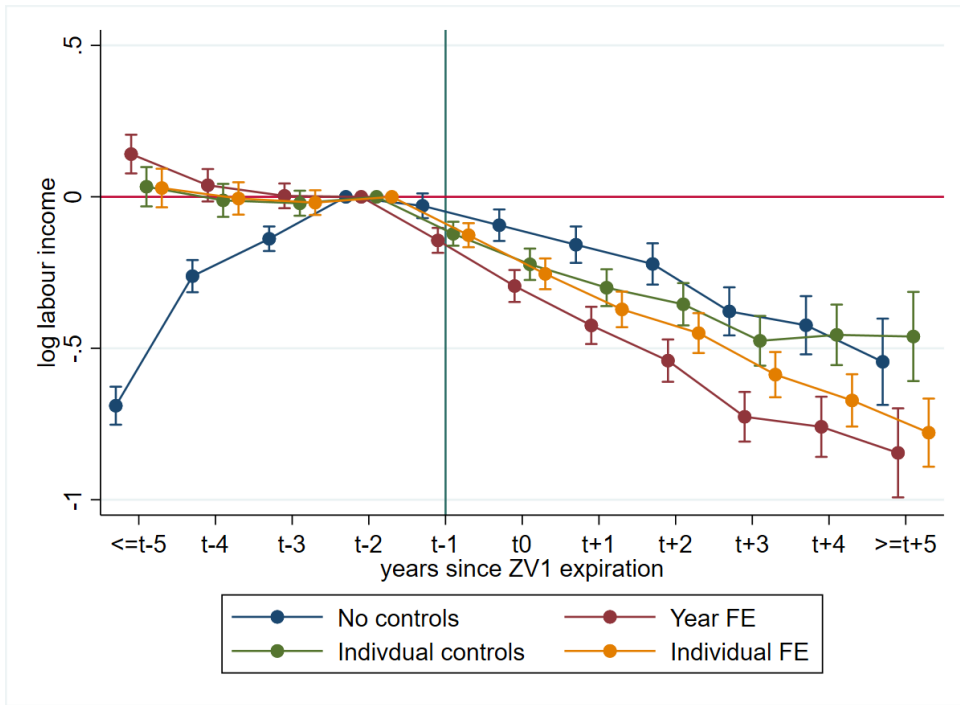


Figure 22: Unconditional log labor income relative to  $t - 2$

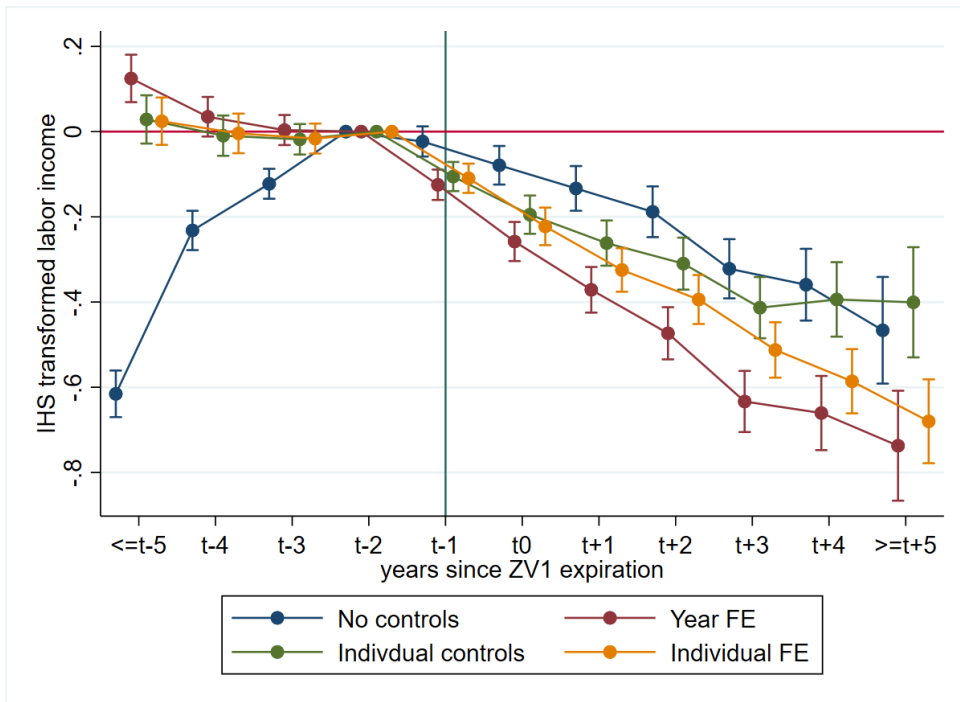


Figure 23: IHS transformed labor income  $t - 2$