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Different Housing Regimes:
First Births in Sweden 1975-2004

by Sara Ström
sara.strom@sociology.su.se

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Childbearing Behavior in the Light of Different Housing Regimes: First Births in Sweden 1975-2004

Sara Ström

Stockholm University Demography Unit

Abstract: A highly plausible assumption is that housing at reasonable costs are directly linked to both young individuals possibilities to form new and independent households and in the longer run to childbearing and family formation. Housing is thus one factor among several that hypothetically influence fertility. The aim of this study is to explore the association between housing and childbearing behavior in terms of first birth propensities during two different housing regimes in Sweden 1975-2004. The main finding from this study is that dwelling size interacts with policy period and that size has become increasingly important in connection to childbirth.

Keywords: housing, housing policy, childbearing, micro-level

1. Introduction

It is a highly plausible assumption that supply of housing at reasonable costs is directly linked to young individuals' possibilities to form new and independent households. Intimately related to this is yet another reasonable assumption: the possibilities for young individuals to form households are directly linked to fertility (see e.g. Hobcraft and Kiernan 1995; Mulder 2006a). Housing is thus one factor among several that hypothetically influence fertility. Previous research has also shown that residential moves and childbearing are interrelated. For example, Kulu and Vikat (2007) as well as Michielin and Mulder (2008) report that residential moves are often made in anticipation of childbirth. The results reported in Ström (2010) indicate that the size of the dwelling is the housing characteristic of greatest importance to first-birth propensities. She also reports that weak attachment on the housing market is a greater obstacle to family formation among younger cohorts than it was for older cohorts. Supply and demand on the housing market is influenced by a number of factors. Among those factors is housing policies, which can be related to fluctuations in housing construction and housing costs including interest rates. Housing policies can thus have a great impact on the likelihood for young individuals to acquire independent housing. Housing policies change over time. Thus, different cohorts often face different housing policies and prerequisites on the housing market when entering adulthood. The aim of this study is to explore the association between housing and childbearing behavior in terms of first birth propensities during two different housing regimes in Sweden 1975-2004. During this period, Swedish housing policies and housing market have undergone dramatic transformations. More specifically, I aim at investigating interaction effects between different housing characteristics (type of housing, tenure, and number of rooms) and policy regime period on first-birth propensities. The data used is the Swedish Housing and Life Course Cohort Study (HOLK), a unique combination of survey and register data collected in 2005. Three birth cohorts are included in this data: the 1956, 1964 and 1974 cohorts.

2. Childbearing behavior in the light of different housing regimes

Sweden is typically used as the prime example of the universalistic welfare state: the state provides a comparatively extensive safety net in areas such as social insurance systems and childcare (Esping-Andersen 1990). Family policy measures such as parental leave insurance, temporary parental leave insurance (care for sick children), childcare, and housing subsidies aimed at families with children are all core characteristics of the Swedish welfare state (see also Orloff 1993; Lewis 1992). Housing policy can – just like parts of health care, taxation etc

– oftentimes be considered an integrated part of family policy (Neyer and Andersson 2008; Kamerman and Kahn 1978). Although there is empirical evidence on the macro-level suggesting that family policy has an impact on childbearing behavior and fertility, the opinions among researchers on the existence and magnitude of the impact differs (Neyer and Andersson 2008; see also Neyer 2003; Gauthier 2007; Hoem 2008). During the period up until the early 1980s family policy in most countries comprised a limited range of measures, while the range of measures in general have been widened later on. To complicate matters further, there are several studies based on micro-level data that indicate an effect of family policy on childbearing behavior (see e.g. Hoem 1990; Andersson 2004; Aassve et al. 2006; Rindfuss et al. 2007). Neyer and Andersson (2008:700) argue that “...the consequences of family policies on childbearing and fertility can be properly assessed only if we study the impact of family policies on individual behavior, taking into account the features of family policies and their various connections with dimensions of time, space and uptake”. They further stress the need of a holistic perspective where we consider different policies and how they counteract and reinforce each other, as well as what the normative goals are, what family forms they support, etc. Housing and housing policy has however been paid very little attention in the comparative research on welfare states (Bengtsson 2006a) not to mention in research on family policy impacts on childbearing behavior and fertility.

The following discussion of housing policy in general and Swedish housing policy in particular is to a large degree based on Bengtsson (2006a; b). As is widely recognized, and as he points out, a central feature in housing policy is that it is mainly realized through the market. The state does not provide housing to its citizens in a welfare state; it gives correctives to the market as to meet the needs of housing in a way that is perceived as fair and just (Bengtsson 1995; 2006a). Swedish housing policy is universalistic in the sense that it is aimed at the entire housing market rather than limited parts of the market. It also aims at neutrality between tenures; all tenures should be treated equally in terms of financing and taxation. However, what makes Sweden unique in an international perspective is the strong tenants’ organization and the almost corporatist system of rent negotiations. In Sweden, the realization of housing policy has taken place foremost through rental housing where the largest actor has been judicial free-standing housing companies owned by the municipalities. However, the most common tenure in Sweden is home ownership, both in terms of number of dwellings and in numbers of occupants (Bengtsson 2006a).

Much of Swedish housing policy has been explicitly targeted at families with children. For example, one of the first measures after the delivery of the final report of *Bostadssociala utredningen* (SOU 1945:63) [The Official Report on Universalistic Housing] was to support dwellings targeted at families with small children and low incomes [barnrikehus]. The vast majority of the dwellings built within “The Million Program” of Sweden in the 1960s (see below) were dwellings large enough for families with children. Housing allowances have always been targeted at specific groups where families with young children make up a substantial proportion of recipients. One long-term goal of contemporary housing policy and housing allowances is to make it possible for families with children to live in dwellings that offer each child a room of their own (prop. 1986/87:48; Boverket 2004). Thus, Swedish housing policy has from its onset been much focused on families with children.

According to Bengtsson (2006a) housing policies in Western European countries has undergone four general phases (see also Jensen 1995). The first phase is the introduction phase. The onset coincides with early urbanization and the phase ends with the Second World War. During this phase, housing becomes a permanent issue in politics. The second phase, the building phase, lasts from the post-war period until the 1970s. The third phase, the administration phase, begins during the 1970s and the focus is on renewal and administration rather than on production. The fourth and last phase, the de-assembly phase, begins in the 1990s. During this phase, housing policies are questioned and reappraised. To different extents housing policies are also de-assembled. Based on the notions of critical junctures and political focal points¹, Bo Bengtsson identifies the beginnings and ends in Sweden of the four different phases. I will concentrate on the last two phases, which are the focus of the empirical analyses of this paper.

During the period 1965-1974, one million new dwelling units were constructed in Sweden within the framework of the so-called Million Program, mainly in the tenure forms public renting and cooperation in order to satisfy the demand for housing. Consequently, the supply of housing increased in the beginning of the 1970s. However, The Million Program gave rise to widespread criticism of large-scale residential areas, and a number of government commissions were appointed during the first half of the 1970s. Three main questions were in focus: (1) increasing segregation; (2) meager outdoor environments; (3) limited residential

¹ Political focal points are defined as e.g. changes in legislation, decisions on financing, etc, while situations when alternative courses of actions are not chosen are defined as critical junctures.

influence. Thus, housing issues were in political focus. This was also indicated by the formation of a new Ministry of Housing. This scenario describes the background of the administration phase. In Bo Bengtsson's classification the beginning of this phase coincides with the establishment of neutrality between tenures 1974-1975 (Bengtsson 2006b). This means that "building subsidies for the first time are accepted as a permanent solution" (Bengtsson 2006b:130, my translation). In plain text this means that taxation and interest rent policies are to gain rental housing, tenant ownership and homeownership equally. The administration phase is characterized by decreasing housing demand. This is mirrored by the fact that mass production of housing decreased. In turn, this resulted in housing areas "less large-scale and more varied" (Bengtsson 2006b:173, my translation) compared to the ones built as part of the Million Program. Towards the end of the administration phase, the costs of building subsidies had increased enormously, reaching almost 300 billion Swedish crowns (approximately 30 billion Euros) for the period 1977-1994 (Borg 2004).

The political focal point that marks the beginning of the de-assembly phase is the appointment of the new conservative government in 1991. Several substantial components of Swedish housing policy were de-assembled during a short period of time. For example, large parts of state subsidies were abolished and replaced by state credit guarantees. The most significant change was the dramatic decrease of building subsidies. Another profound change is the abolishment of three laws: (1) the housing supply law (defining the municipalities' responsibility for their citizens housing); (2) the housing allotment law (defining that the municipalities in certain cases could allot a household a dwelling sublet by a specific landlord); (3) the housing renewal law (defining tenant influence in case of re-building or renewal). One important difference compared with the political focal points connected to the other phases is that the government itself defines the measures as markers of a system shift. According to Bengtsson (2006b) two other characteristics signify the de-assembly phase: the tension between poor and wealthy housing areas (in particular the case in the larger cities), and the tension between regions of out-migration and expanding regions.²

² Other societal changes and developments naturally takes place parallel to the evolvement of Swedish housing policy. For the most time since World War II, Sweden has been a society enjoying almost full employment. However, unemployment did reach relatively high levels during the oil crisis of the early 1970s and the economic crisis of the early 1980s. During the early 1990s Swedish unemployment increased to conspicuously high levels, a period regarded as a time of mass unemployment and severe recession. Although unemployment levels have decreased since the crisis in the early 1990s, they have never reached the low levels prevailing before the crisis. Partly related to the development of unemployment levels, a substantial expansion of higher education has taken place in Sweden since the early 1990s.

So, what are the possible connections between housing policies, housing and childbearing behavior? First, we need to discuss some general questions regarding the relationship between housing and childbearing. The relationship between housing and childbearing is complex and intimately interrelated with factors such as enrolment in education, educational attainment, labor market attainment and income. To be noted is that these are all factors with strong influence on individual childbearing behavior (see e.g. Hoem 2000; Blossfeld and Huinink 1991; Blossfeld and Jaenichen 1992), making housing one factor among several that potentially influence childbearing behavior. I will not develop the discussion on other factors further, but concentrate on housing. It is plausible to assume a causal link running from housing to childbearing as well as a causal link from childbearing to housing. In other words, when access to appropriate housing to reasonable costs is scarce housing can be a constraining factor for childbearing. Further, when access to such housing is easy, it is more likely to assume that the arrival of a child induces residential moves (see Ström 2010 for a more elaborated discussion on this). As has been indicated by the discussion of Swedish housing policies and housing markets so far, access to housing and relative housing costs varies between societies and time periods. Thus, individuals from different birth cohorts face different possibilities of acquiring independent housing during an early stage of adult life. Further, different birth cohorts will experience different conditions on the housing and labor markets, and possibly also different policy regimes.

From a comparative and macro-level perspective, some interesting observations have been made. Italy, Spain and Greece are the three European countries with the highest levels of home-ownership. Those are also countries where the possibility of mortgage loans is very scarce (MacJennan *et al.* 1998; Billari *et al.* 2001; see also Pinelli, 2001; Mulder, 2006b; United Nations 2010). Strikingly, these three countries are also the ones with the highest ages at leaving the parental home and the lowest fertility levels in Europe (Mulder 2006b; United Nations 2010). However, causal conclusions are not readily made since these countries also have family policy models dominated by support from the family rather than state support (Esping Andersen 1990; Mulder 2006b). Focusing on Sweden the human geographer Bo Malmberg (2001) analyzed the co-variation of fertility and housing markets in Sweden 1810-1996 using aggregate data. One finding is that housing costs were negatively associated with aggregate fertility, while consumer prices were positively associated with fertility. His conclusion is that housing costs has had substantial impact on individual level fertility in

Sweden during the study period. However, factors such as unemployment levels and participation in higher education were not considered.

The vast majority of studies on housing and childbearing are based on micro-level data and references to policy or differences between countries are scarce. Although the results are not completely congruent, more or less all of these studies report associations between housing characteristics and childbearing or between residential moves and childbearing. Studies on housing, residential moves and childbearing usually focus on one or more of the following three characteristics: tenure, type and size with the last factor being the least common (see Mulder 2006b; Ström 2010 for discussions on the relevance and significance of the different characteristics).

Both Mulder and Wagner (2001; Netherlands and West Germany) as well as Murphy and Sullivan (1985; Great Britain) suggest synchronization of home-acquisition and childbearing to different extents. Regarding home-ownership and number of children, Murphy and Sullivan (1985) and Krishnan (1988; 1995; Canada) reports contrasting results: signs of postponement and fewer children are found for Great Britain's home-owners while Canadian home-owners on average have more children than tenants. A Swedish study (Statistics Sweden 2005:1) reports that tenant-owners have a lower probability of having a third child compared to others. Focusing on housing type, several studies find a positive association between detached housing and childbearing: Kulu and Vikat (2007) for Finland; Murphy and Sullivan (1985) for Great Britain; Felson and Solauns (1975) for Colombia; and Paydarfar (1995) for Iran. On the other hand, using US-data Curry and Scriven (1978) find that apartment-living is not associated with reduced fertility. For Sweden, a zero-relationship between type of housing and second-birth propensities is reported (Statistics Sweden 2005:1). Thus, in spite of cultural and policy differences, a majority of studies indicate that living in a detached house is associated with a higher propensity for childbearing. It is also interesting to note the zero-relationship found for Sweden, a nation characterized by high housing standard also for apartments. The results reported in the few studies that investigate the association between the size of the dwelling and fertility (Peled 1969 [Israel]; Curry and Scriven 1978; Ström 2010 [Sweden]) are quite clear-cut: the larger the dwelling the higher the fertility. From a Swedish perspective, it is important to note that one long-term goal of housing policy and housing allowances is to make it possible for families with children to live in dwellings that offer each child a room of their own (prop. 1986/87:48; Boverket 2004). In summary, it is difficult to

find any clear patterns that are similar across different countries or types of countries based on micro-level data.

3. A note on tenure forms in Sweden

Based on historical traits, the Swedish housing market is characterized by three different tenures: home-ownership, owner-tenant and tenants. Home-ownership is synonymous to detached housing or rowhouses since apartments cannot be owned by an individual in Sweden. Rowhouses can also be accessed through owner-tenancy³. This is defined as the right to use the dwelling during indefinite time, while an association of tenant owners in the building is the formal owner of all dwellings in the real estate. Apartments are accessed through either owner-tenancy or tenancy. Tenancy is divided between public and private companies. A tenancy contract between the tenant and the landlord is a long-term agreement including possession rights. In the inner cities in particular a tenancy contract is indicative of a strong establishment on the housing market. Dwellings accessed through first hand contracts can be sublet to a third person. Sub-tenancy implies a much weaker establishment on the housing market as compared to a first-hand contract. The distribution between the tenures in 2004 was 40 percent home-ownership, 17 percent owner-tenancy, and 43 percent rental tenancy (Bengtsson 2006).

4. The Swedish Housing and Life Course Cohort Study

Up until recently, the only way to study the significance of housing for families and family formation in Sweden has been to use large register-based data sources or censuses. The latter has not been carried out in Sweden since 1990. Register based studies are characterized by several limitations. One of them is that information on unregistered moves is missing. Further, they lack information on tenant holders for rental apartments. This means that we have no information on whether individuals have first- or second-hand leases. It is also difficult to get a true picture of how many individuals actually live in a particular residence. Another constraining characteristic of register data is that we lack information on cohabiting, unmarried, couples without children. Thus, we don't know when the individuals are "under risk" for childbearing, i.e. we cannot distinguish cohabitants from lone residents among those who are childless and in childbearing ages. These limitations hold for register data⁴, but not

³ A very small number of "rowhouses" (i.e. dwellings situated in a building with three or more houses in a row that share a wall with at least one adjacent neighbor) are accessed through rental tenancy.

⁴ However, it should be noted that a dwelling register is now being implemented which will improve the situation for future research.

for census data. However, census data is not biographical but collected at distant cross-sections of which the last was carried out in 1990. The alternative to register or census data is surveys in which a partner- and marriage biography often is included. Existing surveys (e.g. the Level of Living Survey and Survey on Living Conditions) in general measure housing situation at cross-sections only, which is not sufficient from a methodological point of view. For example, with cross-sectional data it is difficult to determine the temporal order: what comes first changes in housing situation or childbirths?

The Swedish Institute for Futures Studies collected a data set in 2005 designed to study housing conditions and childbearing: The Swedish Life Course and Cohort Study (HOLK) (see Ström et al. forthcoming).⁵ These data are used in the empirical analyses in this study. The HOLK-data are a combination of survey and register data. The sample consists of 3 600 individuals born in Sweden, and is divided between the three cohorts born in 1956, 1964 and 1974. The cohorts are selected in order to reflect different historical periods in Swedish housing policy and labor market (see above). The data collection was carried out during the spring of 2005 and was administered by Statistics Sweden in Örebro. The method of collection was postal questionnaires with one postal follow-up and subsequent telephone follow-up. The response rate was 62 percent or 2 242 individuals. As a whole, the material presents a clear picture of partner biographies, education and labor market attachment, childbearing and last but not least housing. Register data have been linked for each respondent, legally married partners, and for unmarried cohabitants with common children the child's other parent. The central part of the questionnaire is the housing biographies that never before have been collected to this extent. The housing biographies have been complemented with register data on residential moves including information on year, month and location. Another important component is the partner- and marriage biographies that enables us to determine when individuals are "under risk" of childbearing. These self-reported biographies have been complemented with register data on changes in civil status.

Information on education has been gathered from register data for both the respondent and partners (for present partners also through the questionnaire). Extensive register data on incomes and transfers have also been linked. This makes it possible to follow individuals'

⁵ The questionnaire and register extract have been designed by Sara Ström in collaboration with Elizabeth Thomson (Stockholm University and University of Wisconsin-Madison), and Statistics Sweden in Örebro and Stockholm.

labor market attachment from the entry into the labor market and onwards. One way to operationalize this is to measure the proportion of the total annual income that comes from work. When it has been possible (mostly from the 1990s and onwards) register data on occupation and workplace have been linked. Finally, data on biological and adopted children have been linked. In addition, a number of attitudinal questions and questions directly linked to family, children and housing are included in the questionnaire. One example is information on whether the respondent reported that the family became crowded or that the housing standard was insufficient subsequent to the birth of children. In summary, the material is unique in both Swedish and international perspective.

5. Methods and variables

The focus in this study is the transition from the childless state to parenthood over time. The most appropriate way to study this transition is to use intensity regression. The dependent variable used in the empirical analyses is the hazard rate:

$$h(t / X(t)) = \lim_{\Delta t \rightarrow 0} \frac{P(t, t + \Delta t | T \geq t, X(t))}{\Delta t}, \quad (1)$$

where T is the time of the birth of the respondent's first child, t is any fixed point in time under risk, while $p(t, t+\Delta t)$ is the probability that the event occurs in the interval $[t, t+\Delta t)$, and $x(t)$ is a vector of covariates, given that the event has not occurred before t . The observation window opens the year the respondent turns 20, and closes either at the time of the first birth, at age 40, or at the time of data collection. Changes in housing status, duration in current dwelling, union status, income and individual unemployment (measured annually) are treated as time-varying covariates. The housing policy periods have been defined by Bengtsson (2006) as 1975-1991 and 1992-onwards.

The year and month of first births has been collected through register data from Statistics Sweden. Adopted children are included in the analyses, but the respondent is censored at the time of the birth and the event is thus not included. Births of twins and triplets are treated as single-child births. Type of dwelling is divided into four categories: apartment, rowhouse, detached, and other. Tenure is also divided into four categories: home-owner (including tenant-owner), first-hand lease, second hand lease, and lodger. Number of rooms is included as a categorical variable as follows: one, two, three, and four or more rooms. Year of moving, type of dwelling, tenure and number of rooms are self-reported. Each self-reported move has

been matched to register data on moves from Statistics Sweden in order to obtain information on month and geographical locality (see also Ström et al., forthcoming).

Information on gender and age has been collected through register data from Statistics Sweden. Union status is self-reported and includes both marriages and consensual unions. Household income is defined as income from employment and includes income from both partners in a union if they are married or otherwise can be linked in the registers. Otherwise the income is recorded for the respondent only. For partners, information on income is included from the year of entering shared residence. Information on household income has been collected from Statistics Sweden, and has been divided into three groups based on percentiles (low, middle, high).

6. Results

In Figures 1-3 below, we find graphical illustrations of the development of total fertility rates (TFR) (Figure 1), construction of dwellings (Figure 2), and housing subsidies (Figure 3) for the period 1975-2004.

Figure 1. Total fertility rate, Sweden 1975-2004. Source: Statistics Sweden

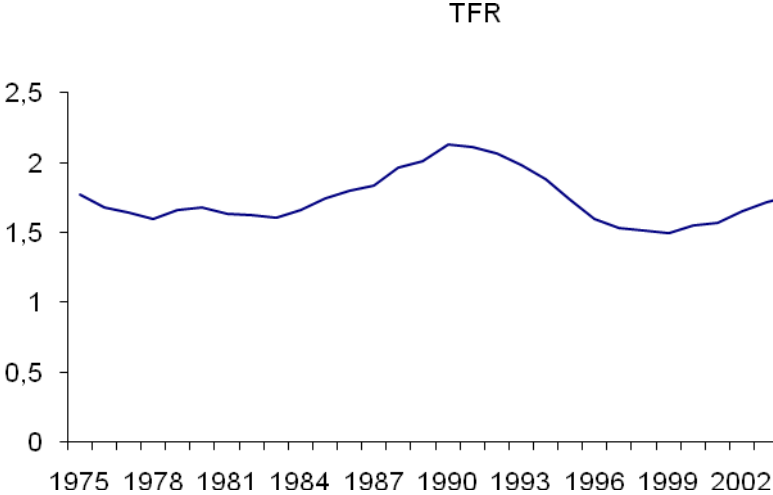


Figure 2. Housing subsidies, Sweden 1975-2004. Source: National budgets

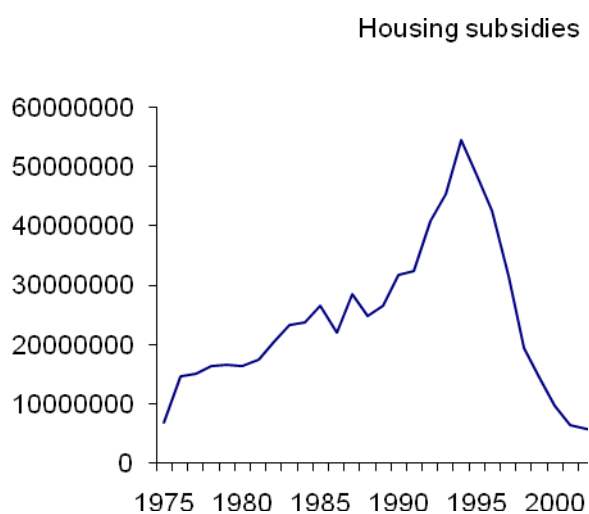
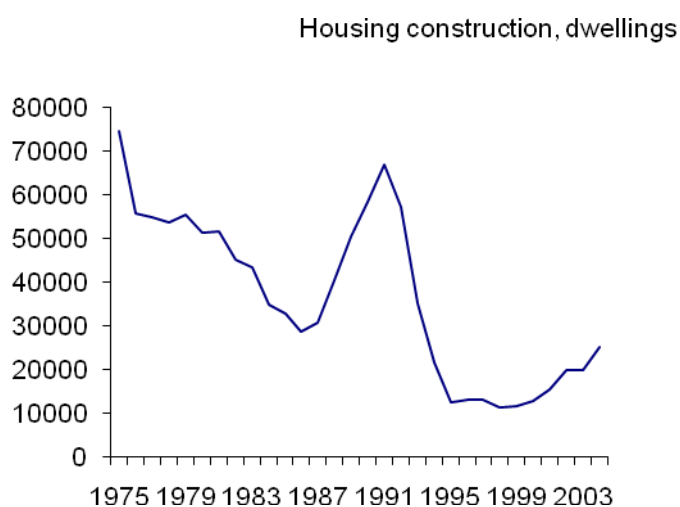


Figure 3. Housing construction, dwellings, Sweden 1975-2004. Source: Statistics Sweden



There are several striking similarities between these figures. In particular, and not surprisingly, there is a strong similarity between housing construction and housing subsidies, especially from the mid to late 1980s and onwards. When comparing TFR with the development of housing construction, the similarity is obvious. The major difference is that the TFR-curve is smoother compared to the housing construction curve. In addition, there are also obvious similarities between TFR and housing subsidies during the observed period. However, the similarity between TFR and housing subsidies is less obvious than the similarity

between TFR and housing construction in particular for the beginning of the period. Naturally, one cannot draw any causal conclusions based on these three diagrams. First, there are strong arguments for using micro-level data when studying policy effects on childbearing behavior (see discussion above). Second, there are two common factor also varying during this period that are likely to influence both TFR, housing construction and housing subsidies; namely the business cycle and unemployment levels. I will return to this in the concluding discussion.

In Tables 1-3 below, analyses are shown of the three housing factors *type*, *tenure* and *size* in relation to first birth propensities. The analyses are performed separately at ages 20s and 30s in order to control for the differences in behavior in relation to having the first child early in the life course as compared to relatively later. For each age span, two models are presented. The first model contains simple effects of both policy period and housing characteristics. In the second model, I include interaction terms of policy period and housing characteristics. After having run the second model, I have performed likelihood-ratio tests aimed at determining whether the interaction term adds to the model fit or not. Thus, the interpretation of a significant likelihood-ratio is that there is indeed a significant interaction between policy period and the housing characteristic in question.⁶ All models control for duration in the current dwelling, union status, sex, household income and individual unemployment.

⁶ For reasons of simplicity I include combination variables in the tables. The likelihood-ratio test is performed on models using multiplicative variables. The results of these two different ways to perform the analyses are identical.

Table 1. Basic exponential hazard regression. Type of housing, housing policy regime, and first births. Hazard Ratios (HR). The Swedish Housing and Life Course Cohort Study.

	20s		30s	
	Model 1	Model 2	Model 1	Model 2
	HR	HR	HR	HR
Policy period (1975-1991)				
1975-1991	1.38***		0.92	
1992-	REF		REF	
Type of housing				
Apartment	0.54***		0.74**	
Rowhouse	1.13		1.25	
Detached	REF		REF	
Other	0.28***		0.38	
Type of housing x Policy period				
Apartment 1975-1991 1992-		0.69*** 0.45***		0.73** 0.68**
Rowhouse 1975-1991 1992-		1.38* 1.02		1.10 1.21
Detached 1975-1991 1992-		1.12 REF		0.80 REF
Other 1975-1991 1992-		0.25* 0.00		0.00 0.00
Duration				
12 months <	2.26***	2.25***	3.33***	3.33***
12 months > 32 months	1.22**	1.22**	1.79***	1.79***
32 months >	REF	REF	REF	REF
Union (yes)	15.76***	16.08***	13.98** *	14.08***
Sex (female)	1.03	1.03	1.02	1.02
Income				
Low	REF	REF	REF	REF
Middle	0.79***	0.79**	0.67**	0.68**
High	0.63***	0.64***	0.53***	0.54***
Respondent unemployed (yes)	0.99	0.99	0.82	0.83
No of subjects	2049		1051	
No of events	1001		413	
Time at risk	158497		52502	
LR-test				
LR, chi2	6.98		3.16	
Prob > chi2	0.07		0.37	

*** p<0.01, ** p<0.05

In Table 1, the focus is on housing type and possible interactions with policy period on the propensity to have the first child. In Model 1, we find a significant effect of policy period on the propensity of having the first child in the 20s. The propensity is higher for the administration phase 1975-1991 compared with the period 1992 and onwards. This follows from a general tendency of postponement of first births. According to Model 1, living in an

apartment is related to lower first birth propensities compared to living in a detached house for respondents both in their 20s and 30s. When the simple effects are excluded and interaction effects are included (Model 2) we find some scattered significant results. For example, living in an apartment is again related to lower first birth propensities as compared to living in a detached house. This is the case for both people in their 20s and the 30s, and for the period 1975-1991 as well as 1992 and onwards. However, the likelihood-ratio test shows that the interaction between policy period and housing type is not significant.

In Table 2, the analyses for tenure and policy period are found. As was the case for housing type, we find a significant effect of policy period in the analyses for respondents in their 20s (Model 1). The first birth propensity of young people is higher for the administration phase 1975-1991. Further, in Model 1 we find the following consistent result for both respondents in their 20s and in their 30s: being a tenant (regardless of having a firsthand contract or subletting) or being a lodger is associated with lower first birth propensities compared to being a home-owner.

Part of the results found in Model 2 of Table 2 contradicts the findings of Model 1. Let us first concentrate on the respondents in their 20s. Compared to being a homeowner during the de-assembly phase 1992 and onwards, the propensity to have the first child is greater both for homeowners and first-hand tenants 1975-1991 but lower for second-hand tenants during the same period. More surprising, being a tenant (regardless of first or second hand lease) during the period 1992 and onwards is associated with higher first birth propensities compared to being a homeowner during the same period. The same result is found for respondents in their 30s. However, while the likelihood-ratio test indicates that the interactions for the younger age group significantly add to the fit, the interactions for the older age group do not.

Table 2. Basic exponential hazard regression. Tenure, housing policy regime, and first births. Hazard Ratios (HR). The Swedish Housing and Life Course Cohort Study.

	20s		30s	
	Model 1	Model 2	Model 1	Model 2
	HR	HR	HR	HR
Policy period				
1975-1991	1.38***		0.92	
1992-	REF		REF	
Tenure				
Home-owner	REF		REF	
1st hand tenant	0.61***		0.71**	
2nd hand tentant	0.22***		0.60*	
Lodger	0.36***		0.49*	
Tenure x Policy period				
Home-owner 1975-1991 1992-	2.35***	REF	1.21	REF
1 st hand tenant 1975-1991 1992-	1.63***	2.24***	1.00	1.75**
2 nd hand tentant 1975-1991 1992-	0.50**	2.29***	0.89	1.46**
Lodger 1975-1991 1992-	1.13	0.00	0.88	0.00
Duration				
12 months <	2.39***	2.27***	3.49***	3.30***
12 months > 32 months	1.26**	1.21**	1.91***	1.81***
32 months >	REF	REF	REF	REF
Union (yes)	15.19***	15.46***	14.21***	13.57***
Sex (female)	1.05	1.03	1.04	1.02
Income				
Low	REF	REF	REF	REF
Middle	0.78**	0.78**	0.65***	0.67***
High	0.61***	0.63***	0.51***	0.54***
Respondent unemployed (yes)	0.98	0.99	0.83	0.79
No of subjects	2073		1048	
No of events	1018		415	
Time at risk	162555		52852	
LR-test				
LR, chi2	7.94		2.03	
Prob > chi2	0.05		0.56	

*** p<0.01, ** p<0.05

Table 3. Basic exponential hazard regression. Number of rooms, housing policy regime, and first births. The Swedish Housing and Life Course Cohort Study.

	20s		30s	
	Model 1	Model 2	Model 1	Model 2
	HR	HR	HR	HR
Policy period (1975-1991)				
1975-1991	1.32***		0,90	
1992-	REF		REF	
No of rooms				
1 room	0.19***		0,82	
2 rooms	0.67***		0,80	
3 rooms	REF		REF	
4 or more rooms	1.34***		1,42***	
No of rooms x Policy period				
1 room 1975-1991 1992-	0,30***	0,10***	1,51	0,56
2 rooms 1975-1991 1992-	0,89	0,55***	1,00	0,67**
3 rooms 1975-1991 1992-	1,20	REF	0,89	REF
4 or more rooms 1975-1991 1992-	1,59***	1,37**	1,09	1,52***
Duration				
12 months <	2.15***	2.16***	3,26***	3,22***
12 months > 32 months	1.20**	1.20**	1,77***	1,76***
32 months >	REF	REF	REF	REF
Union (yes)	11.40***	11.54***	12,29***	12,47***
Sex (female)	1.03	1.03	1,02	1,03
Income				
Low	REF	REF	REF	
Middle	0.79**	0.78**	0,66***	0,67***
High	0.63***	0.63**	0,51***	0,51***
Respondent unemployed (yes)	1.02	1.02	0,83	0,86
No of subjects	2053		1052	
No of events	1011		418	
Time at risk	159771		53146	
LR-test				
LR, chi2	8.52		11.12	
Prob > chi2	0.04		0.01	

*** p<0.01, ** p<0.05

In the last table (Table 3) focus is on the size of the dwelling in terms of number of rooms. Model 1 shows that living in a dwelling with one or two rooms is associated with lower first birth propensities compared with living in a dwelling with three rooms among respondents in their 20s. Further, living in a dwelling with four or more rooms is associated with higher first birth propensities in the same group of respondents. Among respondents in their 30s, the size

of the dwelling is apparently of less importance. In Model 1 we however find a significant and positive effect of living in a dwelling with four or more rooms for this group. The results found in the interaction models (Model 2) are quite congruent. Respondents in their 20s have lower first birth propensities when they live in a dwelling with one room (1975-1991 as well as the de-assembly phase 1992 and onwards) or two rooms (1992 and onwards only) compared to living in a dwelling with three rooms during the period 1992 and onwards. Living in a dwelling with four or more rooms is associated with higher first birth propensities during the same period. As in Model 1, size seems to matter less for the older age group. For this age group, we find that living in a dwelling with two rooms is associated with lower first birth propensity while living in a dwelling with four or more rooms is associated with a higher propensity compared with living in a dwelling with three rooms during the period 1992 and onwards. According to the likelihood-ratio test interactions add significantly to the model fit both for respondents in their 20s as well as in their 30s.

Regarding the control variables the pattern is identical across housing characteristics, age groups and models. First birth propensities are higher during the first 12 months in a new dwelling as well as during the subsequent 20 months as compared to having lived 32 months or more in the same dwelling. Living with a partner substantially and significantly increases the first birth propensity. Higher incomes somewhat surprisingly lower the first birth propensity.

7. Discussion

The aim with this study has been to explore the relationship between housing and childbearing during two different housing policy regimes: the administration phase 1975-1991 and the de-assembly phase 1992 and onwards. I have demonstrated that on the macro-level the development of total fertility rates, housing subsidies and housing construction for the period 1975-2004 in Sweden are quite similar. However, one cannot make causal conclusions from these observations. From the discussion on family policy and childbearing behavior earlier in this study, it is apparent that we need micro-level data to attempt to make causal analyses. So, what do we find when we analyze micro-level data? Models that include policy period and housing characteristic as separate variables indicate that the first birth propensity is higher for the period 1975-1991 compared to 1992 and onwards, controlling for such factors as income, individual unemployment, union status, etc. Regarding housing characteristics, living in an apartment is associated with lower first birth propensities compared to living in a

detached house (Table 1); and that being a tenant or lodger is associated with lower first birth propensities compared to being a homeowner (Table 2). These results hold for both younger (20s) and older (30s) respondents. In addition, to live in a dwelling with one or two rooms is associated with lower first birth propensities compared to living in a dwelling with three rooms for respondents in their 20s, while the size of the dwelling seems to be of lesser importance for respondents in their 30s (Table 3). These results are in line with previous research (see e.g. Ström 2010; Kulu and Vikat 2007). In order to study the possible impact of policy period on the relationships between housing and childbearing behavior I performed interaction models and used likelihood-ratios tests to test whether the interaction added to the explanatory value or not. Interactions between housing type and policy period do not significantly increase the explanatory value, while interactions of tenure and policy period as well as number of rooms and policy period significantly improves the models.

Compared to home-owners during the de-assembly phase 1992 and onwards, being a tenant during the same period is associated with higher first-birth propensities. This is the case regardless of whether the respondent is first- or second-hand tenant, and regardless of whether the respondents are in their 20s or their 30s. For the younger age group, we also find that being a homeowner or a first-hand tenant during 1975-1991 is associated with higher first-birth propensities compared to being a homeowner 1992 and onwards, while being a second-hand tenant is associated with a lower first-birth propensity. However, only the interactions for respondents in their 20s significantly improve explanatory value. One possible explanation is that home-ownership and family formation are competing costs (Courgeau and Lelievre 1992). The finding that homeowners in their 20s during the period 1975-1991 have a higher first-birth propensity could be interpreted as support for this argument since the cost of homeownership was comparatively lower during this period.

Focusing instead on the interaction between number of rooms and policy period, we find that compared to living in a dwelling with three rooms 1992 and onwards living in a dwelling with two rooms is associated with lower first-birth propensities during the same period while living in a dwelling with four or more rooms is associated with a higher propensity. This is the case both for respondents in their 20s and in their 30s. In addition, for respondents in their 20s living in a one-room-dwelling during the period 1992 and onwards is associated with lower first-birth propensities. We also find significant interaction effects between size of the dwelling and the administration phase 1975-1991 for the younger age group: living in a

dwelling with one room is associated with lower first birth propensities while living in a dwelling with four or more rooms is associated with higher propensities. Thus, dwelling size becomes much more important during the latter period. This might be due to higher aspirations for dwelling size in connection to child birth.

As has been discussed earlier in this paper, the focus on the relationship between housing policy, housing and childbearing behavior on the micro-level is novel. Thus, there are no previous studies to compare these results with. What should be noted is that the administration phase 1975-1991 is characterized, among other things, by a greater supply and easier access of housing compared with the de-assembly phase 1992 and onwards. Naturally, the fact that the business cycle and the unemployment levels influence childbearing behavior as well as dwelling construction and housing subsidies makes it very difficult to draw any causal conclusions from either the superficial macro-level depictions introducing the results or the more elaborated micro-level analyses. This is partly compensated by the fact that the micro-level analyses are controlled for individual unemployment. One possible interpretation of the results is that these different factors –housing policy and housing markets on the one hand and the business cycle and the unemployment levels on the other hand – reinforce each other. This could contribute to the explanation of the fluctuations in total fertility rates in Sweden. Future studies should include more detailed analyses of policy implications on an individual level.

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