



Unemployment risk and the timing of homeownership in Japan

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ABSTRACT

We examine the effect of unemployment risk on the timing of homeownership applying a survival analysis approach. Empirical results from the Split Population Duration (SPD) model suggest that: (1) unemployment risk has a significantly negative effect on homeownership and delays its timing even after controlling for income variability measures, (2) the null hypothesis that every household will eventually become a homeowner is rejected, which supports the SPD model against the standard duration model, and (3) the standard duration model underestimates the effects of both unemployment risk and income variability. Finally, our simulation results indicate that changes in unemployment risk have a fairly large impact on the probability of home purchase—a 10 percentile increase in unemployment probability from its median level would reduce the probability by 2.0 percentage point, whereas comparable changes in income variability measures would reduce the probability mere 0.2–0.3 percentage points.

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1. Introduction

Although there are several sources of the uncertainties that a household faces during its lifetime, income uncertainty might be the most serious one, particularly for a young household that desires to be a homeowner. While the majority of previous studies used income variability as a proxy for income uncertainty, there exists more serious type of income uncertainty—households' unemployment risk. Unemployment should be the most extreme form of income reduction that can arise during a household's lifetime.

There are several reasons to expect that unemployment risk will impact homeownership, even after controlling for income variability. First, income variability may not be able to capture the sole effect of income uncertainty. There may be a trade-off between income variability and unemployment risk. For example, in Japan, workers with a permanent job receive bonus payments which are linked to company performance. On the other hand, temporary workers generally receive a fixed payment regardless of the company performance. Hence, conditional on being employed, the former faces greater income variability than the latter. At the same time, however, it is quite natural to expect that temporary workers are more likely to be laid off than permanent workers.

Moreover, since unemployment forces households to lose not only a stable future income stream but also all of the fringe benefits of employment (such as social and health securities, subsidized hous-

ings, and several allowances), its effect on housing tenure transition is much more than a simple reduction in income.²

Second, unemployment risk, often measured by an individual's job tenure or past experience with unemployment, is a typical screening device for credit rationing by lenders.³ According to the Survey of Housing Market Trends (Ministry of Land, Infrastructure, Transport and Tourism, 2006), almost 20% of the households that purchase their own houses are credit rationed due to their unemployment risk.⁴

Owing to these reasons, a household with a higher unemployment risk tends to delay the timing of tenure transition until it obtains a stable job, or it is discouraged from becoming a homeowner. At an aggregate level, a negative relationship between unemployment and homeownership rates might constitute a good evidence of the effect of unemployment risk on housing tenure transition. Fig. 1 illustrates

² Unemployment insurance (UI) systems can play an important role in alleviating the income loss by providing unemployment benefits to unemployed. However, the coverage (amount and extent) of unemployment benefit is limited in Japan. According to the recent report by International Labor Organization (2009), percentage of unemployed workers not receiving unemployment benefits is 77% in Japan, which is highest among major developed countries (U.S., Canada, U.K., France, and Germany). The reason for this high percentage is attributed to somewhat strict eligibility conditions and an increased number of non-regular workers who are generally out of coverage under Japanese UI system. Hence we can expect that unemployment risk may have severe impact especially in Japan.

³ In Japan, mortgage contracts rarely include an insurance against unemployment. This would make mortgage lenders reluctant to grant loans to risky households.

⁴ It should be noted that this survey comprises only those respondents who purchased their homes in 2005. In other words, those who were rationed and did not purchase a home are not included in the survey, thus implying that the share of credit rationed households is almost certainly underestimated.

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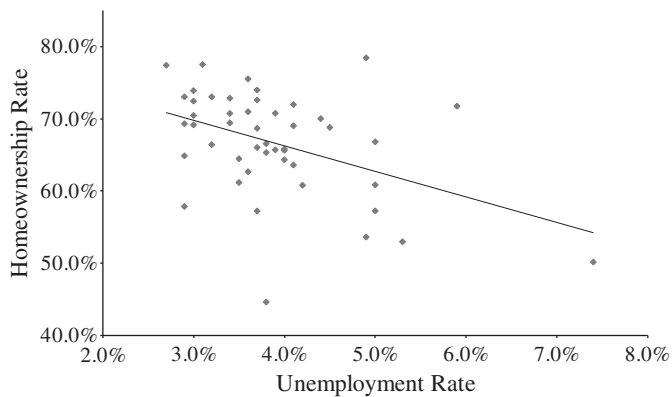


Fig. 1. Unemployment and homeownership rates of prefectures.

the relationship between unemployment and homeownership rates of Japanese prefectures in 2008. Clearly, a widespread homeownership can be observed in low-unemployment rate prefectures.⁵

There are several theoretical studies that address the relationship between income uncertainty and homeownership. DeSalvo and Eeckhoudt (1982) theoretically predict a negative relationship between housing consumption and the probability of unemployment. Turnbull et al. (1991), using a similar framework, demonstrate that a mean preserving spread of an uncertain income lowers housing consumption; however, when the expected wages are embedded in the compensating differentials for income risk, the relationship becomes ambiguous. Fu (1995) analyzed the demand for housing in the presence of liquidity constraints and house price uncertainty. It is shown that an increase in income variability (or a forward tilting in the income path) will have either a positive or a negative effect on homeownership depending on the household's attitude towards risk.

Since theoretical predictions are ambiguous, several empirical analyses have been presented to investigate the relationship between income uncertainty and homeownership. Haurin and Gill (1987) and Haurin (1991) find that the households which are likely to have lower income variability tend to own their houses. Robst et al. (1999), using several measures of expected income variability, also find a negative relationship between income variability and the likelihood of homeownership. More recently, Diaz-Serrano (2005a,b), using data from three countries, reveals the negative effect of income uncertainty on the probability of homeownership. With regard to unemployment risk, Di Salvo and Ermisch (1997) find that unemployment risk, as indicated by the regional unemployment rate, has a significantly negative effect on the probability of homeownership in Britain. However, their measure of unemployment risk is not individual-level, but rather a regional-level unemployment rate.

The objective of our paper is to examine the effect of income uncertainty on the timing of homeownership. We use two different measures of income uncertainty—income variability and unemployment risk. While previous studies use only the former measure of income uncertainty and investigate the effect on homeownership, this paper introduces the latter as well, which includes a much broader range of income uncertainty. Furthermore, we adopt two alternative approaches to estimate income variability suggested by the previous studies.

We apply Split Population Duration (SPD) model, which is in a general class of a discrete-time hazard model, to the most recent

household panel data in Japan. With the SPD model, households make two decisions: they decide whether to purchase a house during their life course and then what period (if any) to purchase a house conditional on the former decision.

The remainder of the paper is organized as follows. Section 2 presents the estimation method. A brief description of the data and variables are provided in Section 3. Section 4 provides the empirical results and discusses the effects of two different measures of income uncertainty on the timing of homeownership. Finally, Section 5 concludes the paper.

2. Empirical model and estimation method

2.1. Survival analysis of the timing of homeownership

There are several empirical studies that investigate the timing of homeownership using a survival analysis approach. Guiso and Jappelli (2002) examine the relationship between a private transfer and the timing of tenure transition. Deutsch et al. (2006) and Tiwari et al. (2007), focusing on wealth accumulation and liquidity constraints, estimate the duration until home purchase. All these studies apply a standard continuous-time approach such as the semi-parametric Cox proportional hazard model or the parametric Weibull model.

Standard discrete-time survival models estimate the hazard rate of home purchase, i.e., the probability of home purchase conditional on waiting until a certain point of time. An important assumption of these models is that all households will eventually purchase their own homes, which restricts the ultimate homeownership rate to unity, even though the observed homeownership rate is smaller than unity. By excluding this assumption, the SPD model estimates the likelihood of a household eventually purchasing a home as well as the timing of its home purchase. The SPD model is applied to several topics including smoking behavior (Forster and Jones, 2001; Kidd and Hopkins, 2004), criminal recidivism (Schmidt and Witte, 1989), and bank failure (DeYoung, 2003). However, as far as we know, no previous study has applied the SPD model to the timing of homeownership. It should be noted that the standard model is in fact a special case of the SPD model.⁶ Our empirical result rejects the assumption of the standard duration model, implying that the SPD model is better than the standard duration model in our application.

2.2. Econometric model

Households maximize their lifetime utility within an intertemporal framework. Those households that live in rental housing plan to purchase a house if the lifetime utility of owning a house is greater than that of renting. Once a household decides to own a house, the timing of its housing purchase is jointly determined depending on the unemployment risk, household wealth, income, housing prices, and other demographic factors.

Let e_i be an unobservable variable expressing the home purchase decision of household i . If a household decides to purchase a house at a certain time in the future, $e_i = 1$, and if it decides to continue renting a house, $e_i = 0$.

For a household that decides to purchase a house ($e_i = 1$), the timing of its home purchase is jointly determined. The timing is measured by the duration until a house is purchased. There are two types of samples in our data—households with complete spells and those with incomplete spells (i.e. right-censored). The households in

⁵ The underlying causality between unemployment and homeownership rates should be examined carefully. Previous studies suggest that homeownership results in negative outcomes in the labor market (Oswald, 1999). However, if that theory is correct, regional unemployment rate should be positively associated with homeownership rate. Hence the theory by itself cannot explain the observed relationship presented in Fig. 1.

⁶ Another point to be noted is that the presence of tied events may cause problems, especially when the unit of time is large. Since the underlying continuous-time process has a zero probability for tied events, the presence of many ties may lead to biased estimates in the case of a continuous-time model (Yamaguchi, 1991). A discrete-time model is more appropriate than a continuous-time model and, therefore, is applied in our analysis by using yearly data.

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