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Review Article

Loss aversion and duration of residence

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Contents

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Abstract

BACKGROUND
Studies of internal migration ask who moves, why they move, and what are the consequences − to themselves, their origin, and their destination. By contrast, studies of those who stay for very long durations are less common, despite the fact that most people move relatively infrequently.

OBJECTIVE
We argue that staying is the dominant, preferred state and that moving is simply an adjustment toward a desired state of stability (or equilibrium). The core of our argument, already recognized in the literature, is that migration is risky. However, we extend the argument to loss aversion as developed within prospect theory. Prospect theory posits that existing possessions, including the dwelling and existing commodities, are attributed a value well beyond their purchase price and that this extends the average period of staying among the loss-averse.

METHODS
Applying prospect theory has several challenges, including measurement of the reference point and potential degrees of gain and loss households face in deciding to change residence, as well as their own degree of loss aversion. The growing number of large panel sets should make it possible to estimate the degree to which endowment effects are likely to extend durations of residence as predicted by prospect theory.

CONCLUSIONS
Rational expectations models of mobility focus on the changes in the level of consumption of residential services. By contrast, prospect theory focuses on potential gains and losses relative to the existing dwelling − the reference point. As we confront increasing durations of residence in contemporary society, an application of prospect

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theory is likely to yield important advantages over existing models of mobility and staying.

1. Introduction

This paper has been written in a period of rising social and personal uncertainty as globalized societies face greater uncertainty about their futures (Beck 1999). Partly as a result, an increasing proportion of people are now exercising a strong personal and social bias against moving, against changing residence (Cooke 2012; Molloy, Smith, and Wozniak 2011). Instead of characterizing society as mobile and restless, more writers now emphasize immobility and rootedness (Cooke 2011), though this observation varies a great deal according to national contexts (Champion and Shuttleworth 2015). The concern with immobility is also being driven by aging societies and the tendency generally to stay with age (Fernandez-Carro and Evandrou 2014). In order to focus attention on the role of stability and the potential risk of loss associated with moving, we draw on a set of ideas embodied in prospect theory, as introduced by Kahneman and Tversky in 1979. Surprisingly, and despite their repeated use of household relocation in examples (Kahneman 2011: Chapters 26 and 27), prospect theory does not appear to have received any attention from students of mobility or migration.

The primary concern expressed by Kahneman and his coauthors has been what they believe is a fundamental misreading of what motivates human behavior as embodied in the rational expectations model. Since the rational expectations model continues to drive most academic approaches to mobility and migration, certainly in economics, the lack of attention to the critique embodied in prospect theory is somewhat surprising. Thus we begin by outlining the central tenets of the theory, then we embed it within a wider critique of the rational expectations model as advanced by behavioral economics. Terms like 'the value function,' 'endowment,' and 'loss aversion' will be new to some in demography and therefore we make a special effort to spell out the argument from first principles. After outlining the model, we discuss how these ideas might be integrated into demographic thinking about mobility and migration.

2. Behavioral economics and prospect theory

There have been several reviews addressing the interface between economics and psychology (Rabin 1998; Headey 1993) but few explore the links between demographic processes and psychology, despite some promising discussions (Moon 1995) and a number of more recent connections (Oishi 2010; Oishi et al. 2011; Oishi and Talhelm 2012). Terms like irrational exuberance, nudge, and animal spirits have now become part of the contemporary lexicon for our understanding of how people actually behave when it comes to investments. Similarly Akerlof and Shiller's (2009) *Animal Spirits* was written to promote an understanding of the role played by emotions in influencing economic decision-making.[3]

In his review paper on psychology and economics, DellaVigna (2009) suggests that individuals deviate from the standard (economic) model in three respects: nonstandard preferences, nonstandard beliefs, and nonstandard decision-making. Ironically, little of this attention to 'irrationality' has crept into an area where one might have expected it to take hold most strongly, namely in the way we think about households' location decisions. Marsh and Gibb have expressed the same surprise, arguing that the standard economic theory of decision-making under uncertainty − expected utility theory − is quite ill-suited as a basis for understanding housing choices (Marsh and Gibb 2011: 216), a point observed much earlier by Maclennan, who tried (Maclennan 1982).

Marsh and Gibb make a renewed appeal to institutional economics, beginning with Simon's notion of 'bounded rationality' (Simon 1982). They point out how "expected utility theory, as part of the standard economic model, assumes stable and well-defined preferences, considerable knowledge, and sophisticated information processing capabilities on the part of the decision maker" (Marsh and Gibb 2011: 219). Maximization of subjective expected utility, they note, is really only suitable for 'small world' problems, those comprising a limited range of easily identifiable and well-understood prospects. By contrast, housing market decisions, particularly those involving residential mobility, are not 'small world' problems (Marsh and Gibb 2011: 216).

The information requirements of changing residence are high, as are the transactions costs and the cost of getting it wrong. The home is an asset into which the majority of owner–occupier households invest the bulk of their financial *and* social capital, and the decision to move or stay (to sell or not sell) is not one that is taken lightly. Moving involves a complex set of decisions which depart from the simple

[3] The terms 'animal spirits' and 'irrational exuberance' go back to Keynes and Greenspan respectively. Interestingly, both arguments led the authors to develop a case for stronger government intervention in the market.

'small world' problems, where applying rational calculus works best. By contrast, instead of applying rational calculus when faced with complex decisions, such as moving, households will often use rules of thumb or intuition. The fact that very few dwellings are visited by those purchasing them is an example of the heavy filtering that consumers typically apply. Particularly relevant in the residential case is the distinction between a dwelling's use value and its exchange value when it comes to making decisions to sell. The deep personal engagement many owner-occupiers have with their dwelling means that they respond differently to their property's disposal than do traders, and this can carry over into their propensity to move. They treat their property as an endowment and this is a useful segue into prospect theory, whose point of departure from the rational expectations model lies with the fact that people make decisions, such as moving, on the basis of their present level of consumption. Their existing residence therefore becomes their reference point.[4]

Before outlining the argument behind prospect theory it may be useful to introduce the four core concepts used to construct the argument: loss aversion, endowment effect, value function, and reference point. A fifth, the focusing illusion, we consider as an amendment.

Loss aversion refers to the value people impute to their possessions. The use value of the possession is typically greater for the owner than its exchange value. Its relevance to the residential mobility case stems from the fact that ownership/possession generates a change in tastes because people become attached (in most cases) to their dwelling/neighborhood/location. They therefore become averse to its loss, so their choice is strongly biased in favour of the status quo and in favor of small changes rather than large.

The point of reference in any decision to change location is the reference point, the possession which owners are averse to losing. In prospect theory, the reference point is the starting point for any new consumption scenario, because the degree to which any alternative dwelling/neighborhood/location might raise utility is a function of the difference between their current residence and any alternative the individual may consider. One is therefore loss-averse with respect to a particular point of reference.

Loss aversion occurs because people endow what they possess with a use value which they are reluctant to give up. Among owners the use value of the dwelling typically exceeds its exchange value, which in turn means there is a potentially large element of risk in changing residence. Therefore, any gain through trading the possession has to be weighed against a greater psychological loss.

[4] Our implicit reference throughout will be on the owner-occupier, although there are situations in the rental market, especially where location-based supply is tight, where the rights to occupy are jealously guarded and where elements of the endowment also come into play.

The function which links psychological losses (and gains) to dollars received in exchanging the existing dwelling is called the value function. It compares the perceived gains from exchange against the perceived losses. Since, in the owned dwelling case, losses can loom large as a result of endowment effects, the psychological calculus can often favor the decision to stay over the decision to move.

The core driver of prospect theory is the relationship of the proposed change in consumption to the existing level of consumption. The losses people sometimes feel after changing residence have to do with the fact that easily observed and distinctive differences between alternative dwellings/neighborhoods/locations are often given more weight than they turn out to have in reality: for example, the advantage a warmer climate will bring or an extra bedroom. When we compare alternatives, we often focus in on a small handful of these relevant details out of the much larger set of details that are truly important (Kahneman et al. 2006). This is the illusion created by focusing, hence the focusing illusion becomes part of the behavior which prospect theory seeks to address. We now treat these concepts in more detail.

2.1 The endowment effect

According to standard economics, people face indifference curves which describe their willingness to trade off the marginal consumption of one good against another. A common example in the residential case is the trade-off between proximity to the inner city (and jobs) on the one hand and residential space on the other (Alonso 1960). Imagine, for example, that two identical households are arbitrarily assigned to locations R and S so that any two combinations of these 'goods,' accessibility and space, are equally desirable by definition. The households derive the same utility (from this package of 'residential services') at any point on an indifference curve. The convex shape of the indifference curve denotes the diminishing marginal utility, of accessibility on the one hand and residential space on the other.

As Kahneman observes,

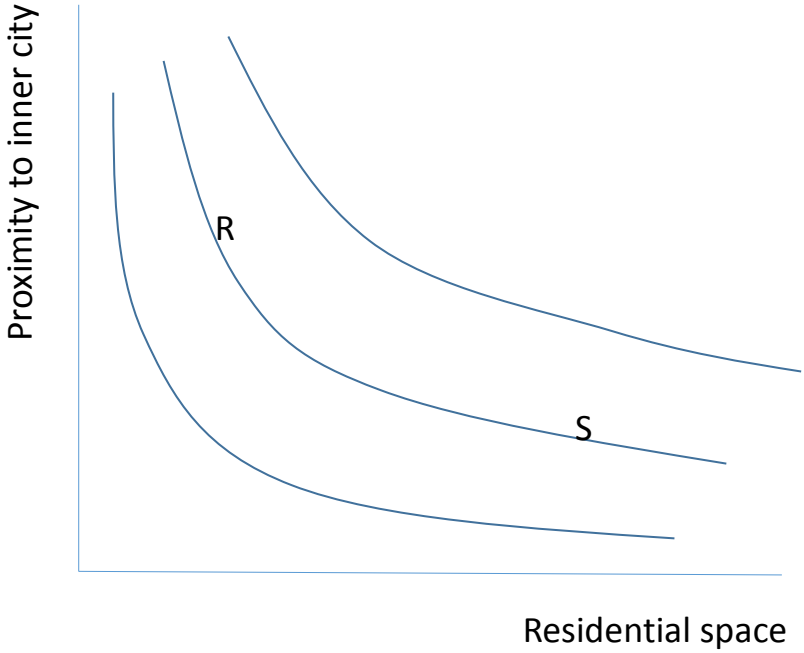
> *Some version of this figure has appeared in every economics textbook written in the last hundred years, and many millions of students have stared at it. Few have noticed what is missing. Here again, the power and elegance of a theoretical model have blinded students and scholars to a serious deficiency* (Kahneman 2011: 290).

Following his exposition of the general case, Kahneman (2011: Figure 11, p. 289) asks us to consider the situation after these households get accustomed to their respective locations, when they are then asked if they are willing to swap places. According to rational expectations theory, the two households would be indifferent to changing location because, by assumption, their preferences (for the implied stream of residential services) are stable over time and they therefore remain on the same indifference curve. However, as time goes by both households become accustomed to their respective locations R and S. In both theory and practice, their continued occupancy generates an endowment which means they will not want to change without compensation for the loss they will experience.

The aversion to changing location now expressed by both households occurs precisely because people's tastes change with occupancy: they become attached to their location, which means they build up an endowment and are therefore averse to moving without compensation. This means they are no longer indifferent to the two locations. The aversion to change resulting from their occupancy of locations R and S implies that choices are strongly biased in favour of the reference situation (Kahneman 2011: 292). Locations R and S have become, in effect, separate reference points for the two households. As Kahneman reminds us, "If you changed… locations, or even considered such a change, you surely remember that the features of the new place were coded as pluses or minuses relative to where you were" (Kahneman 2011: 291).

The implication of the argument based on Figure 1 is that people do not usually think of outcomes in terms of levels of wealth or income, instead they think in terms of the difference between what they have and what they end up with after the choice. Putting it another way, what matters in decision-making is not the absolute level of consumption (utility) people want, but the gain in relation to what they already have. Kahneman goes on to point out how such endowment effects are especially likely in goods that are not regularly traded – like houses. What creates the endowment effect is their use value and this works in favor of the locational status quo. Where use value is not present – for example, among those who simply speculate or trade in houses – endowment effects do not arise.

Figure 1: Historical indifference to residential location



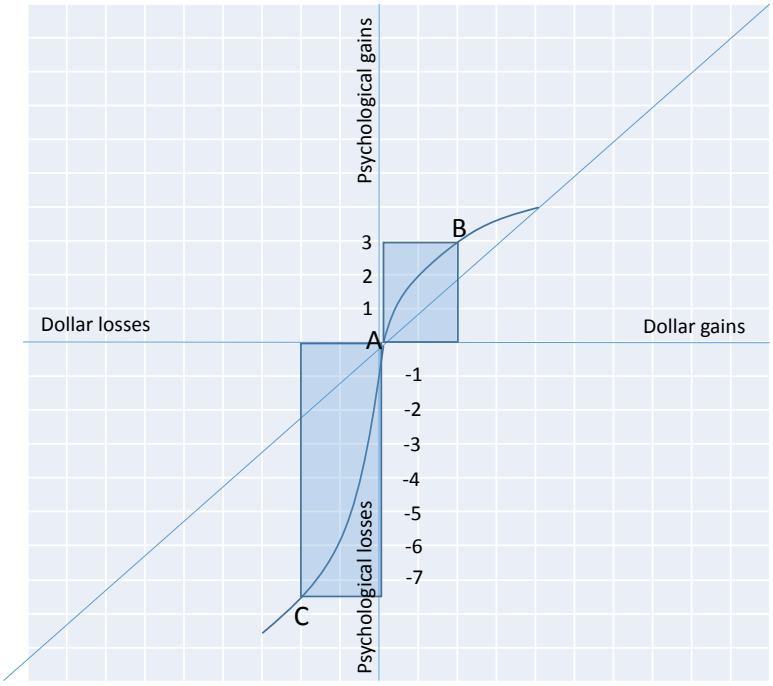
Source: Adapted from Kahneman (2011: 289).

In summary, what Kahneman and colleagues are saying is that possession or occupancy in the housing case creates a wedge between use value and exchange value. As time goes by, people become accustomed to the possession and are unwilling to part with it simply on the basis of its market value. This is because tastes change with occupancy. When considering alternatives, the occupant will use their present reference point, their dwelling, as a basis for evaluating alternatives. In considering what matters is the degree of change in consumption and hence how the alternative compares to the consumer's reference point. It is this argument which is embodied in the value function which sits at the core of prospect theory.

2.2 The value function

At the center of prospect theory is the function that relates the psychological value of the change in consumption to the change in the absolute level of consumption (as measured in dollar terms). The function is nonlinear, implying that changes in dollar (level) terms have a nonequivalent value in psychological terms. When psychological returns, Y, are plotted against dollar returns, X, the points do not lie along the 45 degree line (assuming corresponding metrics) but trace an 'S' shape, as shown in Figure 2.

Figure 2: The value function in prospect theory



Source: After Kahneman (1999: 17).

In Figure 2, A is the reference, the point where the Y and X axes intersect. In the mobility case, A is the current residence. The grid depicts the units in which the respective gains and losses are measured. That part of the 'S' curve to the right of A depicts the satisfaction derived from expected dollar gains from moving: for example, moving to a higher-valued property in a better part of town. However, the curve to the

right of A is concave, implying that there are diminishing marginal psychological returns (ΔY) to each additional unit gain from moving (ΔX). By contrast, the 'S' shape to the left of the reference point, A, is convex, indicating that equivalent dollar losses induce a much greater psychological loss. This loss reflects the endowment effect and these losses are subject to diminishing returns (Carter and McBride 2013).

According to the nonlinear value function in Figure 2, people are more sensitive to losses than they are to gains. Formally, the differential is the ratio of the slopes of the value function at B and C.[5] In the residential case, people will move if the slope at B exceeds the slope at C, for then the psychological (not the dollar) gains exceed the losses. The preference for the status quo we find among stayers is therefore a consequence of loss aversion (Kahneman 2011: 291).

In summary, people make different choices about what is objectively the same outcome depending on where they are coming from − their reference point. To say that two people will make the same choice when faced with the same expected utilities is incorrect because people do not think in terms of absolute levels of consumption but in terms of gains and losses: "utility depends on the history of one's wealth, not only on present wealth" (Kahneman 2011: 277). The essential point for understanding duration of residence is therefore that "a given state can be assigned quite different utilities depending on the state that preceded it, and quite different states can be assigned approximately the same utility if they represent the same change relative to the reference level" (Kahneman, Diener, and Schwarz 1999: 17).

2.3 Implications for mobility theory

The literature on duration of residence and its possible implications for residential mobility and migration stretches back many decades (Morrison 1967). However, the initial studies of duration focused in the main on the overall distribution of durations and principally how previous durations of residence affected the likelihood of moving, as shown in Clark and Huff's 'residence-history tree' (Clark and Huff 1977). The focus was on duration but by implication on subsequent movement: in other words, on leaving the residence (Huff and Clark 1978; Clark and Huff 1977; Goodman 2002; Gordon and Molho 1995; Haurin and Gill 2002). Therefore the early work on duration did not attempt to explain staying.

[5] This differential has been measured on many occasions and the experimental evidence suggests the ratio of the slopes at B and C is approximately 2.5 (3 x 2.5 = 7.5). The coefficient of loss aversion can be estimated, for example, by offering participants a bet on the toss of a coin: they can either lose $10 or win $X. The factor by which X must exceed $10 provides an approximate measure of loss aversion. The median value in a classroom demonstration is rarely far from $25, as reported in Kahneman (1999: 18).

In a more recent consideration, Thomas, Stillwell and Gould (2016) estimate a model of the relationship between duration of residence and plans to move based on unit records of individuals. After controlling for a range of person-specific and contextual covariates, they show how "the predicted probability of planning a residential relocation is found to increase initially with duration of stay, to a peak after 4–5 years, and then to decline as the length of duration increases." They suggest that "an individual's residential duration, as an essential ingredient for the accumulation of social capital and place-based attachment, is critical for informing plans for future (im)mobility" (Thomas, Stillwell, and Gould 2016: 297). The argument can be extended into long-term occupancy in terms of what Fischer and Malmberg (2001) refer to as "location specific insider advantages."

From a prospect theory perspective, this pattern of adaptation to a new residence is exactly what one would expect. In suggesting that the probability of planning a move rises, peaks, then declines, Thomas, Stillwell, and Gould anticipated a literature that has come to be known in human geography as post-move satisfaction (Sloan and Morrison 2016). The adaptation process and timing are similar to those observed on the basis of subjective well-being theory, with the high of moving being followed by an adaption to a lower level of well-being (Nowok et al. 2013). One of the reasons for the adaptation, prospect theory suggests, has to do with the focusing illusion.

2.4 The focusing illusion

The essential difference between prospect theory and the rational expectations model is the latter's explicit recognition of the prior condition (the reference point). People respond, in a nonlinear way, to the attraction of change, the difference between the reference point and the new state, as depicted in Figure 2. In order to empirically identify the psychological impact of a change of residence, Schkade and Kahneman (1998) asked subjects to evaluate the effect of different features of a new location on well-being. More specifically, they asked whether a relocation (of Americans) to California would lead to a higher level of well-being than relocation to the Midwest. A range of different conditions was imposed on decision-makers (in a laboratory setting) in order to understand how people use change as a proxy for an evaluation of the impact of any new residence on their subjective well-being. The resulting concept of focusing illusion helps temper the role of change as outlined in prospect theory.

The focusing illusion refers to the fact that easily observed and distinctive differences between locations are given more weight in decisions relating to change than they will have in reality (Schkade and Kahneman 1998). When people consider the impact of any single factor on their well-being they are prone to exaggerate its

importance. To repeat, when we compare things, we often focus in on a small handful of relevant details out of the much larger set of details that are truly important, hence the illusion generated by focusing (Kahneman et al. 2006). As Schkade and Kahneman (1998) put it, "Nothing in life is quite as important as you think it is while you are thinking about it."[6] The fact that people start thinking of moving again 4−5 years after their previous move is quite consistent with the expected effects of the focusing illusion, because the changes they believed would make a difference often turn out to be less important than initially thought. Whether people actually do move again is a separate issue for, as Kan (1999) has pointed out, the likelihood of moving is highly conditional on longer-term plans. What matters in this instance, however, is the planning, for considering another move is an indicator of changes in well-being following the last move.

In summary, while prospect theory underscores the importance of changes in consumption relative to a reference point, the focusing illusion suggests that the importance of the change may be exaggerated because people focus on those things they expect to change and pay less attention to the things that are going to stay the same. This does not undermine the argument behind prospect theory, but it does explain why subsequent adaptation (at the new residence) can lead to a renewed search a few years later.

2.5 Applying prospect theory

While the shift in thinking which prospect theory brings to the duration of residence phenomena is conceptually appealing, there are challenges associated with its use in understanding the empirical pattern of moves. Mobility has long been viewed as the decision to act on expectations about increases in the levels of residential consumption (Hey and McKenna 1979; Kan 1999; Lu 1999b; Sell and De Jong 1983; Clark and Dieleman 1996; Mulder 2006). There is now a substantial literature relating residential mobility/migration to levels of residential satisfaction (Lu 1998, 1999a) and intentions (DeGroot et al. 2011a; DeGroot, Mulder, and Manting 2011b; Clark and Lisowski 2016) as well as determinants of place attachment (Clark, Duque, and Palomares 2015).

A recent review of prospect theory made the following observation:

[6] Kahneman observes how "an individual may become fixated on the belief that some change will have important consequences for the quality of life, and this belief may then acquire motivating force" (Kahneman 1999: 17). The long-term effects of these changes, however, are relatively small because attention eventually shifts to less novel aspects of daily life (Kahneman et al. 2006: 8).

> *One might be tempted to conclude that, even if prospect theory is an excellent description of behavior in experimental settings, it is less relevant outside the laboratory. In my view this lesson would be incorrect. Rather, the main reason that it has taken so long to apply prospect theory in economics is that… it is hard to know exactly how to apply it. While prospect theory contains many remarkable insights, it is not ready-made for economic applications* (Barberis 2013: 173–4).[7]

The central idea in prospect theory, as Barberis reminds us, is that people derive utility from gains and losses measured relative to a reference point. Barberis suggests it is often unclear how to define precisely what a gain or loss is, not least because Kahneman and Tversky (1979) offered relatively little guidance on how the reference point is to be determined.

Identifying the reference point may be less of a problem in residential mobility decisions than Barberis faced in applying prospect theory to portfolio management. In mobility studies, the reference is the existing residence or rather the existing occupancy. We know that dealers are much more willing to exchange an object they purchase than owners who actually use the good. If we were able to estimate the parameters that govern such status quo bias we expect this would play a role in understanding the distribution of durations of residence and possibly not just of homeowners. To our knowledge there has been no rigorous attempt to test for endowment effects in the residential mobility context, although there is a strong a priori supposition that they exist.

Barberis speculated that, ten years from now, prospect theory's visibility may well match or exceed its visibility in finance (Barberis 2013: 192). In fact, earlier applications to seller behavior in the housing market had already brought prospect theory to bear on the decision to stay or move, but in a housing market rather than a residential mobility context (Genesove and Mayer 2001). Using sales data from downtown Boston in the 1990s, Genesove and Mayer showed how loss aversion determined seller behavior in the housing market. Condominium owners subject to nominal losses set higher asking prices, attained higher selling prices, and exhibited a much lower sale hazard than other sellers (Genesove and Mayer 2001).[8] As they point

[7] Barberis goes on, "until a few years ago, the only significant applications of prospect theory outside finance and insurance were the endowment work and the work on the labour supply of cab drivers − a remarkably short list, and one that can be criticized: the endowment effect for being 'only' an experimental finding, and the work on labour supply for being relevant to a potentially narrow segment of the working population" (Barberis 2013: 191).

[8] Owners' estimates of their home's exchange value typically exceed those of the market, leading to both a longer time to sell and a higher probability of not selling and therefore staying (Chan 2001; Genesove and Mayer 2001).

out, "prospect theory does not directly address the setting in which an individual chooses whether or not to sell an asset such as a house, but subsequent papers have predicted that the decline in utility that comes from realizing losses relative to gains will lead investors to hold their losses longer than their winners, even if the losers have a lower subsequent expected gain" (Genesove and Mayer 2001: 1237). By contrast, rational expectations models largely ignore the loss function and frame the mobility response entirely on the expected gains. What the presence of the endowment effect implies is that there is a potentially large element of risk in any residential change, a feature that contributes to the level of stress that moving engenders (Bhugra 2004; Oishi and Talhelm 2012).

Although not elaborated as prospect theory, several mobility studies have nevertheless recognized the role of risk aversion. Most of the empirical evidence on risk aversion as it relates to migration is indirect. Daveri and Faini (1999), for example, examine how income variability and the correlation of income between regions in Italy affect migration probabilities, and their results are consistent with the hypothesis that risk aversion heavily influences migration probabilities. Much earlier on, Smith attempted to explicitly introduce risk into models of migration, noting the regional differentiation that occurs "when the characteristic undergoing spatial selection is some measure of risk aversion" (Smith 1979a: 31). Smith also offered some of the first thinking about the way in which duration might be linked to risk aversion (Smith 1979b). He suggested, for example, that duration of staying could be used to understand the overall relationship between aggregate staying and a population's risk aversion. The probability of relocation, he argued, decreases as risk aversion increases and the assumption of risk neutrality is more appropriately replaced by some measure of risk aversion.

In another 1970s paper, David showed how individual variations in the degree of risk aversion enter into a decision-making model of migration and can generate several of the well-known properties of migration streams (David 1976). Considerably later, Heitmueller posited a model in which risk-averse individuals are less likely to migrate (Heitmueller 2005). But, as in the case of Harris and Todaro (1970), Heitmueller was thinking in terms of expected returns (the interaction of unemployment benefits and personal proxies for risk aversion), using data on migration between eastern and western members of the European Union. As such, the focus remained on potential new levels of consumption rather than on the change in residence with an explicit role for the reference point.

While issues of risk and mobility are receiving growing attention in the mobility literature (e.g., Bauernschulster et al. 2014), almost all empirical studies which attempt to incorporate risk do so using proxies, as captured in responses to questions on hypothetical actions or responses to hypothetical investment decisions. While they may

(or may) not be transferable measures either across realms or over time, these proxies have no observable reference point. They make the same ahistorical assumptions that rational expectations models do. In terms of Figure 2, their conceptual horizons sit above the X axis on gains, and they make no attempt to measure the psychological losses implied by decisions which take place below the X axis.

A separate but relevant feature which prospect theory raises is the role not just of risk aversion but of the differences between people in their level of risk aversion. We can think, for example, of two people with the same reference point who are differentially risk-averse. People's sensitivity to risk, as a psychological trait, and the shape of the loss function are two quite different measurements and can potentially operate independently of one another. As such their effect can also be additive, with personal variations in levels of risk aversion exaggerating the endowment effect.

In one of the few attempts to empirically examine the relationship between migration and attitudes to risk, Jaeger et al. (2010) show that being relatively willing to take risks is associated with an increase of at least 1.6 percentage points in the probability of ever migrating in the period 2000−2005 (Jaeger et al. 2010), a substantial effect relative to the unconditional migration propensity of 5.1 percent in their example. A parallel paper proposed a link between risk aversion and the size of networks, migrant characteristics, and the timing of migration: as the size of the network at the destination increases over time, so employment at the destination becomes less uncertain, which induces more risk-averse individuals to migrate (Umblijs 2012).

In summary, although the way people view risk has been recognized as being relevant by those studying migration (e.g., Hart 1975; David 1976), only a few have been able to actually incorporate respondents' own measures of risk aversion into models of migration.

3. Discussion

Prospect theory has the potential to give us additional insight into mobility, migration, and the role of duration of owner-occupancy. Its contribution lies in introducing a value function that links psychological returns to changes in consumption. As far as we are aware, studies of mobility have eschewed any attempts to measure or assess the empirical implications of the value function. By contrast, the rational expectations model avoids any engagement with the psychological dimension by assuming that decision utility equals experienced utility − that higher levels of consumption raise utility regardless of the consumer's reference point.

Any application of prospect theory to the empirical study of mobility is likely to require two additions to questions in panel data sets. The first is a carefully specified set

of questions designed to establish an individual's reference point (their level of residential consumption at a given time, t). This reference point needs to be measured at each successive interview, given ongoing changes in family, economic, and related circumstances. Associated questions on expected alternative levels of residential consumption will also be necessary to contrast to the reference point.

The second requirement will be a set of questions which establish the resident's level of risk aversion. Several panel surveys currently carry questions on attitudes to financial risk, but they are usually very general questions and relate for the most part to purely financial gains and losses. There is clearly room for their modification to suit the residential context. The few studies that have actually estimated the effect of risk preferences have done so with respect to domains other than migration. Marriage and fertility are two examples. We have learned, for example, that highly risk-tolerant women are more likely to delay marriage (Schmidt 2008) and that the probability of divorce also increases with relative risk tolerance because risk-averse individuals require compensation for the additional risk that is inherent in divorce (Light and Ahn 2010).

These last two examples from marriage decisions are particularly apposite because it is not simply a question of staying in a dwelling but often of also staying in an existing relationship with a partner or in an existing household or local community, for in many cases they come bundled with the residence. The risks of moving (and hence the gains through staying) are multiplied in situations where assets of several kinds are present. In one example, Kulu and Steele use rich longitudinal register data from Finland to apply multilevel event-history analysis to the occurrence of multiple births and housing changes over the life course (Kulu and Steele 2013). They model the risk of moving relative to the time since the birth of children and the hazard of births relative to the duration in the current house. The implication of their work is that modeling the decision to stay or move requires an explicit measure of the way residents view risk in the wider context.

4. Conclusions

Implicit in the application of the rational expectations model to mobility is the assumption that people move because net gains are expected to be positive. This seems logical by definition, but only because experienced utility is inferred from decision utility. The contribution of prospect theory lies in exposing their nonequivalence. Psychological returns do not equate to difference in levels of consumption; instead they respond to change relative to a starting or reference point. Obviously, an increase of $100 for someone on $1,000 is quite different to an increase of $100 for someone on

$100,000. The starting point matters. And the starting point, the reference point, reflects tastes. In the residential case, tastes are not constant or uniform but are altered by the very fact of occupancy. Occupancy generates endowment, and in prospect theory it is this endowment which encourages people to favour the status quo, which typically means longer durations of residence.

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