The Role of Attitudes Towards Risk in the Decision to Migrate

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Geographic mobility plays a key role in the process of development in most low-income countries. This is especially true in Mexico, whose border with the US has the largest flow of migrants in contemporary world. Developing a good understanding of the socio-economic determinants of migration decisions has proved to be extremely difficult. This paper examines the role that attitudes towards risk play in the decision to move.

A simple model of migration suggests that individuals will migrate if their expected utility in a new location is higher than it would be in the current location. Equating expected utility with expected income, there is a long literature which suggests that individuals living in rural villages will migrate to more urban areas where expected incomes are higher (Todaro 1969). It has been argued that raising rural incomes will reduce rural to urban migration. However, potential migrants are likely to consider the variability of income in the destination as well. Indeed, if income is more variable in rural areas, people will move away from these places to urban areas even if there is no income differential (Stark 1981, Stark and Levhari 1982). This paper contributes to the latter trend in the literature by analyzing how attitudes toward risk influence the decision to migrate. Using data especially collected for this purpose, I use direct measures of risk aversion and relate them to individual and family choices regarding location.

1. Theoretical Background

Faced with uncertainty, an individual's maximization of his expected utility would be consistent with maximizing expected income (consumption) only if he is risk neutral. However, if he is risk averse, then he will be willing to trade off expected income for lower variability. If there are no formal mechanisms of insurance available to this individual—as it is often the case in rural communities in developing countries—, he could migrate to another community with lower income volatility, possibly even to one with lower expected income. Thus, a hypothesis derived from this theory is that we should observe people with higher degrees of risk aversion located in places where income has low variance, and the opposite for people with higher risk tolerance. It can be argued, however, that the initial risks of migration are so high that risk-averse people would not engage in it. In that case, the hypothesis would be reversed[1].

Alternatively, it could be that the decision to migrate is made by the household instead of the individual. If families[2] pool resources, they could reduce their risk exposure by diversifying their income sources. One way to do this consists in sending one or more of its members to work at a different location where income has negative or no correlation with the origin community. The migrant would then send remittances to his family when their income is low and the family would support the migrant while he is unemployed. In this case, the relevant measure of risk aversion would be that pertaining to the household as a whole rather than to any particular member. A second testable hypothesis follows: In

[1] Notice, however, that the reason to migrate would be quite different. In this second case, expected income at the destination community would have to be higher than that at the origin.

[2] I will use the words "household" and "family" interchangeably. However, the household is the relevant unit of analysis.

the absence of formal mechanisms of insurance, *ceteris paribus*, households with lower tolerance to risk should be more willing to diversify their income sources by having a larger number of their members migrate to communities with negative or little correlation of income with respect to the community of origin. Further, migrants' individual degrees of risk aversion should be irrelevant once the family's risk aversion has been taken into account. Rosenzweig and Stark (1989) test the hypothesis that families use migration as a means to mitigate risks in the context of marriage markets in rural India and find positive results. Their test, however, has one problem: It relies on the implicit assumption that all the sampled households have the same degree of risk aversion. This paper relaxes that assumption by including direct measures of individual risk aversion which allow us to test the validity of such assumption. In addition, the paper uses extremely detailed longitudinal data on several socioeconomic and demographic outcomes. The characteristics of these data are explained below.

2. Data Sources

I use data from the 2002 and 2005 waves of the Mexican Family Life Survey (MxFLS[3]) which is a longitudinal survey of over 38,000 individuals collecting extremely detailed information on the social, demographic, and economic characteristics of respondents, their households, and their communities. The survey includes information on migrant networks and exhaustive individual migration histories stretching back to age 12. Moreover, the 2005 wave follows all 2002-wave respondents who have moved within Mexico or to the United States. This unprecedented effort has not only allowed MxFLS to attain extremely low attrition rates but it also makes it perfectly suited for analyzing the migration phenomenon. On top of this, the second wave includes a new module on preferences. Among such preferences, it measures a person's degree of risk aversion by successively asking participants to choose between two binary gambles: One with a sure payoff (a risk-free gamble), and one with a high and a low payoff (equally likely) and an expected value higher than the risk-free gamble. Successive choices present participants with the same risk-free gamble and a binary gamble that has higher expected value every time, but also higher variance. The different choices are presented to the participant until she opts for the safe option, thus indicating her maximum tolerance to risk.

Additionally, a subsample of approximately 600 rural households of the 2005-wave participants was invited to participate in MxFLS-Preferences Project (MxFLS-PP)[4]. This innovative project worked in collaboration with MxFLS to obtain experimental measures of preferences and link them to all the survey data. Experimental measures of individual preferences are commonly regarded to be more reliable than survey measures because they utilize financial incentives that make it costly for participants not to reveal their true preferences. In a typical economic experiment, a subject chooses the way in which she will get paid and hence, by doing what she considers to be best for herself, reveals information about her preferences. MxFLS-PP obtained experimental measures of various preferences, financial risk aversion among them. It also conducted an additional survey to capture expectations, and pro-social attitudes.

[3] In Spanish called Encuesta Nacional sobre el Nivel de Vida de los Hogares (ENNViH).

[4] MxFLS-PP's principal investigators are professors Duncan Thomas (UCLA), Joseph Hotz (UCLA), Catherine Eckel (Virginia Tech), Graciela Teruel (Universidad Iberoamericana, Mexico), Luis Rubalcava (CIDE, Mexico), and Susan Parker (CIDE, Mexico). Professors Duncan Thomas, Graciela Teruel, and Luis Rubalcava are also principal investigators of MxFLS.

The instrument employed to measure risk aversion offers six binary gambles to the subject. As before, each gamble has two payoffs that are equally likely, one is low and the other is high. One of the gambles has two equal payoffs (risk-free gamble) and the rest have increasingly higher expected values and variances. Each participant chooses the gamble that she would like to play and then a coin is tossed to determine the payoff that she receives. None of the gambles involves any losses; in the worst case, they only earn a minimum positive amount. Participants' decisions are kept strictly confidential and when they consent to participate they are told their participation is absolutely voluntary at all times. This instrument has been used widely by the experimental economics literature and has been found to be internally valid—that is, it is consistent when applied in different occasions to the same subjects and yields similar results when applied to different subject pools.

I use this measure of risk aversion as the cornerstone of my analysis. I use it to construct a series of variables measuring relative tolerance to risk and compare them to similar variables constructed from the survey measures. These variables seem to correlate well, which allows me to extend my analysis to the whole MxFLS sample using only the measures included in the preferences section. This step is in itself an important contribution to the social sciences as it provides evidence that survey measures of individual preferences are reliable. Furthermore, the use of MxFLS allows me to provide external validity to these measures, a work that to the best of my knowledge has not been carried out before.

3. Analytical Strategy and Preliminary Results

In this paper I use the migration histories section of MxFLS 2002 and 2005, which contains not only a list of all the migration episodes of each MxFLS respondent since age 12 but also the date and age at which they were started, their length, distance traveled, characteristics of the destination (rural/urban), reasons why the person moved, and persons who accompanied the migrant, among other variables. From these migration histories I construct several dependent variables: whether a person has ever migrated, whether a person has ever migrated for certain specific reasons—e.g. work, marriage, education—, and whether the person migrated within his municipality, state, and country.
As independent variables I construct several flexible measures of risk-aversion: the coefficient of variation of the chosen gamble, a dummy variable indicating if the respondent chose one of the two riskiest gambles, and another dummy indicating if the person chose the risk-free gamble. I then estimate Linear Probability Models including these measures of risk aversion and a series of controls which include sex, age, and education.
In a second step of the analysis I include a measure of the income variability differential between the place of origin and destination.

To test the second hypothesis that *households with lower tolerance to risk should be more willing to diversify their income sources by having a larger number of their members migrate to communities with negative or little correlation of income with respect to the community of origin* I will generate two measures of 'family risk aversion': The first will be equal to the head of household's degree of risk aversion, which is consistent with the idea that household members have common preferences or that the head of household is

the only decision maker; the second measure will be the mean risk aversion of the adult members of the household, which corresponds roughly to the idea of a bargained decision making within the household. Then I will run the household's proportion of members who have migrated and actively send money to—or receive it from—the household on the household's degree of risk aversion and the abovementioned controls. If the hypothesis is true, the coefficient accompanying this variable should be statistically significant and positive. A final test will be to run, at the individual level, the binary migration variable on the individual's degree of risk aversion but controlling for family fixed effects. If the second hypothesis holds, individual degrees of risk aversion should not be statistically significant.

Preliminary results from the estimation of simple linear probability models show men are significantly more likely to migrate for reasons related to education and to their own work (mostly, to look for a job) while women are more likely to migrate motivated by marriage and their spouse's job. Men are also more likely to migrate outside of Mexico.
Regarding risk preferences, there seems to be a positive relation between a person's degree of risk aversion and the likelihood of migrating, especially when the motivations are to be closer to the family, marriage, or the spouse's job. These very preliminary results must be taken with caution but they suggest that the people who migrate for these reasons are risk averse, which is consistent with the story that they prefer to be with their families and so are forced to move to follow them wherever they are.
These preliminary results also show a positive relation between risk aversion and the probability to migrate outside of Mexico, implying that the more risk-averse people are those migrating to the US. Several hypotheses emerge from this: One the one hand, it could be the case that migrating abroad is seen as a way to ensure a stable source of income. However, this type of migration can entail high physical risks, as testified by the stories of thousands of people migrating illegally from Mexico to the US. In that case, the people who migrate under these conditions, although having a *high degree of financial* risk aversion, should have a *low degree of physical* risk aversion. To test this hypothesis, I look at MxFLS-PP survey questions aimed at measuring this dimension of risk aversion. Preliminary results show, however, that there is also a positive relation with a coarse indicator of physical risk aversion and the probability to migrate outside of Mexico.
These results could then be owed, on the other hand, to one of two reasons. First, it could be that most people in the sample who have migrated abroad have done so under fairly safe conditions—networks could play a significant role in this sense. Second, since I use migration histories (implying that the measures of risk aversion were taken *after* the migration spells had occurred), it could be that people's attitudes toward risk have changed as a result of their migrating experience. The latter explanation opens the possibility of preferences being endogenous, a phenomenon that has so far been unexplored by the economic science.

Taking advantage of the unprecedented dataset this paper is based on, it will continue work on these preliminary results by including more control variables and making the analysis not only at the individual level but also at the family and migration event levels. It will also explore the hypotheses put forth above more deeply to shed some light on the largely unexplored relation between risk aversion and migration, a deficiency due to the paucity of appropriate data.

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