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Intra-household labor supply, migration, and subsistence constraints in a risky environment: Evidence from rural El Salvador[☆]

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ABSTRACT

We investigate the use of intra-household labor allocation as a means of risk coping when subsistence constraints matter in rural El Salvador. We show that households increase the labor supply of its male members to the family farm and abroad in the US after being subjected to adverse agricultural productivity shocks. The latter is the result of a standard substitution effect, whereas the former is the result of subsistence concerns. Theoretically, these results are not at odds with each other if these events differentially impacted rich and poor households. We also show that the earthquakes of 2001 resulted in large reductions in the number of female members who were sent abroad and large increases in hours of domestic labor supplied by female members. We argue that this result is a consequence of subsistence motives because female labor supply at home increased despite lower remuneration.

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There are districts in which the position of the rural population is that of a man standing permanently up to the neck in water, so that even a ripple is sufficient to drown him. Tawney (1966)¹

1. Introduction

Households in less-developed countries (LDCs) often times live very close to the subsistence level and, at the same time, face a large degree of uninsured risk. In such an environment, an adverse shock such as a loss of livestock or harvest can be devastating. Because of the gravity of such events, households often are forced to rely on a menu of risk coping strategies to buffer the event's impact. One of the most readily available risk coping mechanisms is adjusting labor supply. In the most straightforward case, households will respond to an adverse productivity shock in a given sector by substituting towards a sector where their labor is relatively more expensive. In the presence of frictions, however, this may not be possible. For example, there may be rigidities in local labor markets. However, even if well functioning labor markets are accessible, these markets may not be nearby and so there will be transaction costs that must be paid to access them. In this scenario, the response of labor supply to adverse events may not accord with neoclassical theory. In particular, households may *increase* labor supply despite *lower* remuneration simply to keep their heads above water. In either scenario, the use of labor supply is an example of a “non-market” risk management mechanism.

[☆] This is a substantially revised version of an earlier paper titled, “Migration, Risk, and the Intra-Household Allocation of Labor in El Salvador.”

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¹ This quote from *Land and Labor in China* opens James C. Scott's 1976 book *The Moral Economy of the Peasant*.

There is a large literature in Development Economics on the use of such “non-market” mechanisms.² Part of this literature has looked at the importance of migration as both an *ex post* risk management strategy (e.g. Halliday, 2006; Yang and Choi, 2007; Pajaron, 2011) and an *ex ante* strategy (e.g. Paulson, 2000; Rosenzweig and Stark, 1989). However, while substantial attention has been paid to migration, the use of other aspects of the intra-household allocation of labor, such as hours devoted to farming or domestic labors, has largely been ignored.

In this paper, we fill this void by developing and empirically testing a model of intra-household labor supply as an *ex post* risk coping strategy when subsistence constraints matter and when there may be productivity differences across household members. We test the model using panel data on rural households from El Salvador.³ Specifically, we consider three key aspects of intra-household labor supply: labor supplied abroad, labor supplied to the household farm, and labor supplied to domestic duties. Besides contributing to the literature on risk management in LDC's, this work also adds to a fairly extensive but controversial literature on backwards bending labor supply in the presence of subsistence constraints in poorer countries (e.g. Barzel and McDonald, 1973; Scott, 1976; Frankenberg et al., 2003; Edmonds, 2005; Jayachandran, 2006; Bhalotra, 2007, 2010). Finally, this work further highlights the endogeneity of household composition which motivates the need to move beyond exogenous sharing rules in models of intra-household bargaining as in Basu (2006).

Our results paint an intricate picture of how Salvadoran households manage risk. In response to the earthquakes of 2001, we show that households allocated more labor to domestic duties and less labor abroad. We adopt the stance that the earthquakes *reduced* the marginal returns to labor at home. For example, it is not hard to argue that preparing a meal at home is more difficult when your kitchen is in disarray. As such, we provide evidence that subsistence was the overarching motive behind the household's response to the earthquakes since labor supplied at home increased despite lower remuneration. In response to agricultural productivity shocks, however, matters are somewhat different. We show that households increased the number of migrants residing abroad as well as hours devoted to agricultural activities at home. Unlike the case of the earthquakes, this juxtaposition of subsistence and substitution effects is seemingly inconsistent with our model since, in it, we show that the household's response to a given shock can be motivated either by subsistence concerns or by substitution concerns, but not both. However, if one adopts a more nuanced view of our results, it is still possible to reconcile these findings with theory. Regardless, empirically, we show that backwards bending labor supply is an important aspect of the household's menu of risk coping mechanisms.

Our findings have an interesting relationship to Kochar (1999) who shows that Indian households are able to smooth consumption by working more off the farm in response to adverse productivity shocks. The increase in farm hours in response to lower productivity that we observe does not suggest that the local Salvadoran labor market is useful for insuring adverse shocks. If household members were able to freely adjust hours off-farm in response to the vagaries of farm income as in Kochar (1999), then we would not see the backwards bending labor supply that we observed.⁴ This points towards a limited ability of the local labor market to help insure risk.⁵

Finally, productivity differences are a crucial aspect of how the household manages risk. In the data, we show a clear and somewhat common division of labor in which men tend to work on the farms and abroad, whereas women tend to work at home. We presume that, at least partially, this reflects underlying productivity differentials.⁶ Theoretically, when some genders supply positive labor to a given sector and others do not, small productivity changes in that sector will affect the gender who is at an interior solution. Consistent with this, we show that the earthquakes exclusively affected female labor supply at home, but that agricultural shocks predominately affected male labor supply on the farm and abroad.

The balance of this paper is organized as follows. In the next section, we discuss the model. In the two subsequent sections, we discuss our data and empirical findings. Finally, we conclude.

2. Theory

2.1. Primitives

We construct a model of migration and intra-household labor supply as a means of *ex post* risk management in the presence of transactions costs and subsistence constraints. There are two time periods: $t \in \{1, 2\}$. The household is endowed with a measure of labor of size one which can be allocated to working on the farm (L_t for $t \in \{1, 2\}$), working

² Some common examples include transferring funds within villages or families (Townsend, 1994; Udry, 1994a; Yang and Choi, 2007; Pajaron, 2011), depleting assets (Paxson, 1992; Rosenzweig and Wolpin, 1993; Udry, 1994b), increasing the labor supply (Kochar, 1999), adding household members (Frankenberg et al., 2003), and migrating (Rosenzweig and Stark, 1989; Paulson, 2000; Halliday, 2006). For a comprehensive survey of this literature, we refer the reader to Besley (1995).

³ El Salvador is a good setting for this study due to the important role that migration plays in that country. According to the 2010 US Census, the population of the US that was born in El Salvador was about 1.2 million in 2009 (Acosta and de la Cruz, 2011). This makes Salvadorans the second most prevalent immigrant group from Latin America residing in the US after Mexicans. This is especially remarkable given that El Salvador's population was estimated to be 7.2 million in 2009.

⁴ If the household could freely work off-farm at a wage w , then labor would be supplied on the farm until $Af'(L) = w$. If $f(\cdot)$ satisfies standard assumptions, then reduced farm productivity will unequivocally lower farm labor.

⁵ In an earlier version of the paper, we investigated whether or not labor off-farm in El Salvador responded to adverse productivity shocks on the farm. We provided no evidence that it did.

⁶ We are careful not to attribute all of these differences to productivity differences, but we do believe that they play some role.

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