Paper/Poster Title	Paper/Poster Title

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Abstract	200 words max

This paper presents evidence of misallocation across households in rural Indian agriculture. I show that household demographics predict own farm labor demand for smallholder farmers but not non-smallholder farmers. A simple model of labor allocation predicts a clear consequence of this duality: smallholder farmers will reallocate labor across plots less in response to price changes than non-smallholders. Detailed household panel data confirms this theoretical prediction. Three additional facts suggest that a lack of off-farm labor opportunities may be partly responsible for the behavior of smallholders, leading smallholders to overallocate labor to agricultural production. First, smallholders report fewer hours of involuntary unemployment when own crop prices increase. Second, yield is substantially higher for smallholders on plots of the same size. Finally, estimated marginal revenue products of labor are consistently lower for smallholders.

Keywords	misallocation, markets, market failures, agriculture, labor
JEL Code	D24, J20, J43, O13, Q12, Q13, Q15, Q18, Q24 see: www.aeaweb.org/jel/guide/jel.php?class=Q)

Introduction

100 – 250 words

An important feature of agricultural households is that they are both producers and consumers of the same good. This feature is described in the classical agricultural house- hold model (Singh et al., 1986). In the canonical model under common assumptions, production and consumption decisions are separable. In other words, households are able to first make production decisions to maximize profits and then make consumption decisions. Importantly, this implies that production decisions are independent of consumption decisions and, thus, that household consumption preferences do not affect production decisions.

However, incomplete markets have additional implications for agricultural production, as well. A simple model of labor allocation makes a clear prediction: households for which markets fail will reallocate labor less in response to crop price changes than will households for which markets are complete. To test this prediction, I implement Benjamin's basic test for market completeness in India and split the sample based on one variable possibly correlated with market completeness: landholdings.

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Methodology	*100 – 250 words*

This paper uses ICRISAT's Village Dynamics in South Asia (VDSA) data (http://vdsa.icrisat.ac.in/vdsa-index.htm). ICRISAT has been collecting longitudinal data in India for several decades, but I use the most recent longitudinal data, which spans the years 2010 to 2014. My final sample comprises 1,089 different households across 17 districts in 8 different states. Importantly, the data contains monthly-level information on labor and resource allocation across agricultural plots for the entire five years of the panel. Data is collected monthly, so recall is minimized. In addition, the village data collects information on individual crop prices relevant for local farmers, also at monthly intervals, which plays an important role in the empirical strategy I employ. Finally, five separate years of data remove some concerns regarding the heterogeneity of effects when populations are subject to aggregate shocks (Rosenzweig and Udry, 2020).

This paper approaches the question of separation and complete markets in several ways, making use of the rich panel data. Since I use household-level fixed effects, all regressions cluster standard errors at the household level unless otherwise reported. First, I borrow specifications from prior literature and analyze whether household demographics predict farm-level labor demand (Benjamin, 1992; Dillon and Barrett, 2017; Dillon et al., 2019; LaFave and Thomas, 2016). I diverge from the prior literature in two key ways. First, five years of panel data allow me to employ fixed effects at much lower levels of aggregation than other literature. In particular, I am able to estimate regressions using household- plot-crop fixed effects, which restricts attention only to plots planted with the same crop in multiple years. Second, much of the previous literature has used data from Africa (Dillon and Barrett, 2017; Dillon et al., 2019) or Indonesia (Benjamin, 1992; LaFave and Thomas, 2016), whereas the ICRISAT VDSA data was collected in India.

Results	*100 – 250 words*

I find evidence of misallocation across landholding size, as I am unable to reject recursion for non-smallholders, but strongly reject recursion for smallholders. Additional results confirm the theoretical prediction of this differential behavior: smallholder farmers reallocate labor across plots in response to price changes less than do non-smallholder. In other words, non-smallholders appear to be able to take better advantage of new information – conveyed through local crop prices – than smallholders, leading non-smallholders to more efficiently allocate labor throughout the agricultural season. This relationship is driven by the fact that non-smallholders can treat individual plots separately, as if they were separate firms, while smallholders cannot due to the failure of recursion; they equate MRPLs across plots with one another, not with the market wage, which leads to reallocation of labor from one plot to another and blunts the labor reallocation effects of price changes. This is consistent with recent evidence of

substantial differences in production responses across different household and firm types in developing countries (Hardy and Kagy, 2020).

Discussion and Conclusion	*100 – 250 words*

An important remaining question is what the source of this misallocation is. Additional analyses present suggestive evidence that a lack of off-farm wage opportunities may be responsible. First, an (unexpected) increase in crop price induces smallholders to report lower levels of involuntary unemployment but does not affect their allocation to wage employment. This is consistent with a story in which a decrease in crop prices leads smallholders to reallocate time to (unsuccessfully) search for off-farm wage labor. Impor- tantly, non-smallholders do not reallocate labor in a similar way in response to changes in crop prices; the coefficients are not only insignificant but also small in magnitude. Second, output per hectare is much higher on smallholder plots than non-smallholder plots, even for plots of the same size. In other words, it appears that smallholders are more intensively farming their plots than are non-smallholders, which is consistent with a lack of wage opportunities but inconsistent with a lack of credit preventing smallholders from hiring in additional labor.1 Finally, I calculate MRPL from naïve production function estimates, identified with fixed effects, and find that MRPL estimates are much higher for non-smallholders than for smallholders. In particular, the median is 52 percent higher and the mean is 71 percent higher, indicating an overallocation of labor to agricultural production for smallholders. As prima facie evidence of face validity for these MRPL calculations, the median hourly MRPL for non-smallholders is around one-ninth the reported daily agricultural wage. Since non-smallholders hire in labor for agricultural production, the lack of off-farm wage opportunities does not appear to lead to substantial deviations from the predicted equality of MRPL and the market wage for this subsample of households.