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Determinants of smallholder farmers' livelihood trajectories. Evidence from rural Malawi

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ABSTRACT

This paper examines the determinants of livelihood trajectories of households surveyed in rural Malawi in 2007 that were tracked in 2018. Using a set of indicators, including income source diversification and participation in social assistance programmes, households were placed in different trajectories, namely, dropping out, stepping up, hanging in and stepping in. A multinomial logit model was used to analyse factors explaining placement in a livelihood trajectory. We find that the explanatory factors are not the same for farmers in different pathways. The stepping-up of households is likely with increasing commercialization and significant asset accumulation. Furthermore, the stepping-in trajectory is constrained by initial land holding sizes but is more likely if a household has had experience with the cultivation of several different kinds of crops. We find that crop diversification reduces the chance of dropping out but also increases the possibility of hanging in, implying that the blanket recommendation to farmers to diversify crop production may not attain the same benefits to all farmers. This may well be complemented with useful extension services, especially for young farming households. Overall, the study findings point to the complexity and the need for context-dependent development approaches to provide sustainable escapes from poverty.

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Longitudinal study; livelihood trajectories; commercialisation; Malawi

1. Introduction

Agriculture remains the main livelihood strategy for many people in low- and middle-income countries (LMICs). In Africa, 40 percent of rural self-employment time is in self-employed farming (AGRA 2019). Over 70 percent of Malawians realise their incomes from agricultural activities (NSO 2020). Transforming agriculture to address persistent low productivity traps among smallholders and increasing market orientation is therefore key for improving livelihoods. In particular, evidence suggests positive outcomes from farmers' engagement with markets in terms of income, reduced poverty and various degrees of food and nutrition security (Awotide et al. 2016; Carletto et al. 2017; Ogutu and Qaim 2019; Radchenko and Corral 2018). Hence, governments invest in interventions that integrate smallholder farmers into markets. Such interventions include, but are not limited to, those aimed at increasing market surplus and strengthening marketing channels.

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According to Dorward (2009) and Xu et al. (2015), households' livelihoods are in constant flux with changes over time in response to their level of productivity and incomes. While some households may experience increased livelihood productivity and incomes, others fail to succeed or experience a decline (Dorward 2009; Mushongah 2009). For households engaged in agriculture, increasing productivity and the extent of commercialisation may propel households on a development path that changes their livelihood activities and welfare outcomes. However, little is known about the role of smallholder agricultural commercialisation in observed livelihood trajectories over time, let alone the factors that shape these pathways. This is mainly because longitudinal data are required to study such change processes (Bagchi et al. 1998; Mushongah and Scoones 2012; Sabates-wheeler et al. 2018). Only a few studies have addressed the question of what determines livelihood trajectories using longitudinal data. For instance, Mushongah (2009), in his study of livelihood changes over 20 years in Zimbabwe, finds that household engagement in low return activities coupled with shocks and stresses resulted in many merely surviving in their livelihoods. Other studies (Adger et al. 2002; Babulo et al. 2008; Brown et al. 2006; Pritchard et al. 2017) have identified livelihood strategies adopted by households in different contexts but fail to explicitly link livelihood trajectories to the role of commercialisation over time. There have been, however, studies on smallholder commercialisation in different contexts focusing on the determinants and their impacts (Abdullah Rabbi et al. 2019; Carletto et al. 2017; Ogutu and Qaim 2019).

To address this knowledge gap, this study operationalises the development framework by Dorward (2009) and later modified by Mushongah (2009) using quantitative methods to investigate determinants of livelihood trajectories in the context of smallholder commercialisation. Specifically, we assess how commercialisation, defined in this study by the proportion of crop sales out of total production, influences livelihood trajectories. We hypothesise that households that are more commercialised are more likely to expand their investments in agriculture and/or take up livelihoods outside of agriculture. Furthermore, different household characteristics influence the prevailing livelihood trajectory differently, with initial conditions such as asset holdings of households being important in livelihood pathways. Knowledge of such factors that influence each livelihood trajectory is important to inform policies that target different segments of society to avoid a "one size fits all" strategy. This paper draws on primary evidence from household surveys conducted over a span of 10 years in the Mchinji and Ntchisi districts in rural Malawi.

2. Brief review of the literature on livelihood trajectories

Within the development discourse, the sustainable livelihoods approach has helped to bring afore the complexities of how people secure the necessities of life through their livelihoods. Livelihoods encompass how people use their capabilities and means of living to secure food, income, and assets (Mclean 2015). Using these resources, households may adopt different livelihood strategies or their combinations, such as farm or nonfarm, migration, remittances, wage employment or self-employment, in pursuit of their aspirations (Adger et al. 2002; Babulo et al. 2008; Brown et al. 2006; Mushongah and Scoones 2012). The realised outcomes will depend on the context bordering the social and institutional factors, either formal or informal, that govern access, use, and control of resources (Scoones 1998). Studies have therefore employed this approach to study trends in livelihoods and identify gaps requiring support to improve the conditions in which people live. This is done by examining changes in various capitals, assets, and incomes that people have and earn from their livelihoods over time (Pritchard et al. 2017). However, the approach has been criticised for lacking flexibility and ignoring power relations and particularly failing to provide answers about the process of livelihood change (Mushongah 2009; Pritchard et al. 2017). In turn, different facets have been added to better understand longitudinal changes in livelihoods within the context of culture, gender and social differentiation (Scoones 2009). The complexity of studying fluid livelihoods remains with others, such as Bagchi et al. (1998), arguing that livelihoods may be stressed and become vulnerable such that their resilience is tested, hence requiring an understanding of how households adapt their livelihoods as their environment

changes. In their paper, Bagchi et al. (1998) concludes that there are conceptual and methodological challenges inherent in operationalising studies of livelihood change.

With the same logic, authors such as Dorward (2009) have construed development as a process of change involving three steps of livelihood trajectories over time. Here, a trajectory means "a path through time", and livelihood trajectories refer to "the consequences of the changing ways in which individuals construct a livelihood over time" (Bagchi et al. 1998, 457). The assumption in this schema is that households possess an initial stock of assets or capital that they use to drive their livelihoods, and depending on their outcomes, they become positioned into different livelihood landscapes over time (Pritchard et al. 2017). The steps include stepping up livelihood activities through investments that expand existing assets and increase their productivity; stepping out into alternative or new ventures that promise better returns; and hanging in their livelihoods to merely survive, maintain and protect current levels of wealth. In applying this framework in Zimbabwe, Mushongah (2009) added the category of dropping out to characterise destitute households, with no stable livelihoods, that rely on external support such as social protection programmes. As we will explain in detail below, we applied this framework in this paper following households preoccupied with agricultural livelihoods. We, however, expand the framework to include the category of stepping-in to account for households that were initially (at baseline) not in agriculture, our livelihood of interest but in subsequent surveys reported agricultural incomes. This is consistent with the observation by Pritchard et al. (2017) that the Dorward (2009) framework does not recognise that livelihood starting points may be different for different households.

Previous studies have approached the categorisation of households into livelihood strategies in different ways. For instance, Mushongah and Scoones (2012), using the Dorward (2009) framework, employed participatory wealth ranking in Zimbabwe to categorise households into different livelihoods, with richer being number one and poorer being number four. Household characteristics in the different ranks were found to be consistent with survey data and in-depth biographical interviews on average. Likewise, Pritchard et al. (2017) studied the effect of land ownership on livelihoods pathway and applied the Dorward (2009) formulation to categorise households into those "going backwards/muddling through" defined by food insecurity, "hanging-in" for those without any viable existence, and "getting ahead" signified by investments in land and education. Relatedly, Sabates-wheeler et al. (2018) measured sustainable livelihood change in the context of a social protection programme in Rwanda and categorised households into improvers, decliners, crashing-out and late improvers using a combination of indicators on food security and basic needs, total livestock units, and asset index. Others such as Xu et al. (2015) used cross-sectional data to categorise households into livelihood strategies based on the share of agricultural income in China: less than 20 percent were less dependent on agriculture, 20–40 percent were considered moderately dependent, 40–60 percent were highly dependent, and more than 60 percent were considered extremely dependent on agriculture. The fact that there is no global justification for the specific cut-off points is a problem also inherent in studies on asset thresholds, as Carter and Barrett (2006) explains. Furthermore, the literature on asset approaches, including asset accumulation, thresholds and asset poverty traps, has been used to measure changes in livelihoods over time (Carter and Barrett 2006; Giesbert and Schindler 2010; Orr et al. 2009). Therefore, the methods adopted in this study mirror these approaches used in different contexts.

3. Research methods

3.1 Data sources

This study uses two-period panel data to assess the determinants of livelihood trajectories. The first wave of data was collected in 2006/07 as part of the Farm Input Subsidy Programme[1] (FISP) evaluation by the School of Oriental and African Studies (SOAS). We used a subset of the data for Mchinji and Ntchisi districts in central Malawi with 240 households. The districts were selected because they produce most of the groundnuts in Malawi, a cash crop that has been key in the recent past but also riddled with aflatoxin management issues (Matita et al. 2018). The study tracked 210 original

households interviewing the head or their spouse representing an attrition rate of 12.5 percent which compares favourably with other longitudinal studies (Thomas et al. 2012). Most attrite cases were a result of death and failure to trace households, especially in new locations. There were no significant differences between households that attrite and those with complete information at baseline except for household size. Households with complete information were on average with an equivalent of five adults relative to 3.7 adults in attrite households ($p < .01$). Additionally, we interviewed 303 branching-off members aged above 18 years who have since moved on to form their own households and pursue independent livelihood activities. A total sample of 358 households with complete data on variables of interest was used in the analysis.

3.2 Mapping livelihood trajectories

This study used differences in the main livelihood characteristics between the two data collection points to map the households into different livelihood trajectories. We considered both farm- and nonfarm-related livelihoods given the literature suggesting that households tend to diversify their income sources (Barrett et al. 2001; Ellis et al. 2003; Mushongah and Scoones 2012). Evidently, the data showed that households obtained income from various sources, including agricultural sales, wage labour (commonly called *ganyu*), salary employment, businesses, and other income sources, such as social cash transfers and remittances. Unlike poor households, wealthier households in the sample had diverse income sources.

The identification strategy detailed in Table 1 was used to classify the households into livelihood trajectories. The livelihood trajectories show households that either moved from farm livelihoods into nonfarm livelihoods (step out and drop out categories) or remained in farming livelihoods (step up and hang in categories). Several modifications to determine suitable classification criteria were made upon iterative discussions and reflection by the team of researchers and review of relevant literature (Carter and Barrett 2006; Mushongah and Scoones 2012; Orr et al. 2009; Sabates-wheeler et al. 2018; Xu et al. 2015). First, households' main income sources at baseline in 2007 and in 2018 were identified. We calculated the share of different income sources to household total income for each year. The income source with the highest share was regarded as the main income source for the household in the reference year.

Second, the diversity of income sources for a household were considered. On average, households reported approximately two sources of income. A household with diverse income sources was defined as one whose total number of income sources in 2018 was greater than that in 2007. Approximately 36 and 45 percent of the original and branching-off households, respectively, were on average diverse in their income sources. The diversification of income sources is widespread among smallholder farmers in many African contexts as a response to risk exposure (Barrett et al. 2001) as well as to maximise complementarities across ventures for positive outcomes in food security and poverty (Zereyesus et al. 2017).

Table 1. Identification of Livelihood Trajectories.

Trajectory	Identification Criteria
Stepping Out	Households whose greater proportion of income was agricultural sales in 2007 but it is nonfarm sources of income in 2018; and they rely on salary or business income as their main sources.
Dropping Out	Households whose main source of income was agricultural sales in 2007 but in 2018 they rely on wage income (*ganyu*) or other income sources [includes social cash transfers and remittances]
Stepping Up	Households whose main source of income was agricultural sales in 2007 but have expanded and diversified; and their main source of income remains agricultural sales in 2018. Their calculated farm income change is greater than or equal to 25 percent
Hanging In	Households whose main source of income was agricultural sales in 2007 but have not expanded/diversified and their main source of income remains agricultural sales in 2018 but are not on social cash transfers. Their calculated farm income change is less than 25 percent
Stepping In	Households whose agricultural sales income in 2007 was zero; their main source of income was not agricultural sales in 2007 but in 2018 they reported income from agricultural sales. They are not on social cash transfer programme.

Third, the expansion of investments in agricultural enterprises was gauged by the proportional change in agricultural income to capture growth over the two periods. The proportional change was calculated as $(Yt_1\text{-}Yt_0)/yt_0 * 100$, where Y is the share in agriculture sales incomes. Households that expand their investments in productive agricultural assets are expected to increase their returns in agriculture, *ceteris paribus*. Several scenarios were possible: negative change in farm income; no change in farm income; change in farm income that is greater than zero.

Fourth, some households that were not engaged in agriculture in 2007 reported agricultural income in 2018. To cater to this category, another livelihood trajectory of "stepping-in" was introduced. Thus, the zero income values in 2007 were considered valid representations of household agriculture income at that time. Using this procedure, we were able to classify a substantial number of the households into livelihood trajectories, for example, 84 percent of the original households. Only 13 households were found to have stepped out of agriculture; these were removed in subsequent econometric analysis due to the small sample size. Suffice to say these are households earning income away from agriculture. A similar procedure was followed to classify livelihood trajectories of branching-off households but using 2007 values of their original households as the baseline values.

4. Estimation strategy

A multinomial logit model was used to estimate the determinants of livelihood trajectories, consistent with other literature (Brown et al. 2011; Paudel et al. 2018; Rahman and Akter 2014; Woodridge 2010). The probability that household *i* falls in livelihood trajectory *j*, which takes values of 1, … ,4 representing households dropping out, stepping up, hanging in and stepping in agriculture, is presented as follows.

$$p(y)_{ij} = \frac{\exp\left(w_i^{'} y_j\right)}{\sum \exp(w_i^{'} y_k)} \tag{1}$$

where *y* is the outcome of interest-livelihood trajectory. y_k is the vector of parameters corresponding to the *kth* option. *w* is the vector of exogenous factors that affect livelihood trajectories. We categorised these factors into household characteristics (age, sex, marital status of household head, maximum years of education in the household, household size defined by adult equivalent scales); economic and household assets (livestock units owned, value of durable assets and land); social infrastructure (participation by any household member in farmer clubs, resident agricultural extension agent in village); beneficiary of the FISP, and district effects. The household crop commercialisation index was measured as the proportion of crop sales from production where the higher the index, the more commercialised the household. The analysis also used indicators obtained in 2007 to capture the initial conditions that matter for livelihood pathways. A distinction was also made between original and branching-off households. The selection of these variables was based on the literature that indicates they affect household livelihood strategies (Banerjee et al. 2015; Ellis 2000; Mushongah and Scoones 2012; Pritchard et al. 2017; Rahman and Akter 2014; Sabates-wheeler et al. 2018).

5. Results and discussion

5.1 Characteristics of households in different livelihood trajectories

Table 2 describes the characteristics of households in different livelihood trajectories. Overall, 87 percent of households were male headed with an average age of 41 years in 2018. The maximum years of education in a household is 8, which corresponds to the completion of primary education. Households in the stepping-in category had significantly more years of schooling than those stepping-up. All households except those dropping out of agriculture sold at least half of what was produced in 2018, with an average of 62 percent. This is a rise from the 30 percent estimated for 2007. The trend shows that irrespective of livelihood trajectory, households sold some of their agricultural produce.

Table 2. Characteristics of households in different livelihood trajectories.

	Whole sample				Drop-out		Step-up		Hang-in		Step-in		
Variable	Mean	SD	Min	Max	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Wald Test
Male headed household 2018 (0/1)	0.87	0.34	0	1	0.76	0.43	0.90	0.30	0.90	0.30	0.86	0.35	4.57
Age household head in years 2018	41.1	16.5	17	89	46.02	20.2	40.4	17.3	41.2	16.0	39.8	15.1	3.52
Maximum years of education 2018	8.30	3.48	0	23	7.63	4.09	7.27	2.31	8.50	3.73	8.78	3.41	15.13***
Adult equivalent scales 2018	4.25	2.42	1	15	4.11	2.20	4.34	1.83	4.21	1.88	4.29	3.06	0.38
Adult equivalent scales 2007	5.04	2.14	1	13	5.11	2.30	4.75	1.97	5.23	2.18	4.99	2.15	2.34
Commercialisation index 2018	62.4	32.7	0	100	33.91	35.1	68.99	26.3	63.9	33.0	66.7	30.1	33.31***
Commercialisation index 2007	29.7	40.6	0	100	19.58	34.3	39.9	44.7	30.7	39.5	27.4	40.7	7.08*
Hired agricultural labour 2018 (0/1)	0.30	0.46	0	1	0.24	0.43	0.18	0.39	0.32	0.47	0.35	0.48	7.85**
Hired agricultural labour 2007 (0/1)	0.19	0.39	0	1	0.32	0.47	0.15	0.36	0.20	0.40	0.15	0.36	5.18
Total Livestock Units 2018	0.63	1.56	0	18	0.18	0.41	0.69	1.90	0.58	1.38	0.77	1.74	20.43***
Total Livestock Units 2007	0.65	1.85	0	22	0.52	1.01	0.48	0.57	0.78	2.20	0.65	2.08	2.45
Log land (hectares) 2018	0.87	0.73	0	4	0.66	0.45	0.79	0.38	0.81	0.62	1.01	0.94	11.06***
Log land (hectares) 2007	1.05	0.47	0	3	1.04	0.49	1.00	0.37	1.13	0.51	1.00	0.45	5.56
Number of cultivated crops 2018	3.11	1.65	0	11	2.05	1.34	3.08	1.55	3.25	1.77	3.32	1.57	28.34***
Number of cultivated crops 2007	2.36	1.17	1	6	2.39	1.34	2.23	0.98	2.42	1.28	2.37	1.11	1.22
Log value of durable asset (MK) 2018	3.59	1.95	0	10	2.88	1.61	3.36	1.81	3.53	1.62	3.95	2.28	11.91***
Log value of durable asset (MK) 2007	1.87	1.13	0	7	1.73	1.14	1.88	0.89	1.82	1.11	1.94	1.24	1.33
FISP Beneficiary 2018 (0/1)	0.08	0.28	0	1	0.02	0.16	0.05	0.22	0.10	0.30	0.10	0.30	6.68*
FISP Beneficiary 2007 (0/1)	0.55	0.50	0	1	0.59	0.50	0.48	0.50	0.61	0.49	0.53	0.50	3.35
Received any credit 2007 (0/1)	0.25	0.43	0	1	0.24	0.43	0.22	0.42	0.29	0.45	0.23	0.42	1.51
HH received any extension 2018 (0/1)	0.88	0.33	0	1	0.83	0.38	0.90	0.30	0.90	0.30	0.86	0.34	1.74
HH received any extension 2007 (0/1)	0.23	0.42	0	1	0.22	0.42	0.27	0.45	0.24	0.43	0.22	0.41	0.63
HH had member of farmer club 2018 (0/1)	0.14	0.35	0	1	0.02	0.16	0.10	0.30	0.14	0.34	0.20	0.40	19.7***
Residence in Mchinji (0/1)	0.46	0.50	0	1	0.41	0.50	0.32	0.47	0.57	0.50	0.43	0.50	11.85***
Original Household (0/1)	0.44	0.50	0	1	0.49	0.51	0.45	0.50	0.43	0.50	0.44	0.50	0.40
Number of observations	358				41		60		118		139		

Notes: The table presents the characteristics of households in different livelihood trajectories. Households in the stepping-out category were removed from the analysis due to the small sample size. 1 USD = MKW 732 (2018); MKW 140 (2007) (source Reserve Bank of Malawi). HH = household. (0/1) indicates dichotomous variable equal to 1 for the included category, otherwise equal to 0 for the base category. SD = standard deviation. The Wald test is based on a multivariate test for group differences in means across all livelihood trajectories with heterogeneous options. The statistic presented in the Wald test follows a chi-squared distribution. * $p < .10$, ** $p < .05$, *** $p < .01$.

Source: Computed by authors

The data show increasing access to extension services among the sample (23–88 percent) due to the rise in the number of agricultural extension providers apart from the government. Likewise, households in 2018 cultivated three crops compared to two crops in 2007. Hiring of agricultural labour was reported by 30 percent of the whole sample in 2018 compared with 19 percent in 2007. Among the whole sample, 14 percent of the households have at least one member that participates in farmer club activities, and a higher proportion (20 percent) is reported for stepping-in households possibly being new farmers they are keen to learn and build networks that can benefit their agriculture enterprise. District level differences exist, with significantly more households hanging in Mchinji (57 percent) relative to those stepping up (32 percent) than in Ntchisi district.

5.2 The effect of agricultural commercialisation on livelihood trajectories

Table 3 presents marginal effects for the different livelihood trajectories obtained from multinomial logit estimation. Overall, the model is statistically significant judging by the obtained likelihood ratio chi-squared statistic ($p < .01$), implying that we reject the hypothesis that all the parameter estimates are equal to zero. We also tested for Independence of Irrelevant Alternatives (IIA) using a Hausman test, which showed that the odds are independent of other alternatives. A parsimonious specification with only the independent variable obtained very similar results (Table A1).

We find a statistically significant positive relationship between household level of commercialisation in the current year (2018) and initial year (2007) and the odds of stepping up agricultural livelihoods. The

Table 3. Determinants of livelihood trajectories (marginal effects reported).

	Dropping -out	Stepping-up	Hanging-in	Stepping-in
Male headed household (0/1)	−0.054	−0.058	0.116	−0.004
Age in years of HH head	0.002*	−0.001	0.001	−0.002
HH is married (0/1)	−0.003	0.163	0.034	−0.195*
Maxi years of HH education	−0.003	−0.023***	0.012	0.014*
Adult Equivalents 2018	0.011	0.007	−0.014	−0.004
Adult Equivalents 2007	0.005	−0.006	0.010	−0.010
Hired Labour 2018 (0/1)	0.042	−0.125**	0.074	0.008
Hired Labour 2007 (0/1)	0.077*	0.011	0.055	−0.143**
Total Livestock Units 2018	−0.081*	0.035**	0.008	0.039
Total Livestock Units 2007	0.006	−0.033	0.031*	−0.005
Log land 2018	0.034	−0.009	−0.070	0.045
Log land 2007	−0.004	0.031	0.096	−0.123*
No. of crops cultivated 2018	−0.048***	−0.013	0.041**	0.020
No. of crops cultivated 2007	0.013	−0.058**	−0.024	0.069**
Log value durable assets 2018	0.007	0.011	−0.023	0.005
Log value durable assets 2007	−0.028	0.038*	−0.061**	0.051*
FISP beneficiary 2018 (0/1)	−0.099	−0.104	0.092	0.111
FISP beneficiary 2007(0/1)	−0.020	−0.046	0.078	−0.013
Obtained credit 2018 (0/1)	−0.011	−0.017	−0.013	0.041
Obtained credit 2007 (0/1)	0.023	−0.043	0.036	−0.016
Received any extension 2018 (0/1)	0.036	0.039	0.098	−0.172**
Received any extension 2007 (0/1)	0.048	0.070	−0.093	−0.025
Lead farmer in community (0/1)	−0.029	−0.047	0.046	0.029
HH has club member 2018 (0/1)	−0.110	−0.046	0.030	0.126
Commercilisation Index 2018	−0.002***	0.002***	−0.000	0.000
Commercilisation Index 2007	−0.001	0.001**	0.001	−0.002*
Residence in Mchinji (0/1)	−0.055	−0.101**	0.214***	−0.058
Original HH (0/1)	0.053	−0.038	−0.018	0.002
Pseudo R-squared		0.1777		
Probability > Chi-squared		0.0000		
Loglikelihood -Ratio Chi-squared		162.90		
Number of observations		358		

Notes: The table shows marginal effects for different livelihood trajectories. Stepping-in was used as the base category in the model estimation. Households in the stepping-out category were removed from the analysis due to the small sample size. (0/1) indicates dichotomous variables for the stated category equal to 1, otherwise equal to 0 for the base category. Standard errors in parentheses. * $p < .10$, ** $p < .05$, *** $p < .01$.

odds of stepping up increased by 0.2 percent with commercialisation in 2018 ($p < .01$) and by 0.1 percent with commercialisation in 2007 ($p < .05$). In addition, the results indicate that commercialisation in the current year makes dropping out less likely by a margin of 0.002. We also find that initial crop marketing in 2007 weakly ($p < .10$) reduces the chance of entering agricultural livelihoods by 0.2 percent. This may be explained by the tendency of households that do well in commercialisation to invest their proceeds in the education of children who are less likely to take up agricultural livelihoods.

While we find that commercialisation is important for livelihood pathways, the margins realised are very small. A more vivid illustration with predicted marginal effects plots is presented in Figure 1.

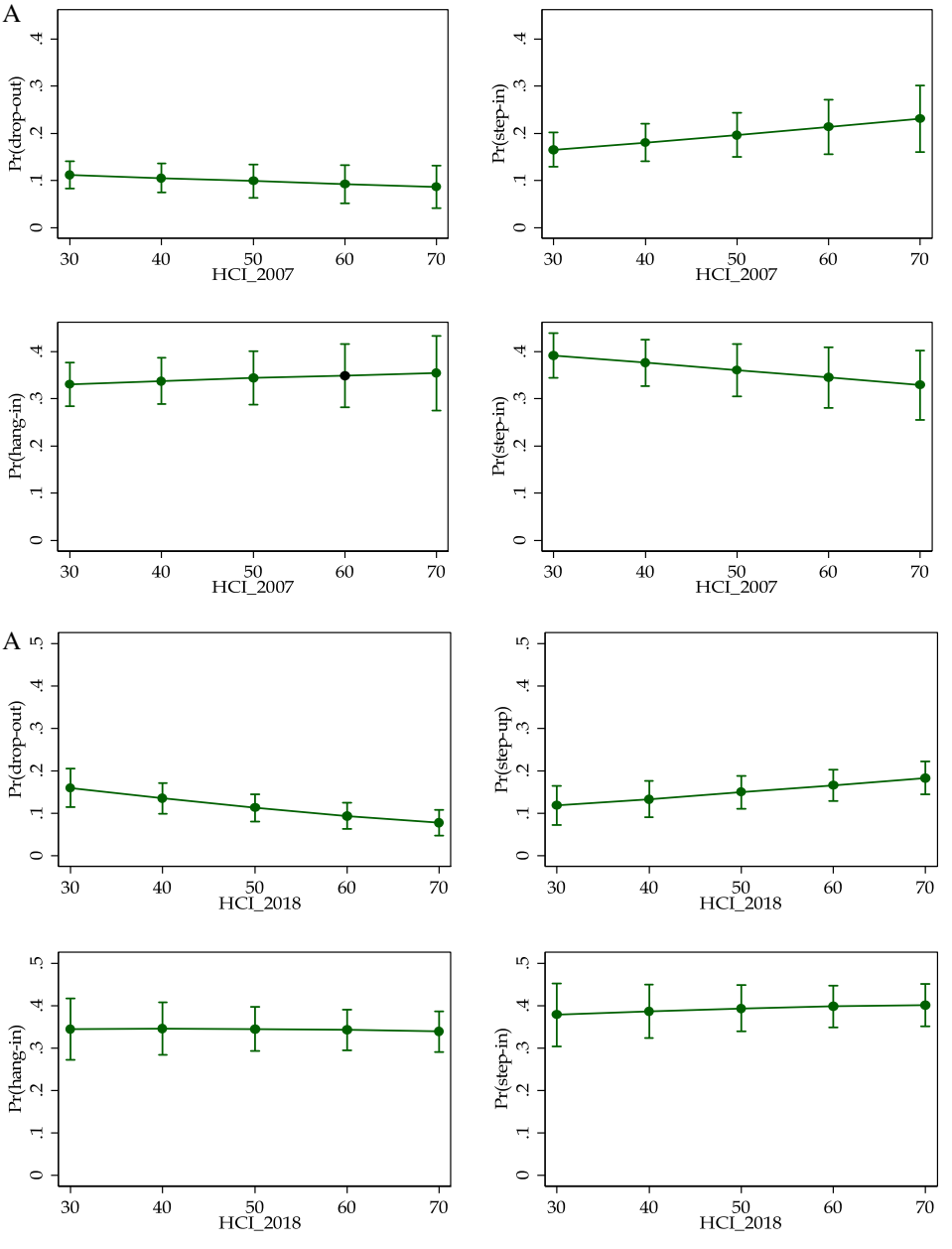

Figure 1. Predictive marginal effects of commercialisation on livelihood trajectories with 95 percent confidence intervals.

While the odds of dropping out decline with increasing commercialisation, the odds of hanging in appear the same irrespective of level of commercialisation. The odds of stepping up increase with increasing commercialisation, but the increase appears to be greater with initial commercialisation in 2007 than with current levels in 2018. The graphs further show that the stepping-in category declines with increasing commercialisation in 2007 but is largely constant with commercialisation in 2018. This may well reflect the levels of farmer integration in markets that remain weak, exploitative, and rudimentary in Malawi (Chimombo et al. 2022; Chinsinga and Matita 2021).

Other findings on initial characteristics show that land holding by the original household in 2007 reduces the odds of going into agriculture by approximately 12.3 percent. Initial durable assets, however, increase the odds of stepping up and stepping in by 3.8 and 5.1 percent, respectively. Furthermore, a unit increase in the value of initial durable assets makes hanging in less likely by 6.1 percent, emphasising the positive role of initial assets in livelihoods. Nevertheless, the results show no significant relationship between 2018 land and durable asset holding and livelihood paths.

The study finds different influences of crop diversification on livelihood trajectories. The possibility of dropping out decreases by 4.8 percent, while the odds of hanging in increased by 4.1 percent with an increasing number of crops cultivated in 2018. Again, placement in stepping up trajectories is less likely by 5.8 percent with an increasing initial number of crops cultivated in 2007, although this experience with diverse crop cultivation helped households step into farming livelihoods. Location effects were also evident, with hanging-in being more likely in Mchinji district relative to Ntchisi. In addition, stepping up was less likely in Mchinji district, reflecting location differences in infrastructure and market development. There was no association between being an original or branching-off household and the observed livelihood trajectory.

6. Discussion and conclusion

Improving livelihood pathways among smallholder farmers engaged in agriculture is crucial for sustaining household welfare and reducing widespread poverty in Malawi. We found a clear association between commercialisation and livelihood trajectories in central Malawi. Our findings suggest that commercialized households are less likely to drop out of agricultural livelihoods and that initial commercialisation spurs investment in agriculture, making households step up their livelihoods. These findings corroborate evidence about positive outcomes from increasing commercialisation (Carletto et al. 2017; Ogutu and Qaim 2019; Radchenko and Corral 2018). However, worrisome is the finding that some households are hanging in their livelihoods irrespective of the extent of commercialisation, pointing to its failure to sustainably provide poverty escapes to households.

We found that the initial stock of land holding among original households matters for livelihood trajectories. This is critical for stepping-in households whose original households may have inadequate land to secure land entitlement to the next generation, thereby affecting livelihood paths. In this setting, land is owned on a customary basis and inherited through family lineage, which has increased land fragmentation, tenure insecurity and reduced holding sizes, fuelling difficulties to step into agriculture (Jayne et al. 2014; Leavy and Hossain 2014). This is particularly problematic where land markets remain small and weak, although there has been increasing commodification of land over the years in rural Malawi. Similarly, initial assets drive households to step up their agriculture and make it less likely to hang in, suggesting the importance of asset accumulation in supporting livelihoods, as found elsewhere (Hidrobo et al. 2018; Janvry and Sadoulet 2000; Sabates-wheeler et al. 2018).

Our results suggest that crop diversification may not attain the same results for smallholder farmers in different livelihood paths. For households, hanging-in and on the verge of dropping out crop diversification offers advantages in terms of diverse production, consumption and marketing as well as aiding adaptation to climate change (Dillon et al. 2015; Kankwamba et al. 2018; Tongruksawattana 2014). However, crop diversification seems to fail to match household resources and production capacity because it demands investments in inputs as well as farming skills. Moreover,

where resources are spread thinly, households may be locked in a vicious cycle of low input use and output (Chirwa and Dorward 2013; Dorward 2009; Dorward and Chirwa 2011), aggravated by entrenched poverty. Additionally, the efficiency gains that come with specialisation may be lost, thereby making hanging in a likely outcome of agricultural livelihoods. Nonetheless, initial crop diversification provides prior experience that reduces barriers to entry into agricultural livelihoods. Such experience coupled with access to useful extension in the current period could facilitate stepping into agriculture, especially for young farmers who are often left out of extension services and receive disproportionally fewer services than adult farmers (Ragasa and Niu 2017).

The study is not without limitations. As recognised by many studies before this (Alkire and Santos 2014; Carter and Barrett 2006), the use of arbitrary cut-offs and thresholds is contentious. This assessment makes use of proportional change in agricultural income cut-offs to place households in stepping-up and hanging-in categories. It is possible that setting the proportional changes in agricultural income at more than the 25 percent used, many other households would fall under the hanging-in category and not necessarily step up. Nonetheless, we adopted a transparent measure that can be replicated and verified in different contexts. In addition, we use this variable in combination with other characteristics of the household, such as income diversification and participation in social assistance programmes, therefore accounting for a set of variables in the placement into livelihood trajectories. Furthermore, we are mindful that the absolute income from agriculture may be lower over the years, but the proportional change may be the same or higher due to a considerable decline in other income sources. The shortcomings notwithstanding, this study highlights important insights into the drivers of livelihood trajectories among smallholder farmers engaged in agriculture and an area not previously studied.

In conclusion, this study found that the factors driving rural livelihood trajectories are not the same for farmers in different pathways. Crop commercialisation over time coupled with significant asset accumulation facilitates investments and expansion of agricultural enterprises (stepping up). However, some households tend to hang in and barely survive despite their participation in markets, suggesting that smallholder commercialisation in rural Malawi may not be robust enough to lead to sustainable poverty escapes. With respect to this, initial conditions are an important precursor for livelihood pathways. Addressing challenges in accessing land, extension services and other inputs would ease the entry of young farmers into meaningful agriculture. Additionally, the finding that crop diversification prevents households from dropping out of agriculture but does not prevent hanging-in status highlights why previous blanket recommendations to farmers to diversify crop production, without taking into consideration their contextual differences, have not delivered the same benefits to all farmers. Overall, the study underscores the complex nature of smallholder commercialisation in Malawi and similar contexts, revealing the need to ensure that policy interventions are systematically tailored to the different categories of smallholder farmers.

Note

1. For details on the FISP programme refer Chirwa and Dorward (2013)

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Ethical considerations

Participants provided informed consent prior to interviews. Ethical approval was provided by the Malawi's National Committee on Research Ethics on Social Sciences and Humanities in Malawi (NO P.08/18/301).

Data availability

Data can be provided upon request to mirriammatita@gmail.com

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Appendix

Table A1. Determinant of livelihood trajectories from parsimonious model.

	Dropping -out	Stepping-up	Hanging-in	Stepping-in
Maxi. years of education in HH 2018	−0.003	−0.017***	0.007	0.013*
Hired labour 2018 (0/1)	0.027	−0.092*	0.023	0.041
Number of crops cultivated 2018	−0.044***	−0.003	0.021	0.026*
Number of crops cultivated 2007	0.018	−0.062**	0.006	0.037
Log value of durable assets 2007	−0.012	0.011	−0.019	0.020
HH commercilisation index 2018	−0.002***	0.001**	−0.000	0.001
Commercilisation index 2007	−0.001**	0.002***	0.000	−0.001
Residence in Mchinji (0/1)	−0.040	−0.076*	0.167***	−0.052
Pseudo R-squared	0.1008			
Probability > Chi-squared	0.0000			
Loglikelihood -Ratio Chi-squared		92.44		
Number of observations		358		

Notes: The table shows marginal effects for different livelihood trajectories. This is a parsimonious model with only independent variables identified after the estimation results presented in Table 3. The obtained results are consistent. Stepping-in was used as the base category in the model estimation. Households in the stepping-out category were removed from the analysis due to the small sample size. (0/1) indicates dichotomous variables for the stated category equal to 1, otherwise equal to 0 for the base category. Standard errors in parentheses. * $p < .10$, ** $p < .05$, *** $p < .01$. The Hausman test of Independence of Irrelevant Alternatives (IIA) shows that the odds are independent of other alternatives.