Decent rural employment in different farming systems in Sub-Saharan Africa

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Outline

Introduction

Decent rural employment and different farming systems

Stochastic Distance Function

- Data and Empirical model

Results and Conclusion

Introduction

- Poverty is often related to a lack of productive employment in agriculture and poor performance of the rural non-farm economy (Haggblade et al, 2010; FAO, 2012)

- Focus on quality of employment for:
  - Productivity, living standards, social justice and sustainable development (Anker et al, 2002; Ghai, 2002; Vandenberg, 2004; Buchanan, 2006; Evans and Gibb, 2009; Dorward, 2013; Burchell et al, 2014)

- Problems with data availability and definition

- Tanzania and Ethiopia
  - Living Standards Measurement Study (LSMS) 2010-2011.

How does decent rural employment influence efficiency of the farm household across different production systems?

Decent rural emplyoment

The ILO defines decent work as “opportunities for women and men to obtain decent and productive work in conditions of freedom, equity, security and human dignity” (International Labour Organization, 1999).

In FAO’s definition, rural employment refers to any activity, occupation, work, business or service performed for pay or profit by women and men, adults and youth, in rural areas. It applies to waged and salaried workers as well as self-employed workers (including contributing family workers).

Four pillars:

1. employment creation and enterprise development
2. social protection
3. standards and rights at work
4. Governance and social dialogue

Decent work in our study

Pillar of decent work	Indicators used	Measurement	Expected sign
Pillar1: Employment creation	Employment to total workforce ratio*	Proportion of employed HH members to total HH workforce available	+ve
Pillar 2: Social protection	Share of government transfer to income *	Total transfer from government and NGOs or PSNP in Ethiopian Birr and Tanzanian Shilling from the total income	+ve(-ve)
	Informal transfers to total income‡	Total informal cash, food and in-kind transfers in Ethiopian Birr from the total income	+ve(-ve)
Pillar 3: Standards and rights at work	Child labour ratio†	Proportion of child labour from the total labour used for agriculture activities by the HH	-ve
	Precarious employment ratio*	Proportion of HH seasonal and casual labour from the total HH agricultural workforce	-ve

[1] Child labour ratio as an indicator is used only for Tanzania due to low response rates in Ethiopia.

Farming systems

Farming systems as “a population of individual farm systems that have broadly similar resource bases, enterprise patterns, household livelihoods and constraints, and for which similar development strategies and interventions would be appropriate” (Dixon et al., 2001).

3 broad categories

- crop based farming system
- livestock based farming system
- diversified farming system

Farming systems

Using different types of farms for the measurement of efficiency is not a new approach.

- Tzouvelekas et al. (2001) used a stochastic production frontier methodology and a translog functional specification to evaluate the efficiency across different farming systems, which was in their case conventional and organic olive farms in Greece.
- Bremmer et al. (2002) looked at conventional and organic farmers in Finland and found that the productivity in organic agriculture was lower in terms of capital, land and labour, relative to more conventional forms of farming.
- Sauer and Morrison-Paul (2013) used a latent class approach to divide a sample of Danish farms into three distinctive production systems. And Sauer et al. (2012) did a similar analysis for Kosovo.

➢ All of these examples deal with labour as an input component, however, none of these papers distinguish among different kinds of labour and explicitly look at quality aspects of employment.

Research outline

1. identify different production systems and technologies for a sample of farms in the two countries using a latent class approach
2. We follow by estimating the efficiency of production for these various systems
3. investigate in how far decent rural employment indicators can explain different levels of inefficiencies for different production systems

- Stochastic Distance Function (SDF)
- The inefficiency, the amount by which the farm fails to reach the optimum (the frontier)
- a clustering procedure, in particular, a multivariate latent class model (LCM) can be applied to our stochastic frontier estimation procedure, as LCM is based on discrete unobserved variables

Latent classes

- Fitting the frontier to each latent class
  - Basis highest probability of belonging to the latent class

For Tanzania
- tropical livestock unit
- concentration index
- annual precipitation

➢ In Tanzania, we find a crop based production system and a diversified production system

For Ethiopia
- tropical livestock unit per adult labour equivalent of the household
- concentration index
- distance to the road

➢ In Ethiopia we find two diversified production systems, one with less tropical livestock, which can be seen as a more crop production oriented system, and a more diversified production system with more livestock activities.

Table 3: Summary statistics of the latent classes and the overall sample in Tanzania

Latent Class	Variable	Mean	Std.Dev	Minimum	Maximum	Cases
T1 crop based production system	Tropical livestock index	.151	.597	0.000	570.000	303
	Land	2.842	3.590	.0405	284.292	303
	Labour	155.425	141.278	240.000	887.000	303
	Concentration index	1.483	.468	.098	199.774	303
	Precarious Employment ratio	.074	.159	0.000	.872	303
	Employment to workforce ratio	.791	.290	0.000	1.000	303
	Child labour ratio	.065	.127	0.000	.612	303
T2 diversified production system	Tropical livestock index	2.672	7.866	0.000	118.800	628
	Land	3.607	5.811	.0445	655.307	628
	Labour	170.342	163.523	200.000	1236.40	628
	Concentration index	.860	.480	.032	199.615	628
	Precarious Employment ratio	.101	.180	0.000	.985	628
	Employment to workforce ratio	.817	.251	0.000	1.000	628
	Child labour ratio	.057	.115	0.000	.668	628
All	Tropical livestock index	1.840	6.561	0.000	118.800	931
	Land	3.338	5.199	.040	655.307	931
	Labour	164.360	156.718	200.000	1236.40	931
	Concentration index	1.064	.558	.003	199.774	931
	Precarious Employment ratio	.093	.174	0.000	.985	931
	Employment to workforce ratio	.808	.265	0.000	1.000	931
	Child labour ratio	.0596	.119	0.000	.668	931

Table 4: Summary statistics of the latent classes and the overall sample in Ethiopia

Latent Class	Variable	Mean	Std.Dev	Minimum	Maximum	Cases
E1 More crop production oriented	Tropical livestock index	4.594	3.390	.013	290.450	329
	Land	1.724	3.494	.085	416.813	329
	Labour	145.804	158.483	120.000	1194.00	329
	Concentration index	1.360	.550	.046	200.000	329
	Precarious Employment ratio	.030	.104	0.000	.995	
	Employment to workforce ratio	.819	.244	0.200	1.000	329
E2 more diversified production system	Tropical livestock index	6.489	4.849	.013	459.720	820
	Land	1.437	1.683	.0312	304.752	820
	Labour	125.886	156.980	100.000	1484.60	820
	Concentration index	.975	.550	.003	200.000	820
	Precarious Employment ratio	062	.161	.000	.992	820
	Employment to workforce ratio	.791	.256	0.111	1.000	
All	Tropical livestock index	5.946	4.560	.013	459.720	1149
	Land	1.519	2.350	.031	416.813	1149
	Labour	131.590	157.601	100.000	1484.60	1149
	Concentration index	1.085	.577	.003	200.000	1149
	Precarious Employment ratio	0.052	.148	.000	.995	1149
	Employment to workforce ratio	.799	.253	.111	1.000	1149

Results Tanzania

Inefficiency Determinants	Crop based		diversified	
Variable	Coefficient	Standard Error	Coefficient	Standard Error
Age of the household head	-.243	.200	.003	.003
Employment to workforce ratio	-6.301	6.189	.124	.154
Precarious employment ratio	21.234*	11.479	1.270***	.305
Precipitation of the wettest quarter	0.007	0.007	.0005	.0003
Age dependency ratio	-4.215	3.453	-.0486	.064
Women to total labour ratio	1.048	6.587	.162	.239
Distance to the major road	.0394	.050	.004**	.002
Sex of the household head	-7.666	7.023	-.228	.153
Household head literacy	-5.685	5.348	-.388***	.148
Region	-.609*	.366	-.019**	.009
Advisory service	-2.072	9.723	.0223	.226
Share of government transfer to income	-194.290	379.775	-37.893	21.014
Access to credit	-12.162	21.616	-.175	.378
Child labourer to total labour ratio	27.518	32.129	.812**	.413

Results Ethiopia

Inefficiency Determinants	More crop oriented		More diversified	
Variable	Coefficient	Standard Error	Coefficient	Standard Error
Age of the household head	-.005	.006	.003	.003
Employment to workforce ratio	-.719**	.369	-.294	.190
Precarious employment ratio	1.036**	.511	1.499***	.297
Annual precipitation	-.002*	.001	-.001	.001
Precipitation of wettest quarter	.002*	.001	.001	.001
Age dependency ratio	-.111	.097	-.012	.061
Women to total labour ratio	.062	.408	.266	.274
Distance to the major road	.000	.005	.006**	.003
Sex of the household head	-.209	.312	-.257	.222
Household head literacy	-.299*	.172	-.332***	.117
Region	.075**	.034	.033	.020
Advisory service	.247	.170	-.127	.121
Share of informal transfers to income	-.634	.887	-1.181***	.260
Access to credit	-.274	.195	-.157	.135
Share of government transfer to income	-2.300	2.400	-5.242*	3.005

Summary and Conclusion

In Tanzania, we observe a clear cut distinction between a specialised crop production system and a diversified production system. In Ethiopia, two different diversified production systems can be found: a more diversified production system and a less diversified production system

NOTE: diversification refers exclusively to on-farm diversification, and that we leave to future research to deepen the implications in terms of off-farm diversification.

It appears that decent rural employment deficits in the agriculture sector of developing countries could be better addressed if these countries implement production system oriented employment policies and strategies

Questions